



User Manual

Flexible Table Generation
Standard Table Management
ICE Key-System
ICEcalc – Spreadsheet

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1 Introduction

1.1 The information system ICE

ICE stands for Information, Controlling, Entscheidung (in English: Information, Controlling, Decision). It is a web-based information system, developed to support higher education policy decision making. The back-end of the system is a data warehouse, in which data of various structures can be saved. Both, individual data and aggregated data can be stored. You can search through the data via the ICE-application server. The main analysis tool is the *flexible table generation* that provides interactive compiling of user-defined tables out of the existing data stocks. Furthermore, tables created with the flexible table generation can be saved as so-called *standard tables* that can be updated automatically, after more recent data stocks have been imported.

History

The debate on protection of personal data which arose in the 1980s led to increasing sensitivity in the population regarding data protection questions and to stricter data protection rules. Both resulted in fewer possibilities of statistical data analysis being allowed: In many fields, statistical analyses can only make use of so-called aggregated datasets. The ICE information system provides a solution that is capable of extracting a maximum of information from aggregated datasets (that are basically limited). Simultaneously the system allows the analysis of individual data records.

At the start of the 1990s, ICE evolved as a commissioned project on behalf of the Federal Ministry of Education and Science (BMBW), which later merged with the Federal Ministry of Research and Technology (BMTF) to form the Federal Ministry of Education and Research (BMBF). After the ministry converted its operating system from Macintosh to MS Windows, a redevelopment of the ICE system became necessary, in the mid 1990s. An intranet system was developed based on a modern multi-level architecture, with a database at the backend and Java as its central development platform. Thus the system became platform independent and accessible with an Internet browser.

At present, the following institutions use information systems that derive from the ICE base technology that was developed by HIS on behalf of the BMBF:

- BMBF: StaGuS – information system of the BMBF
- Federal states: ICEland – joint information system of all German federal states and of the German Science Council
- DAAD: ICEww – information system of the Wissenschaft weltoffen project

- MWK Nds: ICEnds – information system of the state-specific information demand of the federal state Lower Saxony

1.2 System characteristics outline

Web-application. An ICE installation can be accessed via a network using a Java capable web browser (such as the open source browser Mozilla Firefox or MS Internet Explorer). In principle, this means that the system can be accessed from any computer on the Internet or intranet which is registered with the ICE server. Access to the system (or to parts of it) can be restricted to authenticated users as required. Where necessary, the system (or parts of it, e.g. libraries of standard tables) can be set up to allow access from the Internet.

Platform independence. On server-side, the system can be installed under MS Windows as well as under Unix (Solaris) and Linux. The client end (the user) only needs a Java capable web browser. Browsers are available free of charge for all common platforms (such as MS Windows, MacOS, Linux). The system is also independent in terms of the relational database management system that is chosen: There are installations under commercial databases (like Oracle, Informix) as well as under open source databases (such as MySQL). We are currently testing the use of the open source database PostgreSQL.

Flexible data import. Data with any structure and depth of structure can be imported. The system can also be expanded to include new topics. It is possible to analyse and interpret aggregated data as well as large sets of individual data with good performance. Similarly, the combined analysis of aggregated and individual data is possible.

Flexible data analysis. The flexible import of data stocks comes along with an equally flexible range of analysis and interpretation modules. The so-called flexible table generation is a tool that can extract any needed parts of the existing data stocks into tables. Analysis using data from various data stocks can easily be done: It is no problem to combine information from several data stocks in a single results table.

Flexible data export. Users can choose among several output formats for their research results: XML, (X)HTML, MS Excel, Gnumeric, FOP, PDF. In the background the output is carried out as ICE-Publishing-Framework that is based on Apache Cocoon. The system is based upon XML. XML is a standard which can be used for data exchange and as a universal interface to third party programs (e.g. other databases, spread sheets, graphics programmes, geographical information systems, etc.). By use of XSLT-stylesheets XML-streams will be transformed into the further destined formats. If required, other formats (e.g. L^AT_EX) can be provided easily by the generation of other XSLT-stylesheets. This procedure allows some modifications to the layout (colours, document size, fonts, etc.) for all outputs of

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an ICE-installation. This can easily be done, because, when called, all outputs are generated on-the-fly, with all information extracted directly out of the database, and there is no need to access prefixed data files. There is an extra user interface for the often used PDF-format. This interface allows to modify the body structure of single PDF-files (e.g. column and preceding column width, line height, paper size, etc.).

Data harmonisation with an integrated key. All data contained in the system are encoded with a uniform ICE-key. The project team centrally updates and hosts the key-system. In this way it is made possible to analyse various data stocks at once, and those may even be provided by different sources – on condition that contents allow meaningful comparisons among these data stocks. If necessary equivalency rules are getting defined which enable to compare attributes that are differently encoded but comparable regarding contents (example: subject groups of staff statistics compared with subject groups of student statistics). The system includes key internal hierarchies that are very helpful for users, e.g. at sorting functions. (The system "knows" that the University of Hanover belongs to the state Lower Saxony and to the higher education institution type "university").

ICE-standard tables (with integrated automatic updating). All results tables produced with the flexible table generation can be stored as so-called ICE-*standard tables* in *standard table libraries*. These table libraries can also be made accessible to third parties via intranet or Internet, and can be searched both by a hierarchical directory structure as well as by a keyword search. The integrated automatic update function is a particularly useful feature of ICE-standard tables: A generated table that has been saved as standard table can automatically be updated at the touch of a button with new supplied data. The user can choose from various update options (e.g. time series addition, time series shift, substitution of the whole table with the latest available data). The ICE-Publishing-Framework allows to access these standard tables in all those formats mentioned above.

Performance/high-availability. To ensure a good system performance and high-availability, it is possible to install the ICE-system on a computer-cluster. So user inquiries can be handled by any number of servers and not by a single one. The ICE cluster system runs upon software by the open source High-Availability Linux Project and uses, among other things, its techniques of load balancing. All important components of an ICE installation (data-warehouse, application server, load-balancer, etc.) are provided redundantly to secure high-availability. By adding further server nodes, the system can be gauged in any required way and be suited to increasing user applications. At present, the ICE-installation of the German federal states (ICEland) runs on a total of eight multiprocessor servers, with four dedicated to user requests.

Support/hotline. The ICE-project group of HIS (Higher Education Information System) advices on all questions related to the information system (via e-mail as well as via

1 Introduction

phone). Besides technical questions (like network problems or security settings) and questions concerning software-handling (browser, ICE-software), this includes specialist/statistical questions (concerning data and their analysis, key-questions, or the like). For users of ICE-installations that are operated by HIS, this service is free of charge.

Continuing progress. The ICE-system lies under constant progression. Enhancements and optimisations that are done by the ICE-project group for a client, will be provided promptly for the general public.

ICE is going to be free software/open source. Endeavours are being made to provide the source code of all ICE-components as free software under open source license (GPL) for the general public. This would allow anyone to use the ICE-system for any means, to study it, to modify it, and to publish it in its original or derivative version. The GPL allows anyone the following four permissions as integral part of the license:

1. The work can be used for any means and without any restrictions. This explicitly includes commercial purposes.
2. The work can be copied and redistributed free of charge or for a fee, and the source code must be accompanied. The recipient must get the same permissions e.g. anybody who gets a copy for a fee is authorised to publish it for commercial purposes or for free. A license fee is not allowed. Nobody is committed to distribute copies, neither in general, nor to a specific person but if a copy is distributed, then it must be under this rules.
3. The operating principles of a work are free for studying, and it is legal to modify it to one's own needs.
4. Even the derivative version of a work correspondent to Permission 3 can be distributed under the conditions of Permission 2, and the modified source code must be accompanied. Nobody is committed to distribute derivative copies, but if a derivative copy is distributed, then it must be under the rules of Permission 2.

1.3 The use of this manual

This manual is designed to assist you at using the information system ICE. It provides instructions on selected parts of the system. The main focus is on

- the flexible table generation (available in three differing versions)
- the creation of standard tables and the standard table management
- how to use the ICE-key
- the handling of ICEcalc

1 Introduction

Many hints and advices are implemented in the system itself. This manual guides you through the most important system features. The functions of ICE are explained by how-to-do instructions, concrete examples, and hints.

To read this manual, you only need little technical skills. You solely should know how to use a web browser and some standard software. All other features of ICE will be explained step by step.

Terms that are specific to ICE, like key or keyword, mostly stand in *italics* (and in the underlines of figures in “double quotes”). Elements on your user interface, like buttons on your browser are printed **bold** (e.g. the **back** button of your browser). In this manual, the term “window” is used for separate (complete) elements on the user interface (e.g. your browser). For elements within a window, we use the term “fields”.

ICE uses an authentication system. When you come to an area with secure data, you have to authenticate yourself. Authentication is required only one time for the whole system. In this manual this is referred to at the concerning points.

The Higher Education Information System GmbH appreciates any remarks and suggestions that may help to improve the ICE system or this manual. Please send your comments to *ice@his.de*.

2 TabGen I – single data stock table generation

The first level of user defined table creation is the *single data stock table generation*. We call this *Table generation I* (or *TabGen I*).

What is a *single data stock*? Within the system it is a basic stock of data that belong together (e.g. a time series of enrolled students and new entrants, structured by certain *characteristics*). At *TabGen I*, you select a single data stock and create a table out of this stock's data. Handling with only one data stock has a special advantage: all system enquiries are well defined. Only those data get combined that really match one another. But compared to *multi data stock table generation*, this procedure is rather inflexible with regard to merging various individual data. For example you cannot compare staff data (staff groups, staff positions) with data concerning study demand (enrolled students, new entrants). The programme does not provide combinations like this for reasons regarding content.

TabGen I is the standard usage of the system because it presumes no deeper knowledge about the provided data.

2.1 Launching TabGen I

On the start page click on **Single data stock table generation** to open the window **Table generation I (single data stock)**. If you did not log in before, you now have to authenticate yourself.

2.2 Three steps of table generation

Table creation based on *TabGen I* requires three main steps: keyword selection to find data stocks that fit your needs, data stock selection from the resulting repertory, and definition of the table concerning layout and content (Figure 2.1 on page 11).

On the window **Table generation I** (Figure 2.2 on page 11) you can see five tabs (**Keywords**, **ICE-Data Stock**, **Stock Selection**, **Table Definition**, **ICE-Key**). During any table generation process you will be guided automatically along the first four tabs from left to right.

Below the tabs are two big boxes. At first the left box contains a list of all available keywords that you can choose from in alphabetical order. Selected keywords appear in the right box.

2 TabGen I – single data stock table generation

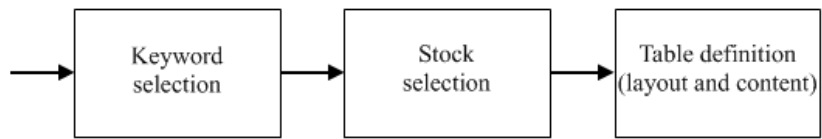


Figure 2.1: The main steps of table creation using TabGen I

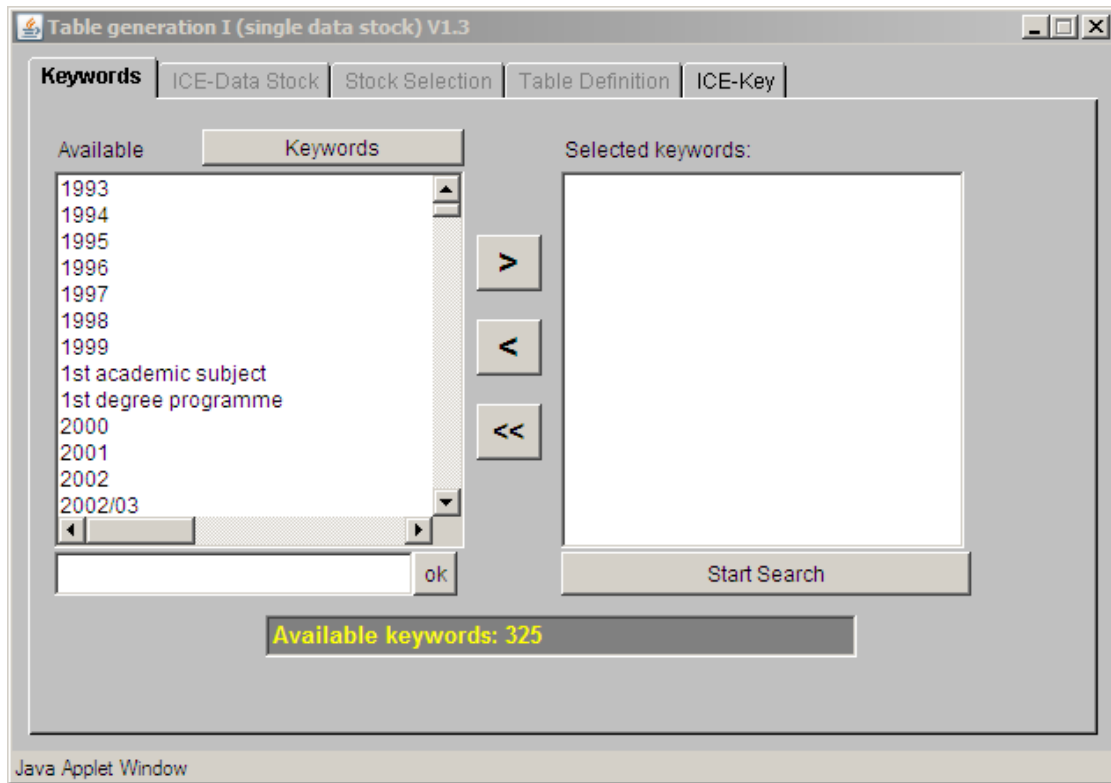


Figure 2.2: TabGen I - List of available keywords

2.2.1 Keyword selection

The *keywords* reflect the complete characteristics- and categories-stock of the ICE-key system. Some keywords represent *characteristics* (e.g. *gender*), others indicate *attributes* (e.g. *male* is an attribute of characteristic *gender*). Both types of keywords include different conceptual ranges. For instance the keyword *gender* covers several attributes (*male*, *female*, and *total*), while the keyword *male* directly sticks to one single attribute.

For another example, the keyword *Subject groups* refers to the characteristic of the same name. The related attributes range from *Art* to *Veterinary medicine*. For such terms that embrace a variety of attributes, ICE uses so called “or-connections” for related attribute names (i.e. the output of a stock search contains all stocks that include at least one fitting attribute), whereas in general “and-connections” are applied among keywords (i.e. search results show only those stocks that fit to all given keywords). For example, if you are looking for data about *Enroled students*, *Leave of absence*, and *New entrants*, you can search by the keyword *Study demand* that embraces all of these terms (among others), or you can select each term separately as keyword. All existing keywords are related to at least one ICE-key in a similar way.

At starting the table generation, ICE calls up all available keywords from the database. The keywords get alphabetically listed in the left box. By selecting some of these keywords, you can narrow down the number of stocks that you later will use for data search. ICE provides you with data stocks that suit all chosen keywords (“and-connection”).

How can you select keywords? In tab **Data Stocks** highlight a keyword in the left box with the left mouse button. Then click on the **rightwards arrow** to push it to the right box named **Selected keywords**. With the **leftwards key** you can remove highlighted keys from the right box; or use the **double arrow** to remove all selected keywords.

There are two ways to find fitting keywords: either use the scroll bar to go manually through the list, or enter the word you are searching for into the text box below and click on **ok**.

When you have selected enough keywords for a well directed data search, click on **Start Search** (Figure 2.3 on page 13).



The more precisely you narrow down the data search by selecting multiple *keywords*, the less is the number of “relevant” *data stocks* that you have to go through, and the less is the amount of data transfer between your system and the server.



If you know the id number of the stock you are searching for beforehand, you can click on **Keywords** to list up *stock numbers* instead of keywords. Then you can select stocks directly.

2 TabGen I – single data stock table generation

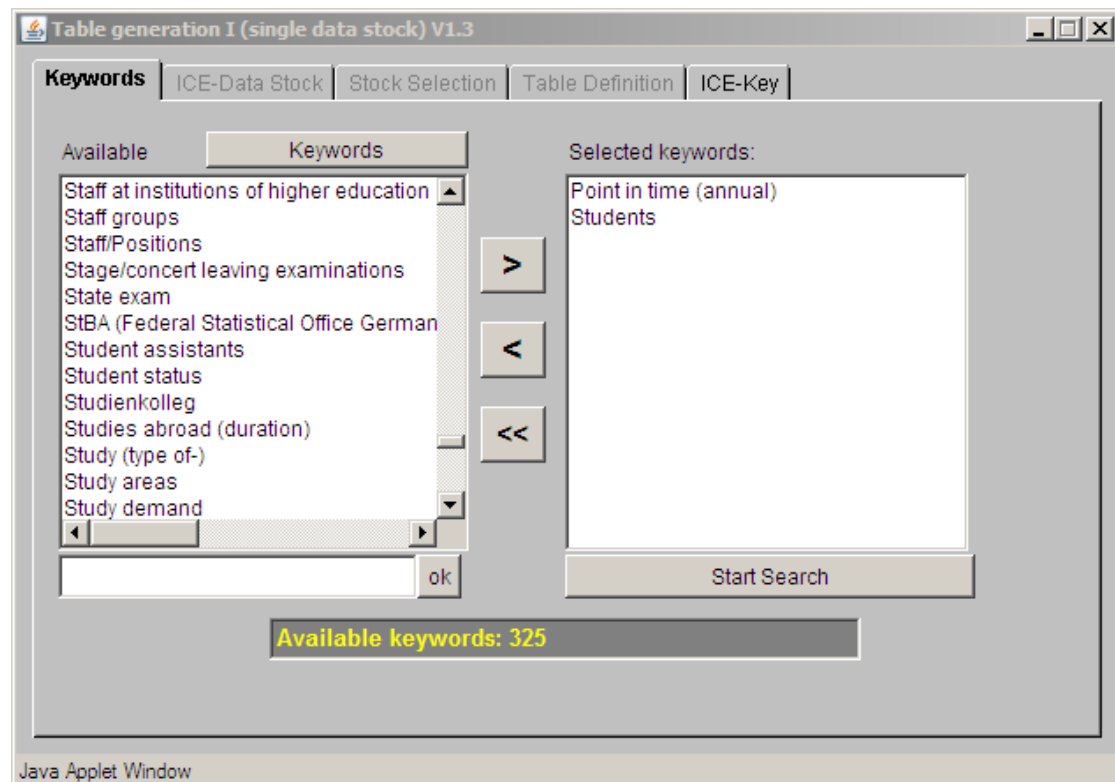


Figure 2.3: Two keywords have been selected

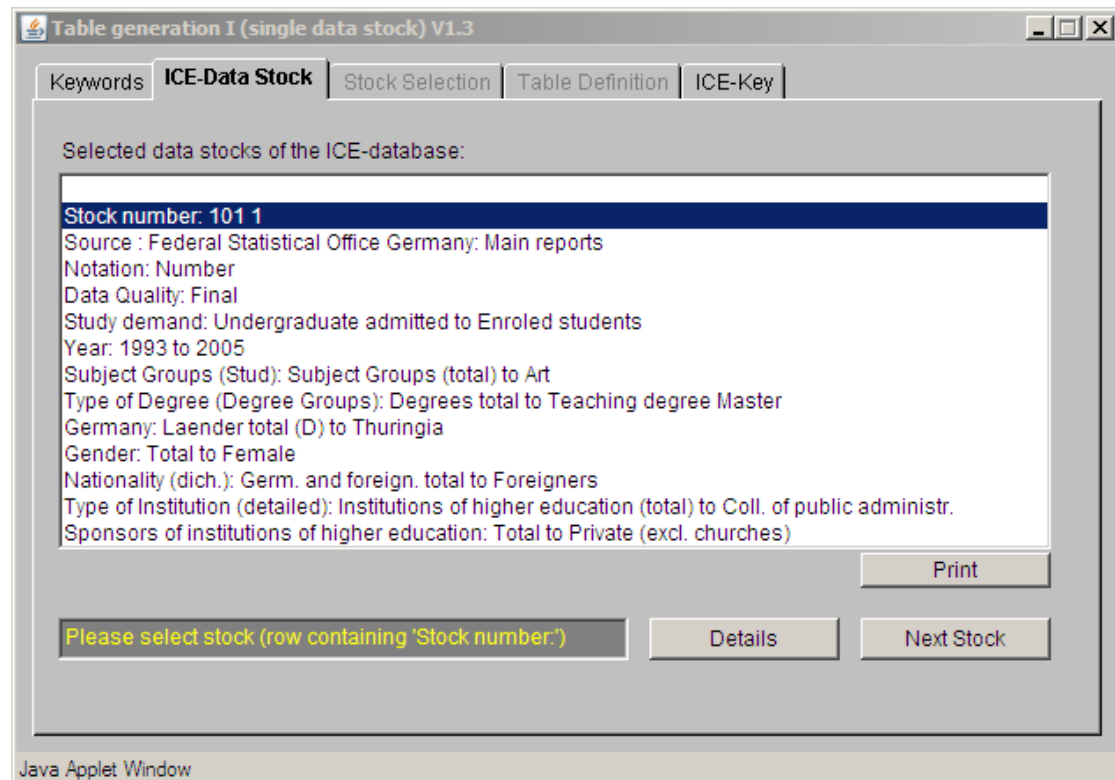


Figure 2.4: Properties of a data stock

2.2.2 Data stock selection

After passing the selected *keywords* to the ICE system, it provides you with the corresponding *data stocks* (Figure 2.4 on page 14). The tab **ICE-Data Stock** shows the first fitting stock, with information about *stock number*, *data source*, *notation*, *data quality*, and corresponding ICE-keys as combinations of *characteristics* and *attributes*. For every *characteristic* you can see the highest and the lowest *attribute* (high and low based on the ICE-key system). For example, the row

Study demand: Undergraduate admitted to Enroled students

means that within this data stock are data for the characteristic *Study demand* concerning a range of attributes from *Undergraduate* admitted to *Enroled students*.



To learn which attributes lay in between, you can go to tab **ICE-key** anytime.

At first you can access only one *data stock*. When this stock does not seem to fit your needs, and you want to look for alternatives, click on **Next Stock** to add further stocks

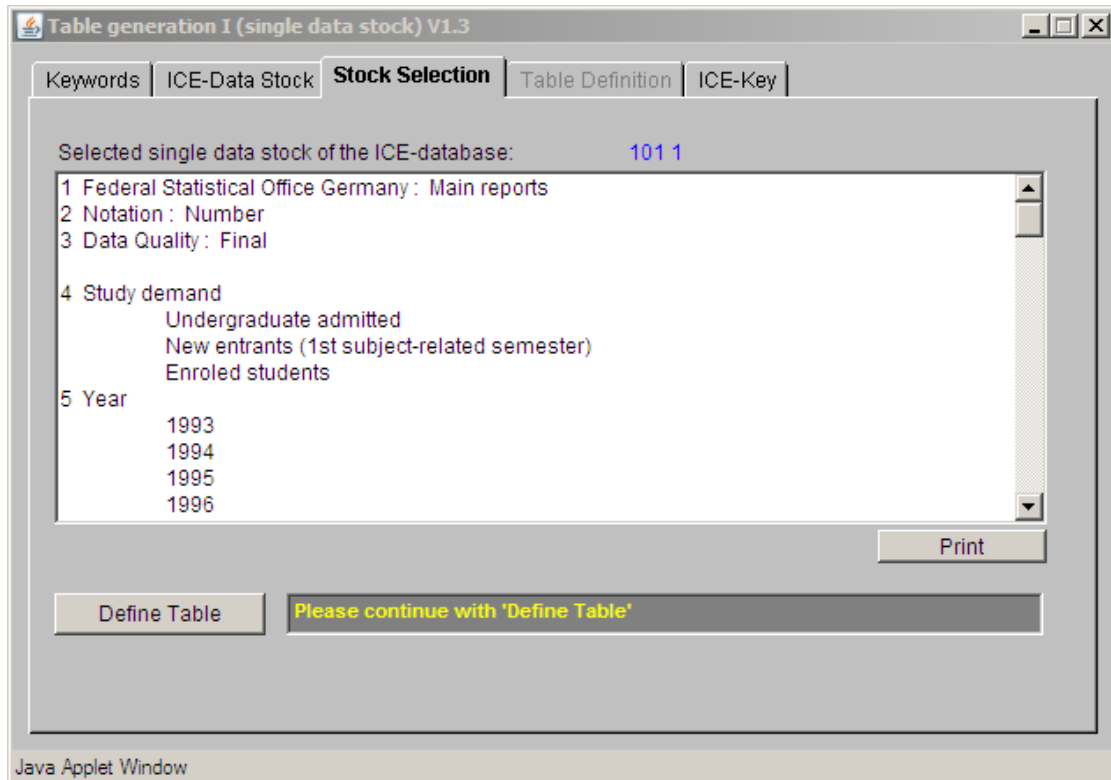


Figure 2.5: Detailed data stock description

to the tab, one by one. Use the scroll bar to go through the stocks. If you want deeper information on a stock, highlight the row with the **Stock number** by left mouse click, and then click on **Details** (Figure 2.4 on page 14).

The next tab, **Stock Selection**, provides you with more detailed information on the chosen data stock, including all attributes of the involved characteristic-keys (Figure 2.5 on page 15).

If you are not satisfied with the *stock*, you can go back to **ICE-Data Stock**, where you can select another one for more detailed insight. When you finally settle on a certain stock, click on **Define Table**.



To ease comparisons among *data stocks*, you can **Print** out summarised lists as well as detailed lists (Figure 2.5 on page 15).

2.2.3 Table structuring

A table is defined by rows- and columns-*characteristics* and corresponding *attributes*. You have to decide on which *characteristics* along with which *attributes* you want to

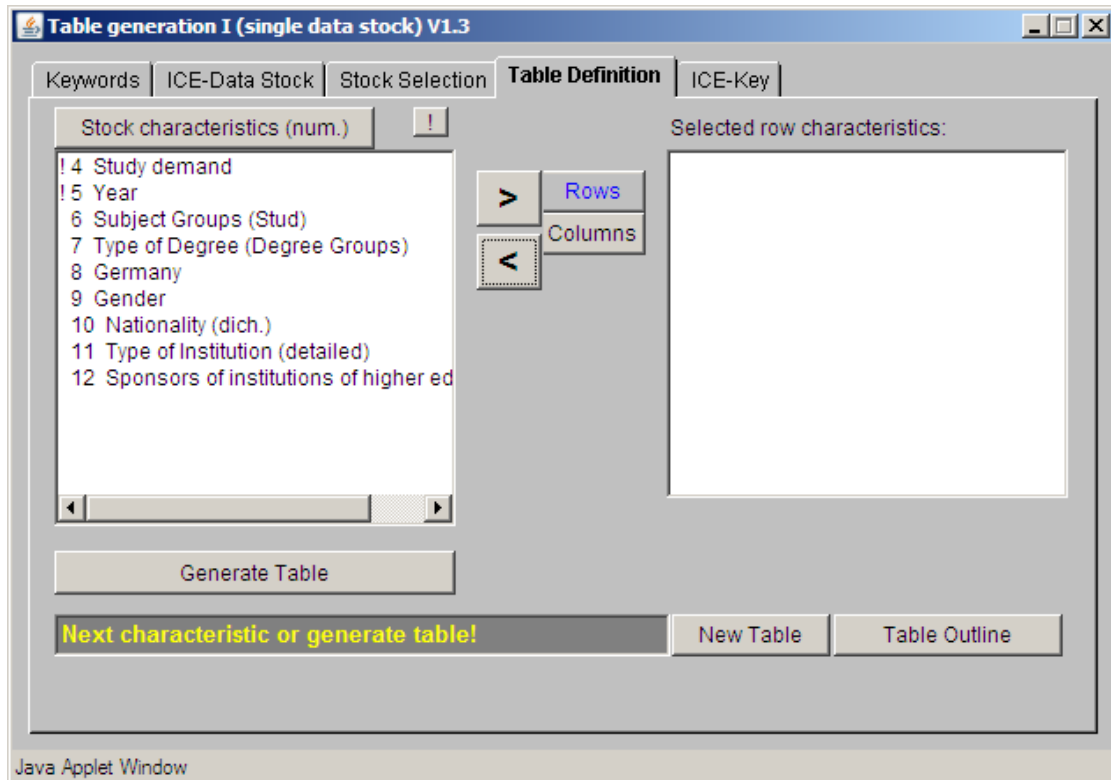


Figure 2.6: Before the generation of a table

include in *rows* and *columns* (Figure 2.6 on page 16).

Let's assume that you want to compile data on *new entrants (1st subject-related semester)* and *enroled students* by following structure:

- by type of institution (universities compared to all institutions of higher education),
- by subject groups, and
- by point in time (2003/2004).

Let's define this table with *type of institution*, *study demand*, and *point in time* in columns and *subject groups* in rows.

Tab **Table Definition** again shows two boxes and can be navigated very similar to tab **Data Stocks** (see Section 4.3). In between these boxes you can choose between **Rows**- and **Columns** definition. When you select a characteristic, its available attributes get listed in the right box, while the left box is getting cleared (Figure 2.7 on page 17). Now select the needed attributes, and pull them to the left box. When finished, click on **Next Characteristic** and proceed the same way for further rows and columns.

To stick to our example, at first, select characteristic *study demand* for **Columns** definition, and choose the attributes *enroled students* and *new entrants (1st subject-related semester)* (Figure 2.8 on page 19).

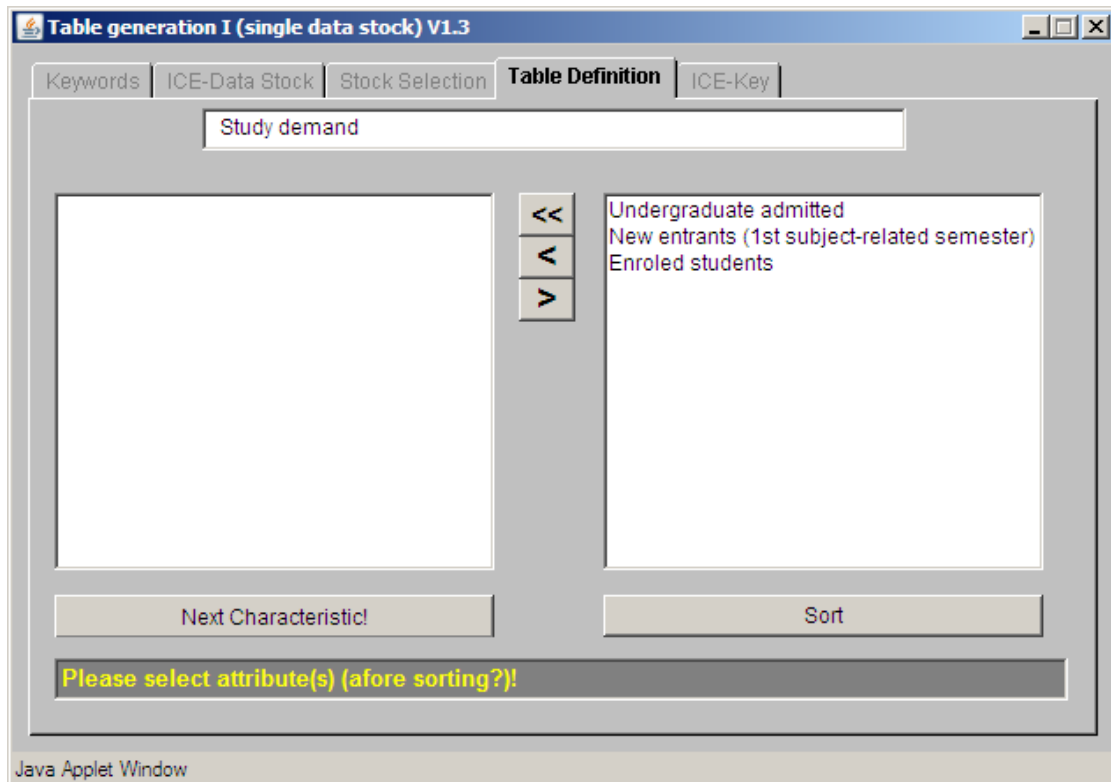


Figure 2.7: Characteristic “Study demand” has been selected for columns definition



If you want to include all, or nearly all *attributes* of a *characteristic* for your table, select them all with the **double arrow**, and then remove the maybe surplus. And if you only want to take a part of the attributes, you can highlight the first and the last of the wanted, and then highlight all in between at once by hitting “s” on your keyboard (Chapter 7).



The order of *attributes* in the left field reflects their final order in the table. By selecting and deselecting them, you can alter the order according to your wishes (Figure 2.8 on page 19).



In addition to the attribute *total* many characteristics have an attribute called *altogether*. Using *total* results in the sum of all available attributes, while using *altogether* sums up only those attributes that have been actually selected.

Push **Next Characteristic** to proceed with table structuring. Now *study demand* is not available for selection anymore but appears in the right box under **Selected column characteristics**. For the next columns level we want *universities* and all *institutions of higher education*, so select characteristic *type of institution* and then the corresponding attributes (*Institutions of higher education (total)*, and *Uni. (incl. CoE, CU, CT, CA)*).



Use the sort function to get a better overview on the *attributes* (Figure 2.7 on page 17). Click on **Sort** to get the attributes filed alphabetically . For a closer look at the sort functions see.

For the last column select attributes *2003*, and *2004* of characteristic *point in time*.

After finishing the columns definition, click on **Rows** and select all attributes of the characteristic *subject groups* (except the attribute *altogether*).

The table definition now is completed. But before you download the data from the server to finally generate the table, you may want to ascertain whether all specifications fit your needs.

2.2.4 Revision of the table structure

Anytime during table definition you can take a look at the table structure so far. You have two options for revision: a) **Table Outline**; b) **Preview**: (see Figure 2.9 on page 19)

2 TabGen I – single data stock table generation

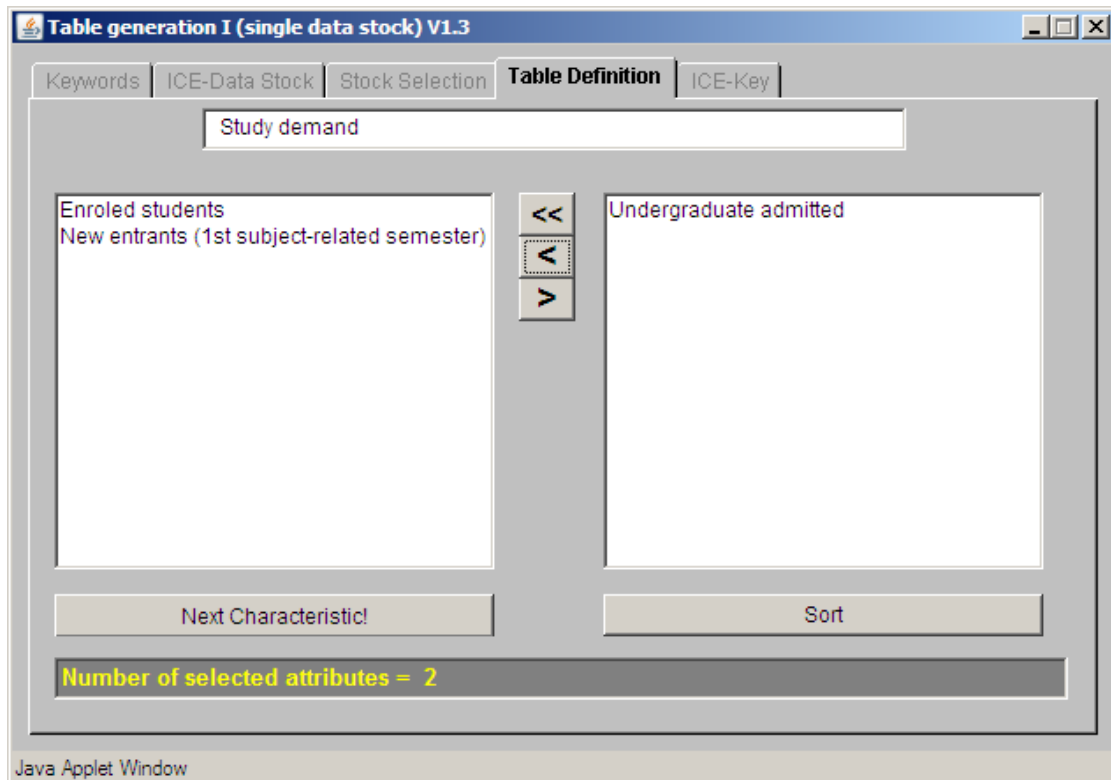


Figure 2.8: Two attributes of characteristic “Study demand” have been selected

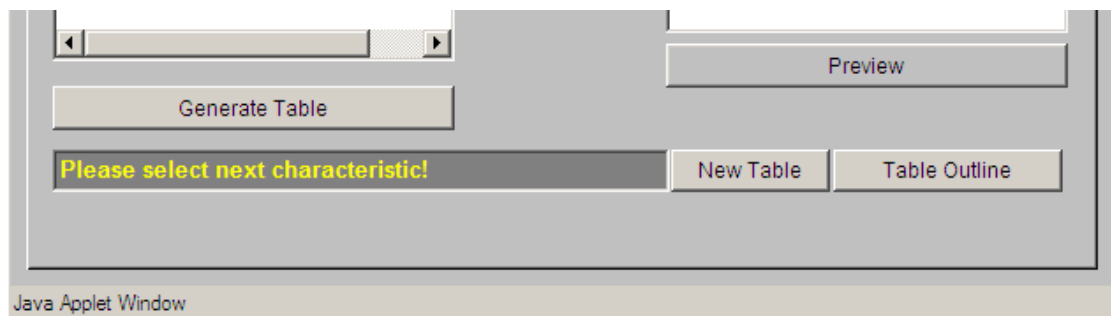


Figure 2.9: Window detail with buttons “Table Outline” and “Preview”

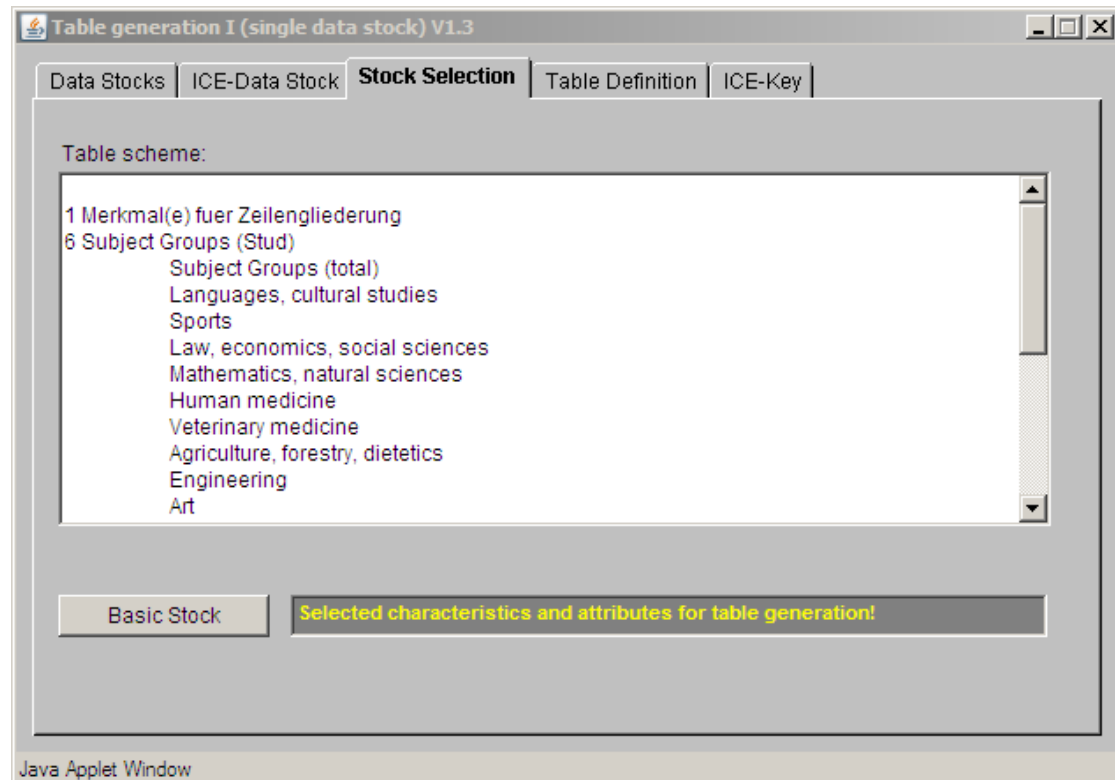


Figure 2.10: Table outline showing all selected characteristics and attributes

	Year							
	2003				2004			
	Enroled students		New entrants (1st subject-related semester)		Enroled students		New entrants (1st subject-related semester)	
	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)
Subject Groups (Stud)	Number							
Subject Groups (total)								
Languages, cultural studies								
Sports								
Law, economics, social sciences								
Mathematics, natural sciences								
Human medicine								
Veterinary medicine								
Agriculture, forestry, dietetics								
Engineering								
Art								

Figure 2.11: Preview of the table structure so far

Table Outline: (see Figure 2.10 on page 20) This button opens a list showing all selected characteristics and attributes. With the button below (**Basic Stock**) you can switch back and forth between this view and a description of all available characteristics and attributes of this stock. Go to tab **Table Definition** to proceed.

Preview: (Figure 2.11 on page 21) With this button you can generate a table with your specifications so far, except for the data missing. So you can gain a very concrete idea of what your table will look like in the end. Edit functions are not available in the preview mode. Close the window to return to table generation.



Anytime during table generation you can remove *characteristics* and *attributes*. If you want to remove or substitute a single attribute, first remove the corresponding characteristic (which also removes all attached attributes). Then you can select the characteristic anew with a new set of attributes.

2.2.5 Edit table structure by moving characteristics

Depending on the combination of characteristics and the number of attributes, the chosen order of characteristics can strongly influence shape and readability of tables.

	Year											
	2003				2004				2005			
	Enroled students		New entrants (1st subject-related semester)		Enroled students		New entrants (1st subject-related semester)		Enroled students		New entrants (1st subject-related semester)	
	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)
Gender	Number											
Total												
Male												
Female												

Java Applet Window

Figure 2.12: Preview example 1 - comparison by institution types

The following example (see Figure 2.12 on page 22 and Figure 2.13 on page 23) shows the same data in different structured tables. While the first table provides a concise comparison of *institution type* and *gender*, the second table shows a well readable time series comparison of *enroled students* and *new entrants* at various *institution types*.

Subsequent modifications to the table structure are possible without renewed selection of *characteristics* and attributes: In the right box, highlight the *characteristic* that you want to move, and then click on **Move**. Now you can use the mouse to drag the *characteristic* to a new position (Figure 2.14 on page 23).



As soon as you click on a *characteristic* in the right box (given there are multiple characteristics), the **Preview** button vanishes and gets substituted by the **Move** button. When you move a *characteristic*, the button will change back automatically. But if you click on the left box without having moved a *characteristic*, the **Move** button will remain until another *characteristic* will have been shoved to the right side.

2.2.6 Obligatory characteristics at table generation

At table definition there are characteristics that must be included in the table structure. It does not matter whether they are assigned to rows or to columns.

This “restriction” is required because of reasons regarding content: For example, nearly all ICE-data are related to time, and it would not make any sense to define numbers

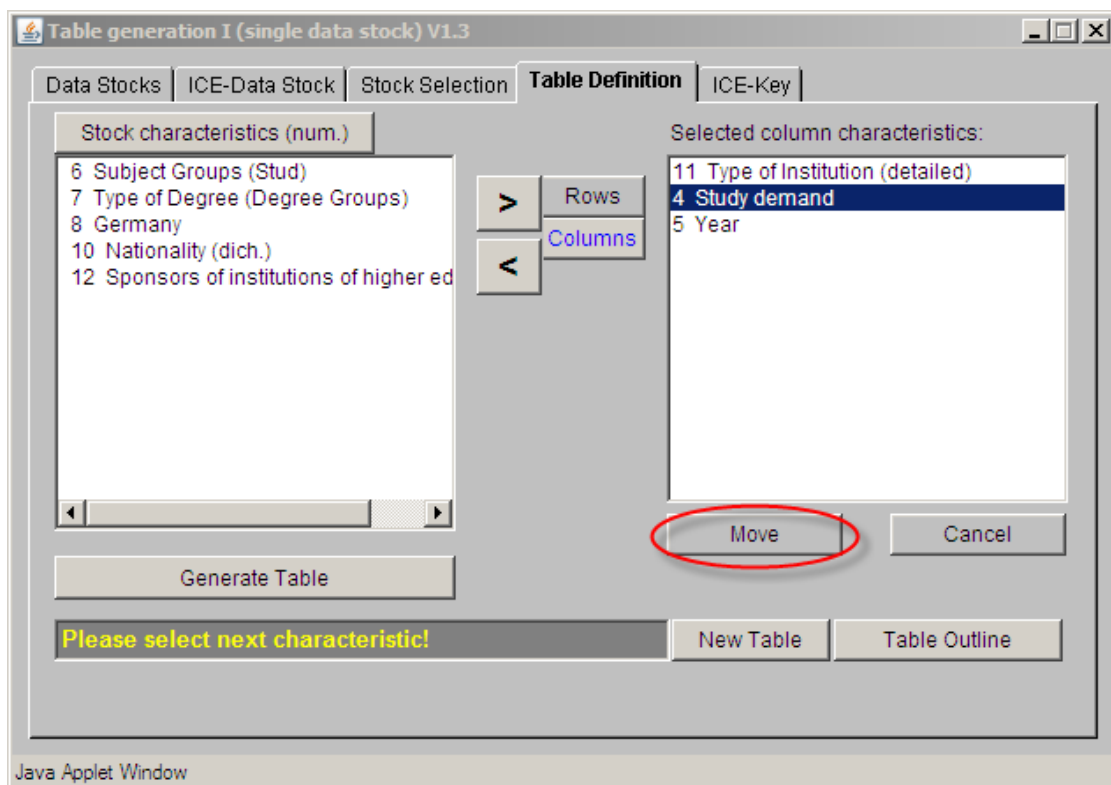
2 TabGen I – single data stock table generation

Table preview

	Study demand											
	Enroled students						New entrants (1st subject-related semester)					
	Institutions of higher education (total)			Uni. (incl. CoE, CU, CT, CA)			Institutions of higher education (total)			Uni. (incl. CoE, CU, CT, CA)		
	2003	2004	2005	2003	2004	2005	2003	2004	2005	2003	2004	2005
Gender	Number											
Total												
Male												
Female												

Java Applet Window

Figure 2.13: Preview example 2 - time series comparison



The 'Table generation I (single data stock) V1.3' window is divided into several sections:

- Data Stocks**: A list of characteristics including '6 Subject Groups (Stud)', '7 Type of Degree (Degree Groups)', '8 Germany', '10 Nationality (dich.)', and '12 Sponsors of institutions of higher ed'.
- Table Definition**: A section with 'Rows' and 'Columns' buttons.
- Selected column characteristics**: A list of selected characteristics including '11 Type of Institution (detailed)', '4 Study demand', and '5 Year'.
- Move**: A button that is highlighted with a red circle, indicating it is the active function when a characteristic is selected in the right box.
- Generate Table**: A button to generate the table.
- Please select next characteristic!**: A message box at the bottom.
- New Table** and **Table Outline**: Buttons at the bottom right.

The window is titled 'Table generation I (single data stock) V1.3' and is a Java Applet Window.

Figure 2.14: Selecting a characteristic in the right box activates the **Move** function

of *enroled students* or of *staff positions* without stating concrete time references. So normally at table generation you have to select a time related characteristic.

Furthermore there are those characteristics that do not have the *total* (2.2.3) attribute. For some characteristics a total of its attributes would be senseless (to sum up *enroled students* and *new entrants* would not result in any useful information because these attributes have intersections). When searching for proper data to satisfy incompletely defined data requests, the system automatically sets attributes of those characteristics to *total* that appear in stock description but not in table structure. For instance, the stock of the example above contains the subcategorization *gender*. Since this characteristic has not been included in the table structure, the system considers this subcategorization as not wanted, and so it adopts the attribute *total* for the characteristic. Characteristics that have multiple attributes but not the attribute *total* are obligatory and must be included in the table structure.

How can you identify obligatory characteristics? These characteristics that must be used for table definition are marked in the left box with the prefix '!'.

Yet as long as you do not have included all obligatory characteristics, on the table generation window there is a little button showing '!' above the big box to the left. Clicking on it opens a new window showing a text that explains the meaning of '!' (see Figure 2.15 on page 25).

2.2.7 Cancel and restart table generation

Anytime you can abort the table generation process (except during data transfers and calculations) by clicking on **New Table** (see Figure 2.15 on page 25) to start a new table definition.

CAUTION! You cannot recover any settings you have defined so far. The former table generation will be lost without recall. You must restart the table definition right from the beginning.

2.2.8 Data transfer and definition of table titles

After you have completed the table definition for all rows and columns, you can finally hit the **Generate Table** button.

A window pops up indicating the number of single values that will be transferred from the database. This helps you to estimate the length of time of the following data transfer. Soon after a few table generations, you will get a feeling for the expected duration of this process by the number of the single values. If you consider this number too high, you can go back to table definition (press **Cancel**). Otherwise select **Next** (see Figure 2.16 on page 26).

Now ICE is fetching data from the database. The state of the process is getting displayed in the progress bar, and the text field shows the progress in numbers of transferred data (see Figure 2.17 on page 27).

After the data transfer is completed, a new tab opens, with a big box in the middle offering a table title. This automatically generated title derives from the descriptions of

2 TabGen I – single data stock table generation

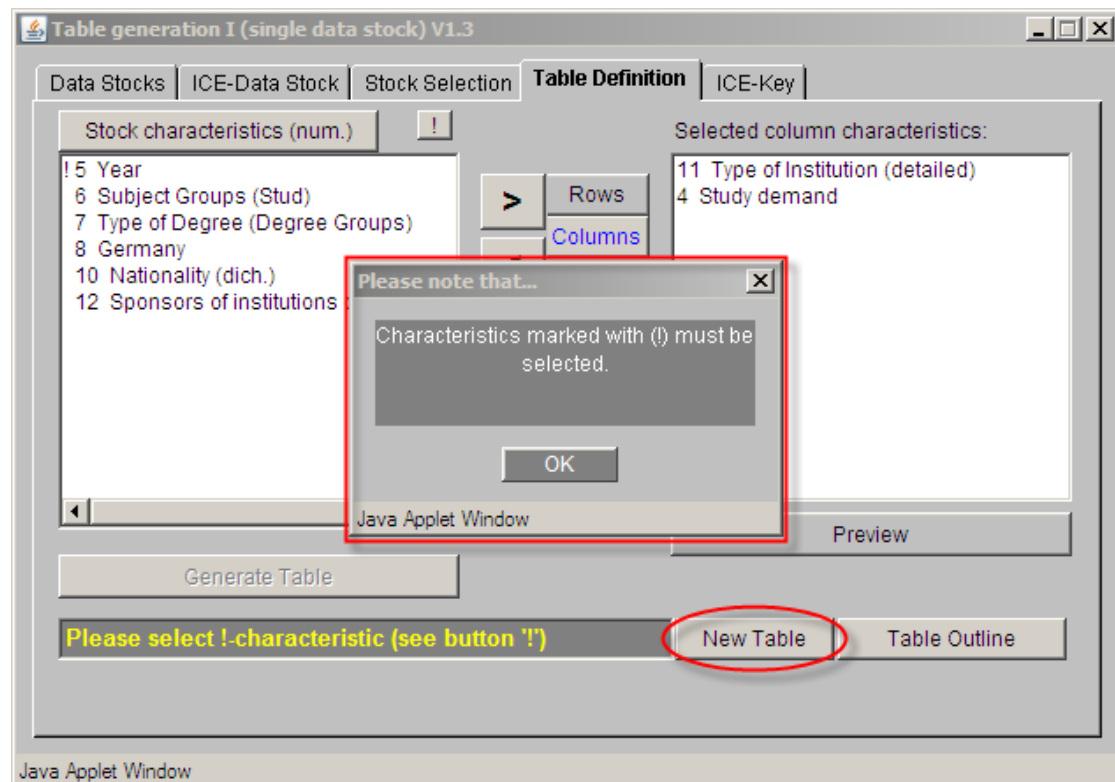


Figure 2.15: Little reminder window of obligatory characteristics

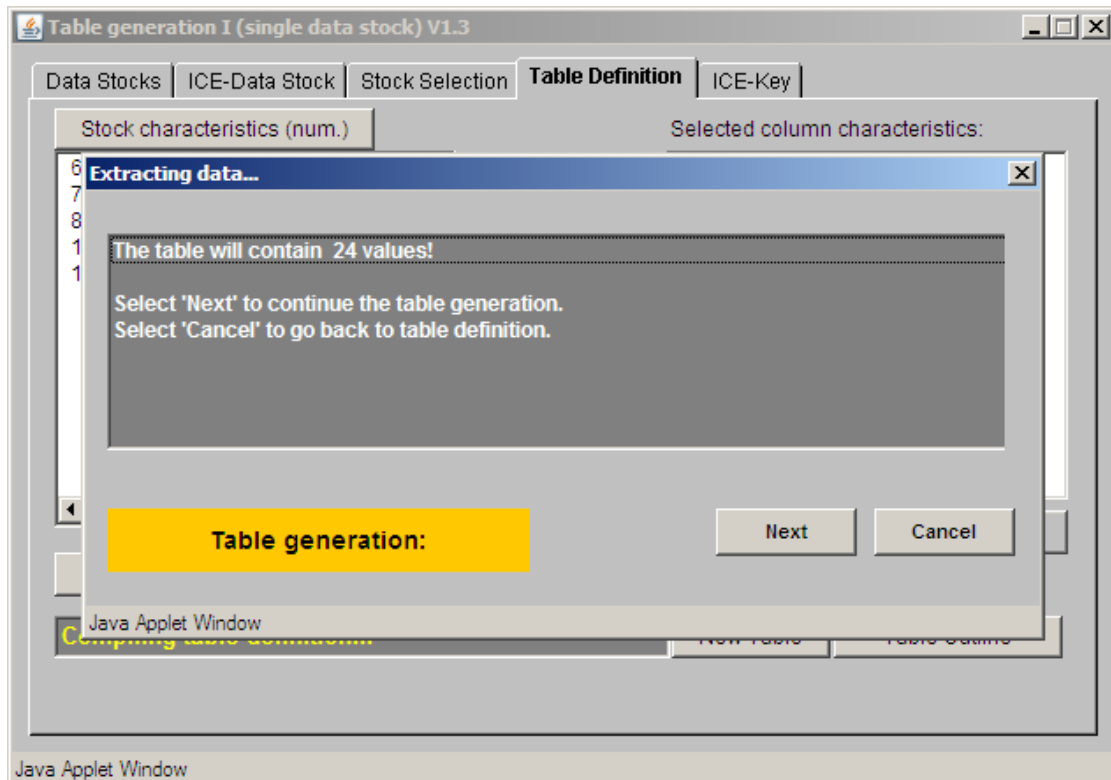


Figure 2.16: The number of single values that shall be transferred from the database

2 TabGen I – single data stock table generation

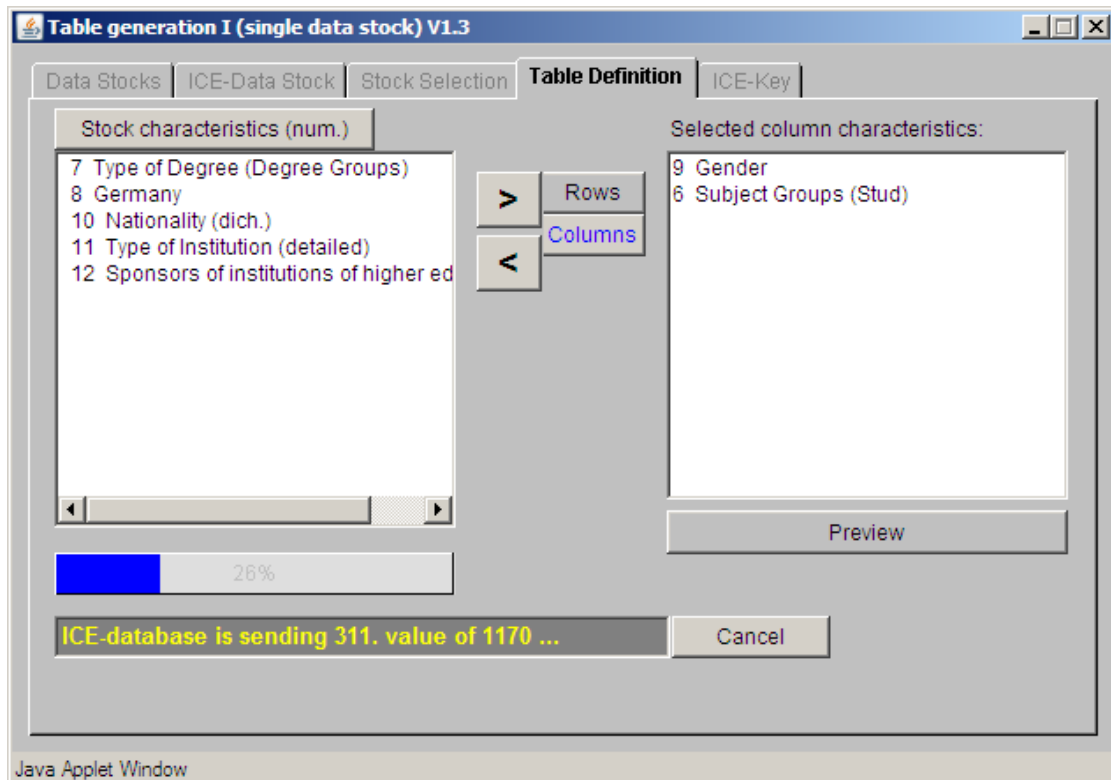


Figure 2.17: Data transfer from the database

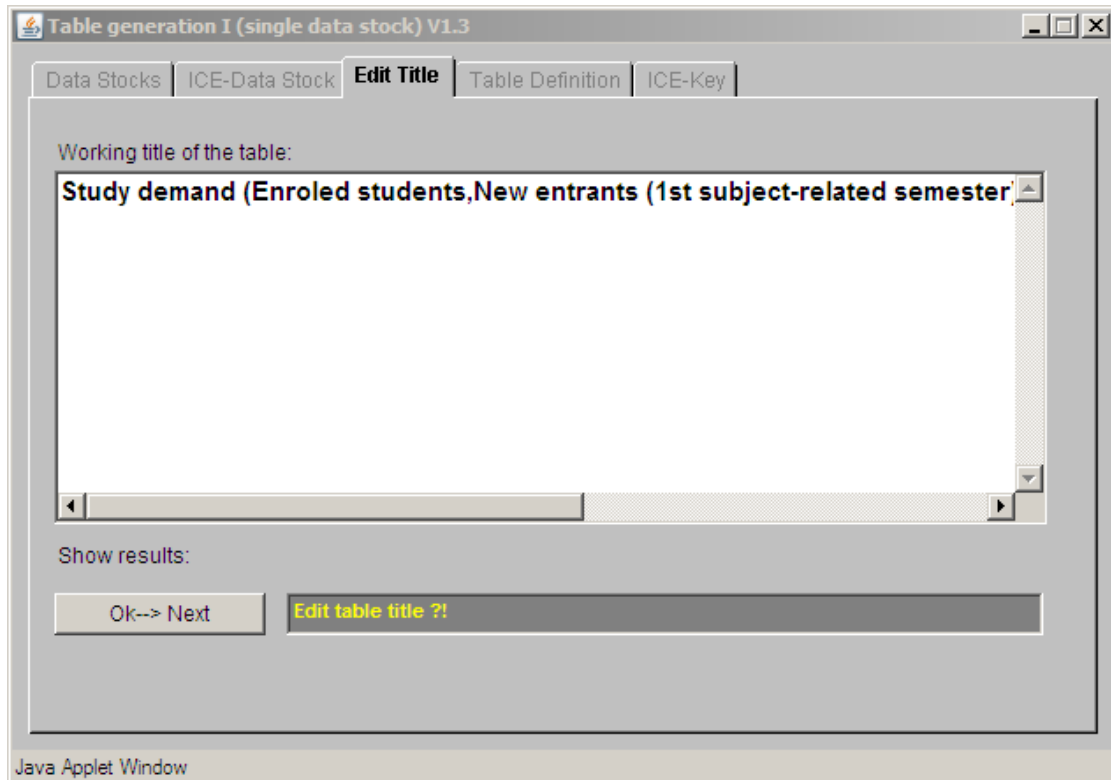


Figure 2.18: Automatically generated table title

the used keys that are stored in the ICE-database, and hence the title specifies the table contents quite well. Nevertheless you are totally free in selecting any name for your title. Just click on the given title in the box and enter a new one (Figure 2.18 on page 28 and Figure 2.19 on page 29).

Then hit **Ok--> Next**, and now you can examine the table in the *ICE-spreadsheet* (Figure 2.20 on page 30).

2.3 Table export to other formats (HTML, PDF, XLS)

In case you use Microsoft Excel, you can export ICE tables directly to Excel (XLS-format) for further processing. For that purpose, after finishing the table generation, go back to the table generation window. There click on the **Excel** button (see Figure 2.21 on page 31).

For Excel being automatically opened, your browser must have the corresponding settings. Normally these are the default settings of your browser, and there is no need for further actions. So pressing **Excel** should open MS Excel with your just created table. The table now is free for any modifications.

Figure 2.22 on page 32 shows an Excel table that has been created with *table genera-*

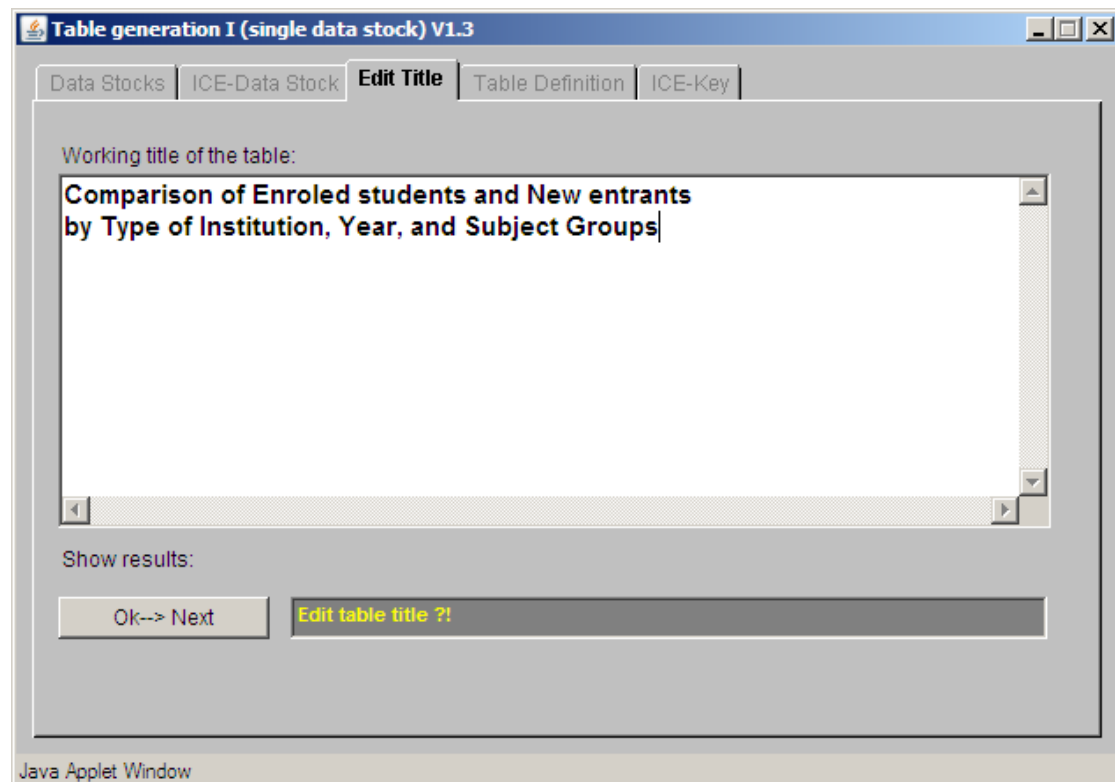


Figure 2.19: User defined table title

2 TabGen I – single data stock table generation

The screenshot shows the ICE-Spread Sheet application window. The title bar reads "ICE-Spread Sheet". The menu bar includes "File", "Edit", "View", "Format", "Table", "Calculations", and "Help". The toolbar contains various icons for file operations and a "Functions" dropdown. The "Table Title" section contains the following text:

Table : 1
Study demand (Enroled students, New entrants (1st subject-related semester)) by Subject
Groups (Stud), Type of Institution (detailed), Year

The main data table is displayed with columns A through D. The data is organized as follows:

Year	Enroled students		New entrants (1st subject-related semester)	
2003	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)
Subject Groups (Stud)	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Subject Groups (total)	2.019.465	1.467.890	530.328	
Languages, cultural studies	447.574	435.082	122.483	
Sports	28.672	28.672	6.128	
Law, economics, social sciences	641.435	386.513	168.521	
Mathematics, natural sciences	357.953	292.580	98.226	
Human medicine	94.225	94.225	15.557	
Veterinary medicine	7.688	7.688	1.740	
Agriculture, forestry, dietetics	39.249	22.121	11.280	
Engineering	317.963	134.279	87.542	
Art	84.268	66.335	18.343	

The "Sources and Notes" section at the bottom contains the text: "Source: Federal Statistical Office Germany, Main reports".

Figure 2.20: Results table opened in ICEcalc

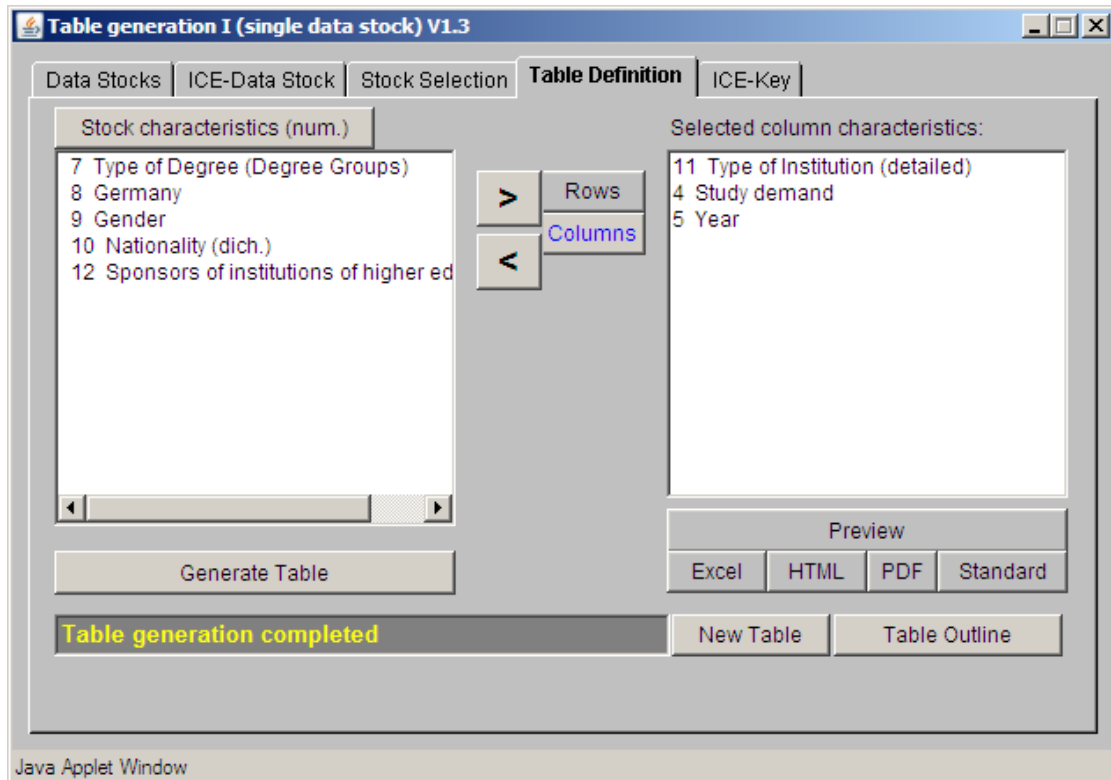


Figure 2.21: When the table generation is completed, four buttons for various export formats appear in the table generation window: **Excel**, **HTML**, **PDF**, and **Standard**

2 TabGen I – single data stock table generation

Microsoft Excel - tabletemp.xls

Standard Report

		Year					
		2003				2004	
		Enroled students		New entrants (1st subject-related)		Enroled students	
		Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)	Institutions of higher education (total)	Uni. (incl. CoE, CU, CT, CA)
12	Subject Groups (Stud)	Number					
13	Subject Groups (total)	2019465	1467890	530328	380689	1963108	1403491
14	Languages, cultural studies	447574	435082	122483	118958	416745	404187
15	Sports	28672	28672	6128	6128	28112	28112
16	Law, economics, social sciences	641435	386513	168521	99735	611370	362779
17	Mathematics, natural sciences	357953	292580	98226	80482	350584	283804
18	Human medicine	94225	94225	15557	15557	108510	98466
19	Veterinary medicine	7688	7688	1740	1740	7769	7769
20	Agriculture, forestry, design	39249	22121	11280	6875	39597	22046
21	Engineering	317963	134279	87542	35962	318781	132697
22	Art	84268	66335	18343	14796	81263	63265
25	Source: Federal Statistical Office Germany; Main reports						
27	Stock: 101						
29	Results of the HIS-ICE-Database (ICE = Information, Controlling, Entscheidung)						
30	Hochschul-Informations-System GmbH, Hannover						
31	http://www.his.de						
33	Last modified: April 25, 2008						

Standard Report

Figure 2.22: Table export to Microsoft Excel

tion I. It depends on your browser settings – either Excel is used as plug-in or as external viewer – whether the table gets opened within your browser or outside of it.

In a similar way you can export your tables to HTML and PDF formats. To learn more about *standard tables* see Chapter 5.

3 TabGen II – multi data stock table generation

The second level of ICE table generation is called *multi data stock table generation* (or just *TabGen II*). *TabGen II* enables you to combine different data stocks within a single table. Handling with *TabGen II* seems much like linking up several *TabGen I* processes one after another. So you define several *table units*, each based upon an individual data stock that may differ from table unit to table unit. These *table units* are put together to build one table.

Multi data stock table generation provides a high degree of flexibility. But when you use this type of table generation, you have to act with caution: in contrast to type *I* that has a kind of “control system regarding content”, type *II* tolerates the combination of various data that may not match up (depending on the eye of the beholder). For example it is possible to mix final with provisional data within one table. In some cases this may be intended, but normally such data combinations are considered inconsistent.

So *multi data stock table generation* assumes some deeper knowledge of the existing data stocks.

3.1 Launching TabGen II

You can start **Multi data stock table generation** on the ICE home page. At first *TabGen II* equals exactly type *I*. If you did not log in before, you now have to authenticate yourself.

3.2 Steps of TabGen II

At *TabGen II*, you define several *table units* one after the other. The particular definition of each *table unit* equals very much table definition at *TabGen I*. The table structure should be well planned beforehand, since you have to combine various *table units* that will partly share the same labels (titles) in the final table.

The table definition runs in repeating steps (see Figure 3.1 on page 34) that allow any user-defined extensions, for example you can raise the number of rows and columns by any amount and as often as you like.

3.2.1 Planning a table structure

Tables created with *TabGen II* are made up of separate segments (*table units*) that you combine one by one based upon an initial *table unit*. Figure 3.2 on page 34 illustrates

3 TabGen II – multi data stock table generation

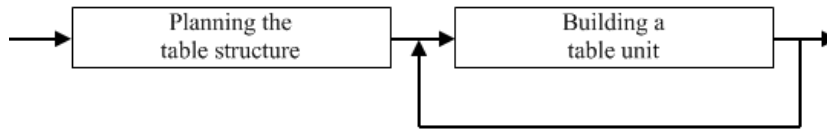


Figure 3.1: Course of action at multi data stock table generation

	Column label 1	Column label 2	Column label 3	...
Row label 1	table unit 1.1	table unit 1.2	table unit 1.3	...
Row label 2	table unit 2.1	table unit 2.2	table unit 2.3	...
⋮				

Figure 3.2: Table structure of a table consisting of several “table units”

the structure of how a table is divided into *table units*.

On Figure 3.2 on page 34 the table is made up of six *table units* with overlapping row and column labels (i.e. row label 1 applies to table units 1.1, 1.2, and 1.3). The labels (titles) get generated the same way as at TabGen I, so they may be quite complex. The generation of such a table starts with definition of table unit 1.1, and in doing so row label 1 and column label 1 get defined for the complete table. The next step could either be definition of table unit 1.2 (with predefined row label) or definition of table unit 2.1 (with predefined column label). In this way the remaining table units follow. Since the titles (labels) carry meaning regarding contents of the characteristics, you should have a precise idea of the table structure in advance. So for complex tables it may be advisable to put a drawing down on paper.

The definition of a *table unit* goes the same way as the table definition at *TabGen I* (see 2.2): keyword selection, data stock selection, table structuring. But at *TabGen II*, starting with the second *table unit*, ICE filters the *data stock selection* depending on the *characteristics* and *attributes* of the initial table unit (table unit 1.1) because the data stocks of all following table units must be able to match the predefined labels.

Let us generate an exemplary table with the following specifications: The initial *table unit* shall include data on “College Staff” as well as the “Year” in columns. In rows we want to compare some Sri Lankan institutions of higher education. So we select *characteristic* “University” and choose among the related *attributes*, taking “Colombo”,

“Peradeniya”, “Kelaniya”, “Moratuwa”, and “Total”. For the next *table unit* let us add the characteristic “Faculty/Academic Stream” in rows with all available *attributes*. Since we have chosen further row labels for this *table unit*, it automatically shares the column labels with the initial *table unit* 1.1. In terms of Figure 3.2 on page 34, we name it *table unit* 2.1.

In the next steps we want to extend this table by adding further columns. In the first column we already have college staff data. The next column block shall include student data, and the last column block expenditure data. Further row definitions are not necessary/possible, since the labels of *table units* 1.1 and 2.1 will be adopted automatically. All in all this makes a total of six *table units*, just like in Figure 3.2 on page 34.

Not later than at this point we have to think about the nature of the data that we intend to compare. To enable sensible comparisons, we need data of similar quality level. So we only use stocks that provide *final data* by the Sri Lankan University Grants Commission. In general we have furthermore to take care about the *point in time*. Some data, like data on students, may refer to semesters and others to years. For our example let us compare data of the year 2005.

3.2.2 Defining the initial table unit

As stated before, the procedure of defining *table units* is nearly the same as of table definitions at *TabGen I*. At keyword selection choose “*Staff groups*” and “*University*”. Then make sure that you select a data stock that provides the *characteristics* “*College staff*” and “*University*” along with the corresponding *attributes* “*Scientific and creative arts staff*” and the universities of “*Colombo*”, “*Peradeniya*”, “*Kelaniya*”, and “*Moratuwa*” as well as “*Total*”. The stock should provide final data by the Sri Lankan University Grants Commission and the “*Year*” “*2005*”.

At table structuring put “*College Staff*” and “*Year*” into columns with the attributes “*Scientific and creative arts staff*” and “*2005*”, and for rows select “*University*” with the attributes mentioned above (see Figure 3.3 on page 36).

3.2.3 Defining further table units

So far the only difference of the user interfaces of *table generation I & II* is the ‘+’ button at *type II* (see Figure 3.3 on page 36). After finishing the definition of the initial table unit, you can click on ‘+’ to start the definition of the next table unit.

You have to decide whether to extend the table in columns or in rows. For our example, please select **Rows** (see Figure 3.4 on page 37) and confirm your selection.

You return to *keyword selection*, and now you define *table unit* 2.1 just like a table at *TabGen I*, with the exception that the columns definition is not available because it is predefined by the initial *table unit*.



If you know the id-number of the data stock that you need, you can click on **Keywords** for direct stock selection.

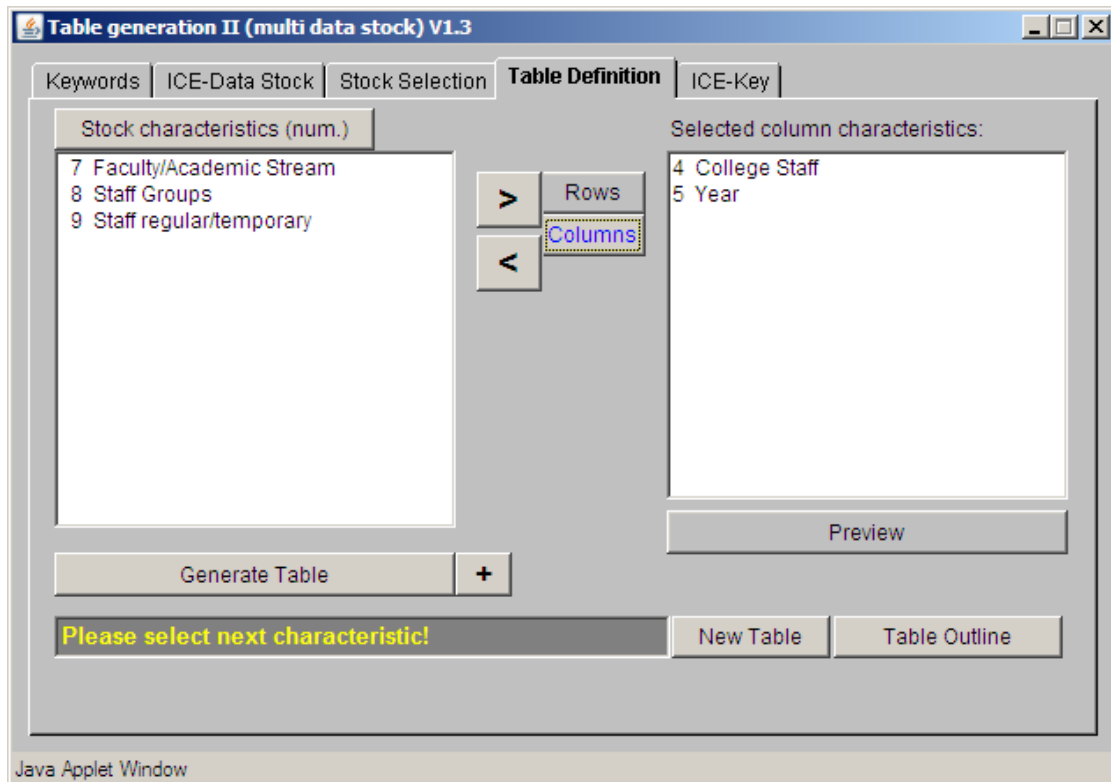


Figure 3.3: Columns definition at table generation II

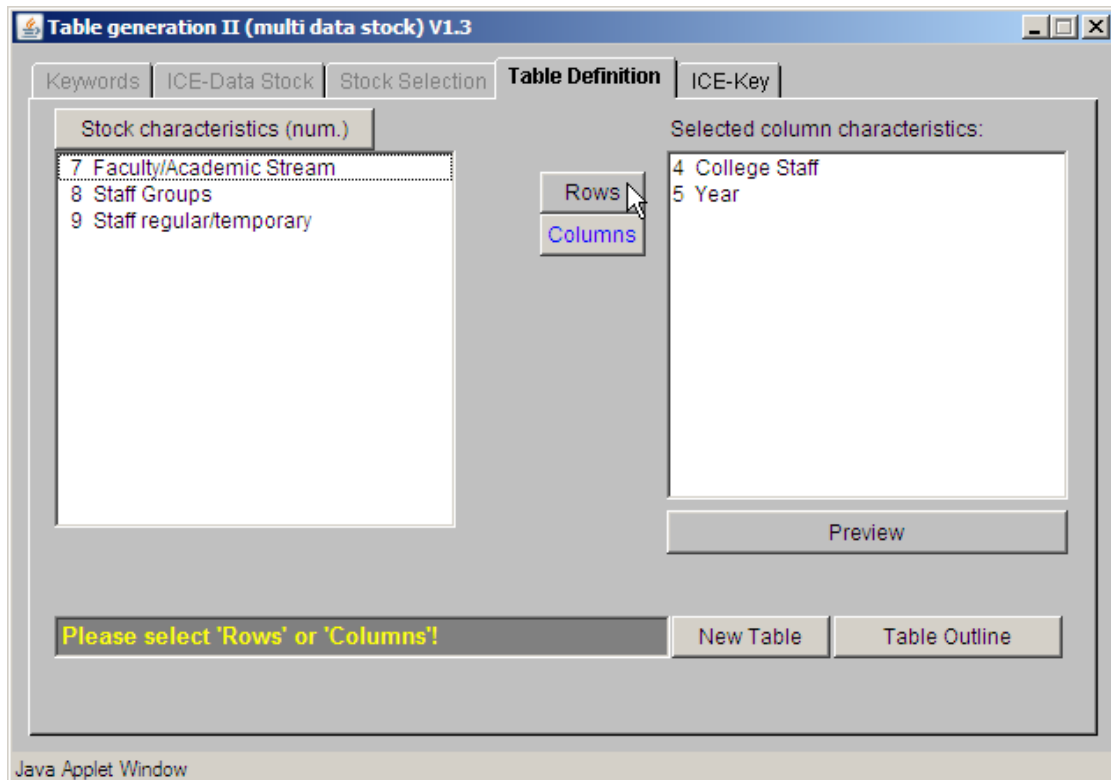


Figure 3.4: Choose whether to extend the table in columns or in rows

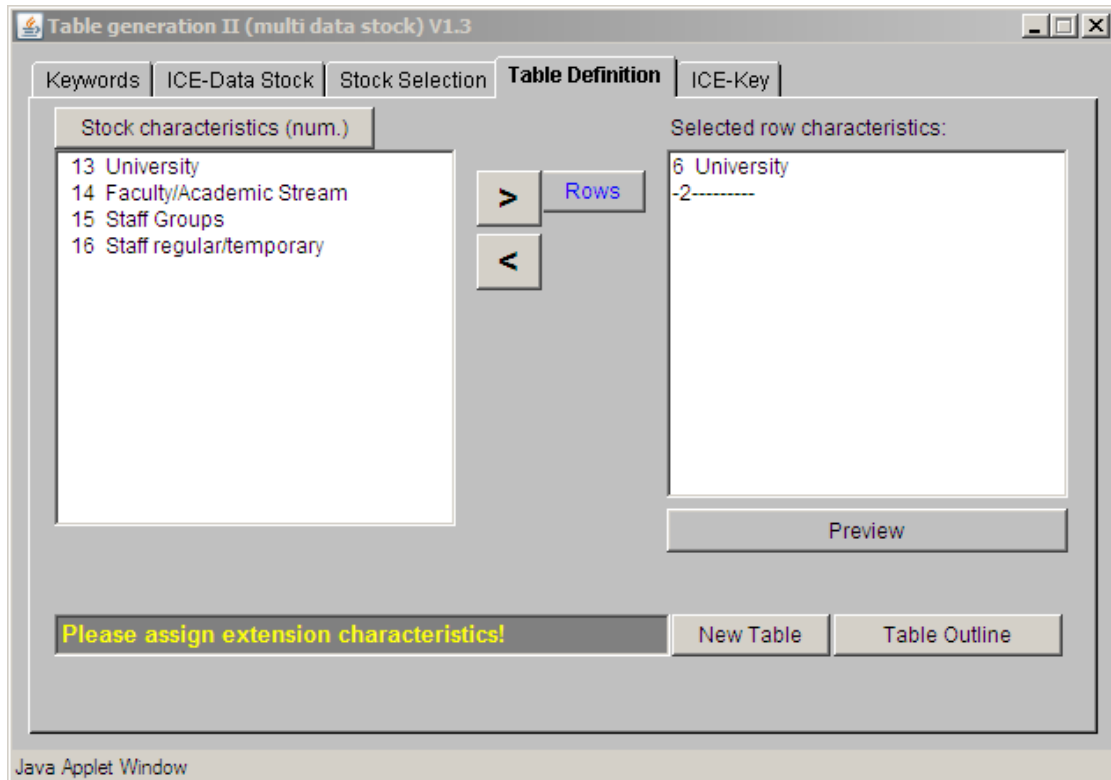


Figure 3.5: Extended table definition for rows

For the second *table unit* enter *keyword* “*Faculty/Academic Stream*”. At stock selection take care that all columns-*attributes* of the initial *table unit* are available, too, otherwise your table would contain empty cells. And you should also check up on the data quality.

At table definition you now can only add rows because of the predefined columns. The right box now displays the previous selected *characteristics* for the rows definition (see Figure 3.5 on page 38).

Now please select “*Faculty/Academic Stream*” with all related attributes (see Figure 3.6 on page 39).

The rows definition now is finished for the complete table. Four *table units* are still missing, and from now on the only extensions that are required concern columns. So click on ‘+’ and select **Columns**. Then you once again start with keyword selection. Fitting keywords would be “Study demand” for finding data on enroled students and “Point in time (annual)” since you need to find data of the year 2005. At **Stock Selection** make sure that these wanted *attributes* are included as well as all *attributes* of the predefined rows, and do not forget to check on the *data quality*. At columns definition select *characteristic* “*Study demand*” with *attribute* “*Enroled students*”, and select the “*Year*” “*2005*”. By defining a new columns block, you define two *table units* at once (1.2 and 2.2) (see Figure 3.7 on page 40).

3 TabGen II – multi data stock table generation

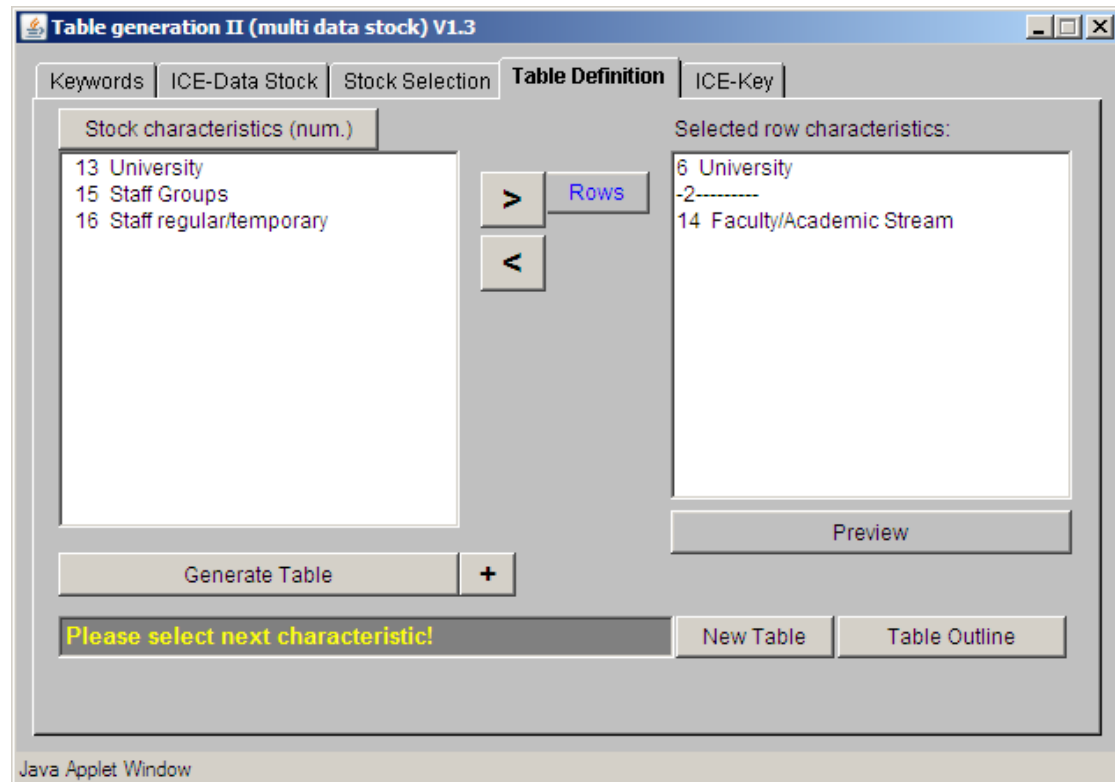


Figure 3.6: The table structure has been extended in rows

3 TabGen II – multi data stock table generation

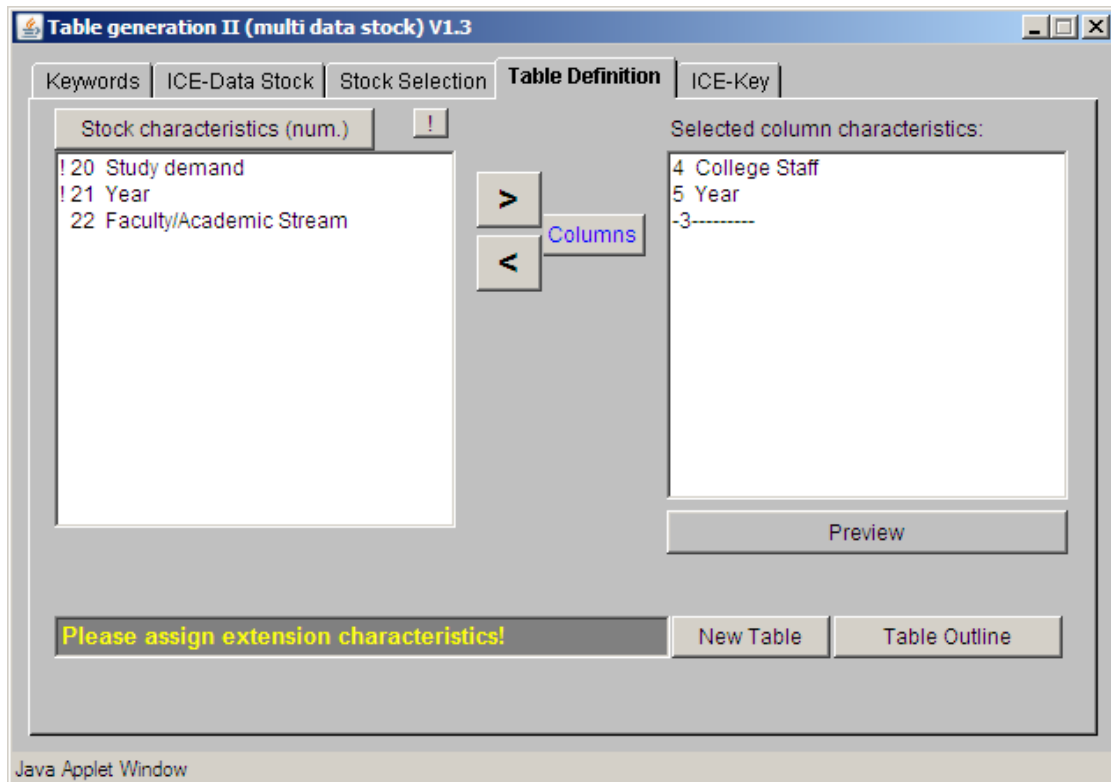


Figure 3.7: Columns extension at “multi data stock table generation”

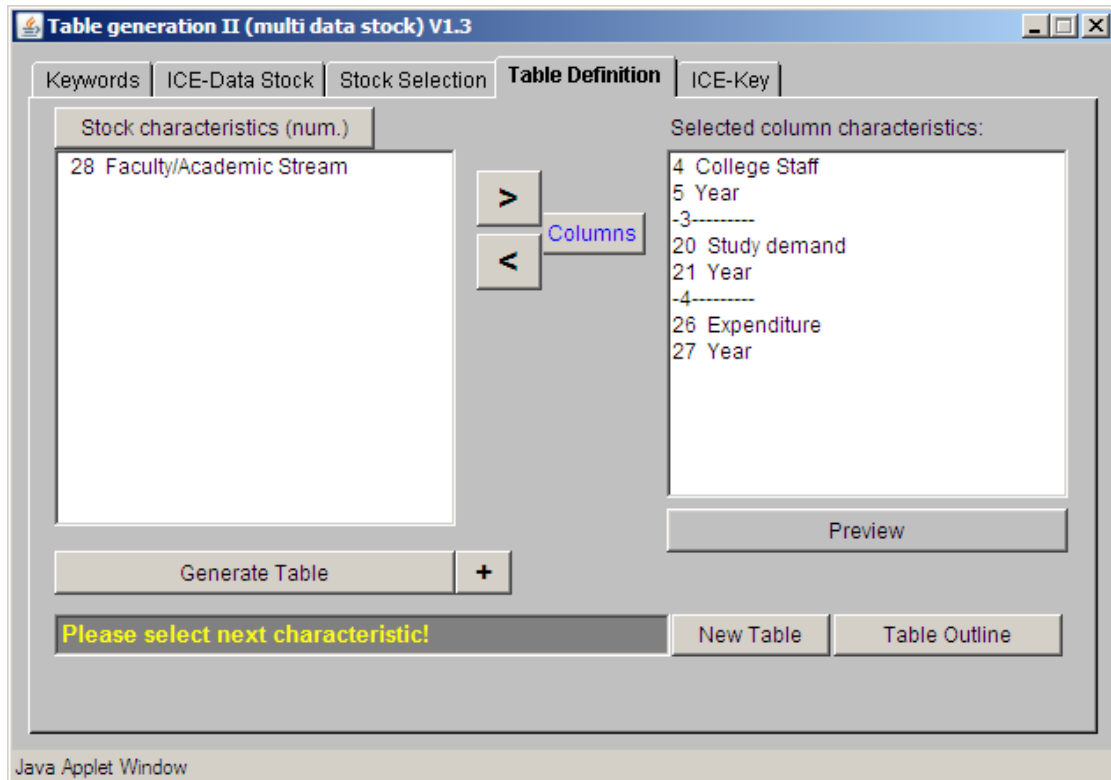


Figure 3.8: Further columns extension



The **Preview** button is a very helpful tool. It allows you to get an excellent overview of the table structure so far.

For the last step of table definition you now insert the next column with the *attribute* “*Recurrent expenditure*”. Useful keywords to find a fitting data stock may be “*Expenditure*” and “*Point in time (annual)*”. Then proceed as normal (see Figure 3.8 on page 41).

When done, click on **Generate Table** to fetch the data from ICE database. This procedure is the same as in *TabGen I* (see 2.2.8).

The view of the final table slightly differs from those tables generated with *TabGen I*. You can identify the individual table units optically. Each has a dimension atop (in our example: “*Number*” and “*Tsd.Rs.*”) (see Figure 3.9 on page 42). Just like at *TabGen I*, you are free to export the table to several formats by simply pressing the corresponding buttons (see Figure 2.21 on page 31).

3 TabGen II – multi data stock table generation

	A	B	C	D
1		Year	Year	Year
2		2005	2005	2005
3		Scientific and creative arts st...	Enroled students	Recurrent expenditure
4	University	Number	Number	Tsd.Rs.
5	Total	4.768	63.355	4.283.131
6	Colombo	474	9.686	503.707
7	Peradeniya	1.036	10.523	916.270
8	Sri Jayawardenepura	445	8.699	405.393
9	Kelaniya	484	7.925	423.483
10	Moratuwa	293	4.028	258.995
11	Faculty/Academic Stream	Number	Number	Tsd.Rs.
12	Total	4.768	63.355	4.283.131
13	Arts & Law	1.243	23.606	901.964
14	Science, Food Sci. & IT	1.080	10.166	848.109
15	Commerce & Management	435	13.529	282.051
16	Engineering & Architecture	628	5.842	462.464
17	Medicine & Dental	721	6.760	886.882
18	Veterinary & Agriculture	405	3.452	294.063

Figure 3.9: Multi data stock table generated with TabGen II

4 TabGen III – the refactoring of multi data stock table generation

Compared to the *multi data stock table generation (TabGen II)*, *TabGen III* provides no new functions regarding content. In simple terms the *refactoring* is nearly the same as *TabGen II*, but equipped with a new surface that is much more handy. The main feature of *TabGen III* is the easy and intuitive handling of the table generation process: use the mouse to “pick up” *characteristics* and *attributes* and simply “drop” them into rows and columns. “Drag-and-drop” is the name of this widely-used method. *Characteristics* can easily be moved between rows and columns or be put back into the pool. The same way *attributes* can be rearranged within a *characteristic*. All the while when being build, the table is getting displayed on the monitor, allowing uncomplicated and direct access to the table layout.



You can build several tables simultaneously that can anytime be accessed by only one click on the corresponding tabs.



Worth knowing: *TabGen III* is a Java Webstart application. For you, this means no more slow loading time when starting table generation. At first starting, *TabGen III* gets installed on your hard disk, and thenceforth gets started from there. Only when there is a new version available, the application again gets loaded from the server.

Remark: This introduction to *TabGen III* does not assume any knowledge on versions *I* or *II*. Therefore you may find text passages whose contents overlap with previous chapters.

4.1 Launching TabGen III

You can start *TabGen III* on the ICE start page. If you did not log in before, you now have to authenticate yourself.

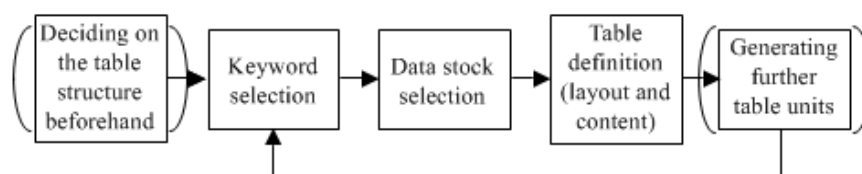


Figure 4.1: The main steps of table creation using “TabGen III”

4.2 Steps of TabGen III

Table creation based on *TabGen III* requires three main steps: *keyword selection* to find data stocks that fit your needs, *data stock selection* from the resulting repertory, and definition of the table concerning layout and content (see Figure 4.1 on page 44).

If you want to generate a table including data from various *data stocks*, you have to repeat these three steps. You are free to add any number of further *table units* to the first one. When running such a *multi data stock table generation*, we strongly advice you to plan it well beforehand because of the rather complex table structure resulting from interrelations among the *table units*. So it might be really helpful to put a draft to paper.

4.2.1 Planning a table structure

For a table based on a *single data stock* it may not be necessary to plan every detail in advance. *TabGen III* features a clearly arranged and flexible user interface for *table generation* leaving plenty of room for testing. If you want to run a *multi data stock table generation*, we highly recommend preliminary planning, and the next text passage may be useful to read.

Multi data stock tables are made up of separate segments (*table units*) that you combine one by one based upon an initial *table unit*. Figure 4.2 on page 45 illustrates the structure of how a table is divided into *table units*.

The table on the figure is made up of six *table units* with overlapping row and column labels (i.e. row label 1 applies to table units 1.1, 1.2, and 1.3). The labels (titles) get generated corresponding to the selected *characteristics* and *attributes*, so they may be quite complex.

The generation of such a table starts with definition of *table unit* 1.1, and in doing so row label 1 and column label 1 get defined for the table on the whole. The next step could either be the definition of *table unit* 1.2 (with predefined row label) or definition of *table unit* 2.1 (with predefined column label). In this way the remaining *table units* follow.

Starting with the second *table unit*, ICE filters the *data stock selection* depending on the *characteristics* and *attributes* of the initial *table unit* (table unit 1.1) because the data stocks of all following *table units* must be able to match the predefined labels.

Let us generate an exemplary table with the following specifications: The initial *table unit* shall include data on “College Staff” as well as on “Year”, both in columns. In

	Column label 1	Column label 2	Column label 3	...
Row label 1	table unit 1.1	table unit 1.2	table unit 1.3	
Row label 2	table unit 2.1	table unit 2.2	table unit 2.3	...
⋮		⋮		

Figure 4.2: Structure of a table consisting of several “table units”

rows we want to compare some Sri Lankan institutions of higher education. So we select *characteristic* “*University*” and choose among the related *attributes*, taking “*Colombo*”, “*Peradeniya*”, “*Kelaniya*”, “*Moratuwa*”, and “*Total*”.

In the second step let us extend the table by rows, with the *characteristic* “*Faculty/Academic Stream*” and the attached *attributes* “*Total*”, “*Art & Law*”, “*Science*”, “*Food Sci. & IT*”, “*Commerce & Management*”, “*Engineering & Architecture*”, “*Medicine & Dental*”, and “*Veterinary & Agriculture*”.

In the next steps we want to extend this table by adding further columns. In the first column we already have college staff data. The next column block shall include student data, and the last column block expenditure data. Further row definitions are not necessary/possible, since the labels of *table unit* 1.1 will be adopted automatically. All in all this makes a total of six *table units* as shown in Figure 4.2 on page 45.

Not later than at this point we have to think about the nature of the data that we intend to compare. To enable sensible comparisons, we need data of similar quality level. So we only use stocks that provide *final data* by the Sri Lankan University Grants Commission. In general we have furthermore to take care about the *point in time*. Some data, like data on students, may refer to semesters and others to years. For our example let us compare data of the year “2005”.

4.2.2 Defining a table

Initially the exemplary table shall include data on college staff at some random chosen Sri Lankan universities for the year 2005. We build the table in three steps as follows:

4.2.2.1 Keyword selection

Before we start the practical work on our exemplary table, the next passages deliver some basic information on the search by *keywords*.

The *keywords* reflect the complete *characteristics*- and categories-stock of the *ICE-key* system. Some keywords represent *characteristics* (e.g. *gender*), others indicate *attributes* (e.g. *male* is an attribute of characteristic *gender*). Both types of keywords include different conceptual ranges. For instance the keyword *gender* covers several attributes (*male*, *female*, and *total*), while the keyword *male* directly sticks to one single attribute.

For another example, the keyword *Subject groups* refers to the characteristic of the same name. The related attributes range from *Art* to *Veterinary medicine*. For such terms that embrace a variety of attributes, ICE uses so called “or-connections” for related attribute names (i.e. the output of a stock search contains all stocks that include at least one fitting attribute), whereas in general “and-connections” are applied among keywords (i.e. search results show only those stocks that fit to all given keywords). For example, if you are looking for data about *Enroled students*, *Leave of absence*, and *New entrants*, you can search by the keyword *Study demand* that embraces all of these terms (among others), or you can select each term separately as keyword. All existing keywords are related to at least one ICE-key in a similar way.

When you start *TabGen III* on the ICE start page, a **Java Console** window opens, followed by the window with the *TabGen III* user interface (see Figure 4.3 on page 47) that initially contains an empty table generation. The search for a fitting *data stock* gets initiated, starting with the *keyword selection*. The window mainly consists of two big boxes; on the left: box **Available Keywords**, and on the right: box **Selected Keywords**. ICE calls up all available *keywords* from the database. They get alphabetically listed in the left box. By selecting some of these *keywords*, you can narrow down the number of *stocks* that you later will use for data search. ICE provides you with *data stocks* that suit all chosen *keywords* (“and-connection”).

How to add *keywords* to the list **Selected Keywords**: Under the header **Available Keywords** you find a dialog box, in which you can type the word you are looking for. If a fitting *keyword* is available, it automatically gets displayed in the list. There are three ways to select a *keyword*: via double click on any *keyword*, and when a *keyword* is highlighted via the enter key or the **rightwards arrow** button.



You can manually scan the list with the scrollbar on the right margin of the box, or the scroll wheel of your mouse. *Keywords* can be highlighted via mouse click. With the keys CTRL or SHIFT keeping pressed, you can highlight several keywords at once.

You can remove selected *keywords* by first highlighting them in the right box, and then clicking on the **leftwards arrow**. The **double arrow** clears the whole list.

After finishing the *keyword selection*, click on **Next** to start the *stock search*.



If you know which *data stock* you want to use beforehand, you can directly access the list of all *data stocks* without the need to select *keywords*. For doing so,

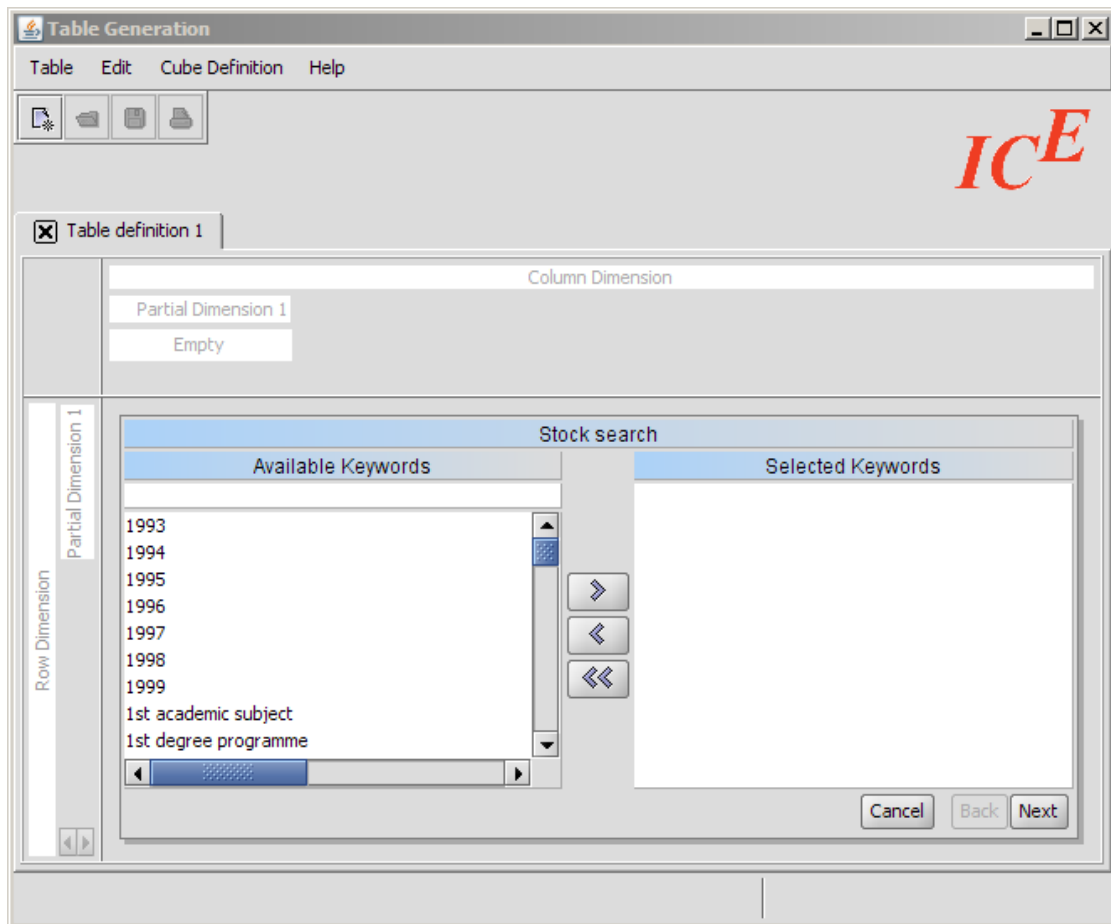


Figure 4.3: The user interface of TabGen III

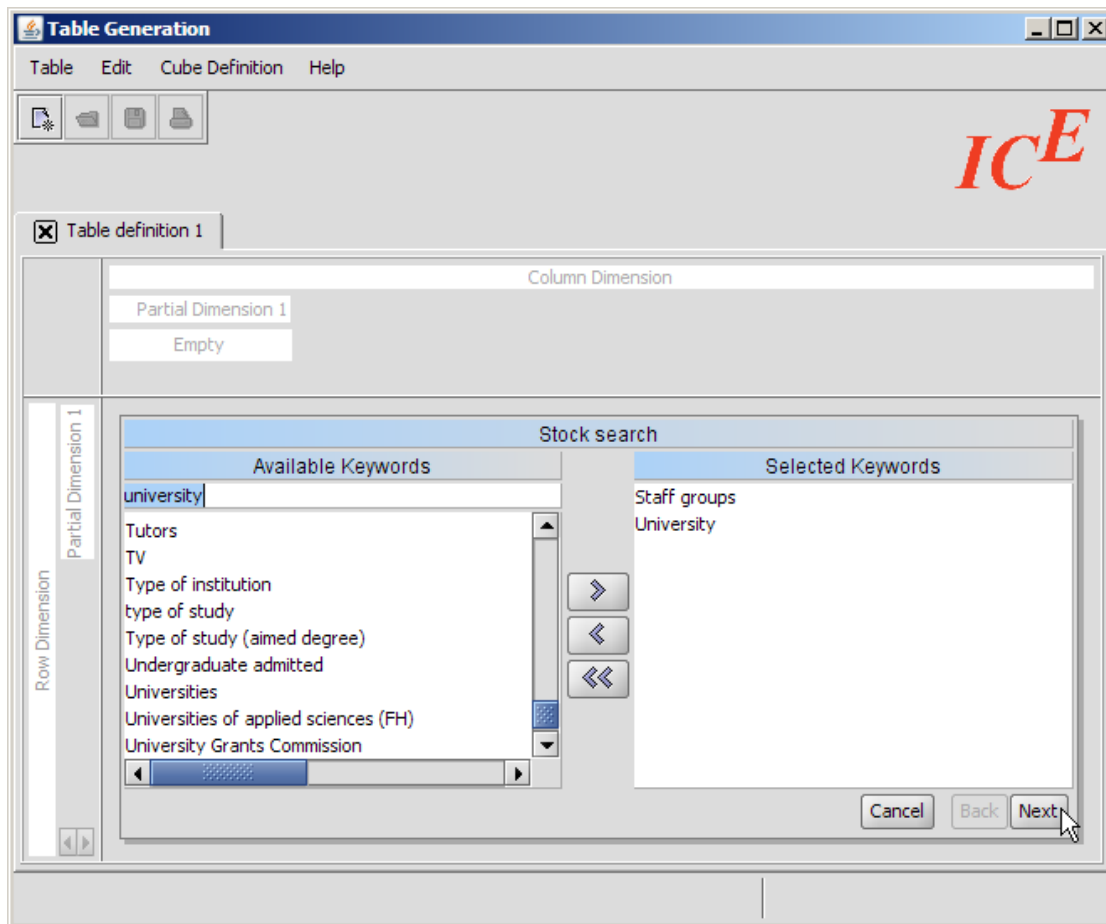


Figure 4.4: Selection of keywords “Staff groups” and “University”

clear the whole list of **Selected Keywords** (using the **double arrow**), and click on **Next**. Then you can select the *stock* you want to by the *stock* id number.

For the exemplary table please select the *keywords* “Staff groups” and “University” (see Figure 4.4 on page 48).

4.2.2.2 Data stock selection

After sending the *keywords*, in the left box you see a numerical list of those *data stocks* that fit to all chosen *keywords*. If no fitting *data stock* is available, a corresponding message pops up; then select **Back** to return to *keyword selection*.

How to find the *data stock* in the numerical list: click on a stock id number to open a tree structure in the right box containing all *characteristics* of that stock. In addition you see information about this stock’s *data source*, *notation* and *data quality*. With a double click on a *characteristic*, you expand the tree structure to a list of the

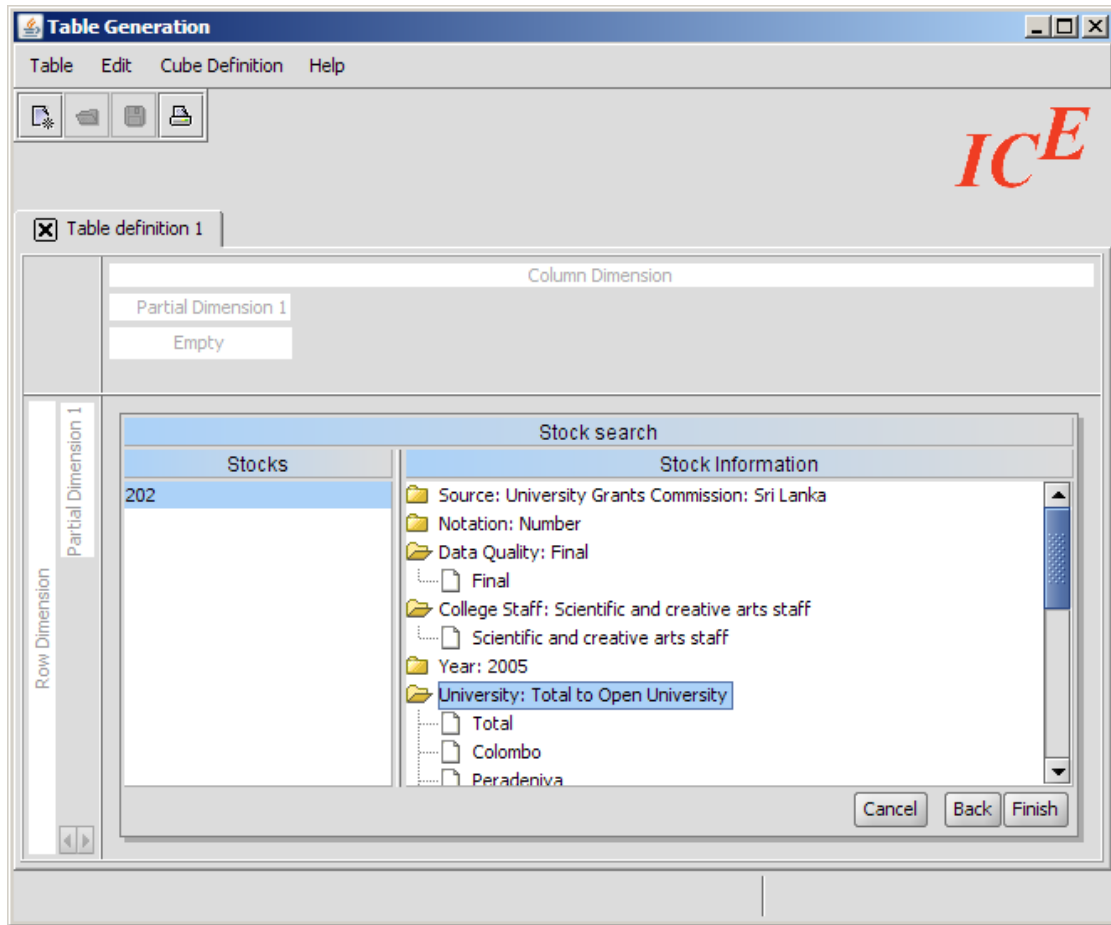


Figure 4.5: Data stock selection using TabGen III

corresponding *attributes*. So it is easy for you to find out whether one of the provided *data stocks* contains the right set of data. If not, select **Back** and modify the list of **Selected Keywords** for a new search request. When you find a fitting *stock*, highlight its id number and click on **Finish** (see Figure 4.5 on page 49).

For our exemplary table, please make sure that the following *attributes* are available: “Colombo”, “Peradeniya”, “Kelaniya”, and “Moratuwa” of *characteristic* “University”; “2005” of *characteristic* “Year”; “Scientific and creative arts staff” of *characteristic* “College staff”.

4.2.2.3 Table structuring

The “drag-and-drop” method allows intuitive table building using the *characteristics* and *attributes* of your selected *data stock*. You find the *characteristics* listed in the left box of the program window (see Figure 4.6 on page 50). Use the two buttons that are located above this box to switch the list between alphabetical and numerical order. When you

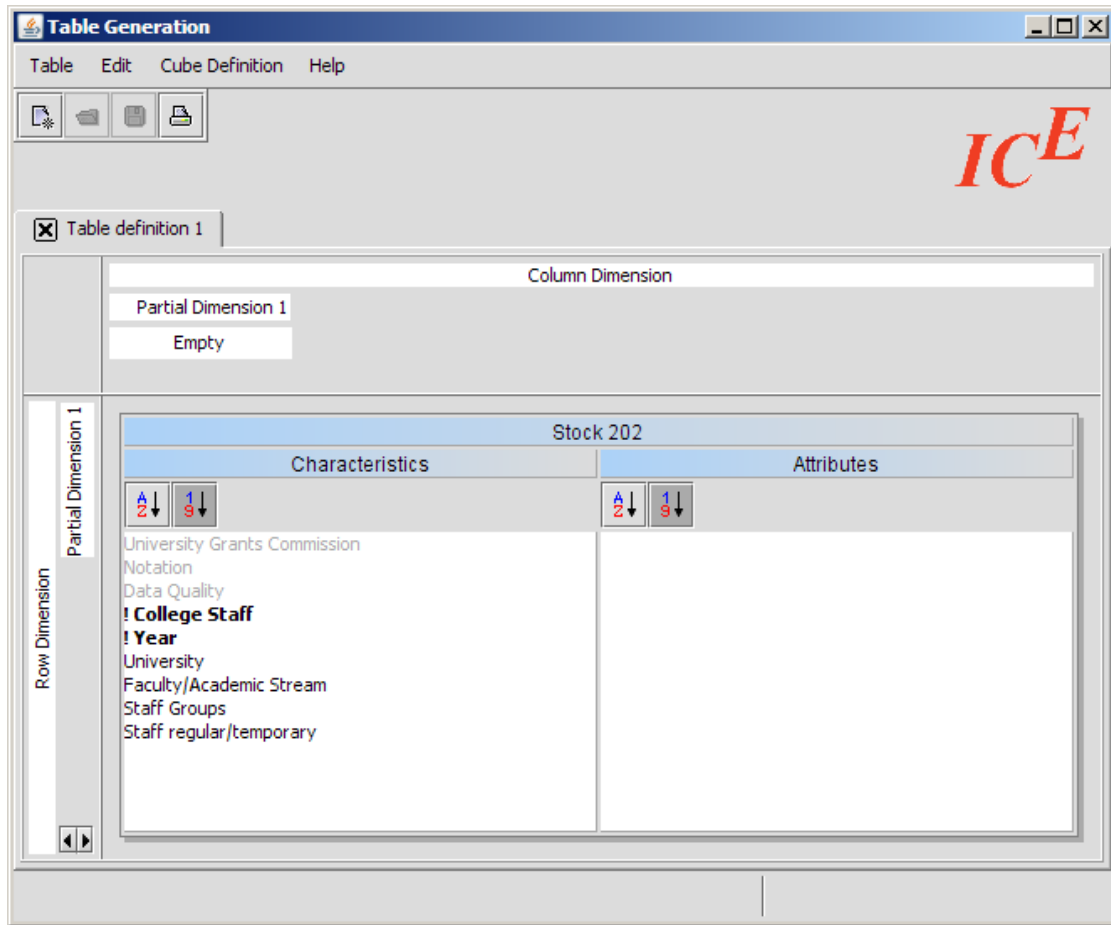


Figure 4.6: Flexible table structuring with TabGen III

highlight a *characteristic* with the mouse, the corresponding *attributes* get displayed in the right box. On the left to and above of the two boxes you see a preparatory drawing of the table, each side with three fields carrying the following labels: **Row / Column Dimension**, **Partial Dimension 1**, and **Empty**. Into the **Empty** fields you now can either drop *characteristics* and/or *attributes* (if you drop a *characteristic*, all of its available *attributes* are included). To remove *attributes*, just “pick” them up with your mouse (either individually or grouped), and put them back into the pool. The same way you can remove *characteristics* along with all attached *attributes*. By “picking” and “dragging” you can sort *characteristics* and *attributes* across rows and columns. Instead of using *characteristics* you can directly drop *attributes* into the table structure (again: individually or grouped).

Important: Every *data stock* contains *obligatory characteristics* that must be used for the table structure due to reasons concerning content (see 4.2.2.3). You can recognise *obligatory characteristics* by a prefixed “!”.

The boxes **Characteristics** and **Attributes** are freely adjustable in size, so you can easily keep a clear view on the table structure so far. For this purpose click on the lines between the boxes and the preparatory table drawing; with the mouse button kept pressed you can move the lines to get the size you like to have.



Anytime during table generation, you can print an overview of the currently selected *data stock* and all its attached *characteristics* and *attributes*, by clicking on the button showing the printer icon.



“!” – *Obligatory characteristics* at table generation: At table definition there are *characteristics* that must be included in the table structure. It does not matter whether they are assigned to rows or to columns. This “restriction” is required because of reasons regarding content: For example, nearly all ICE-data are related to time, and it would not make any sense to define numbers of *enroled students* or of *staff positions* without stating concrete time references. So normally at table generation you have to select a time related *characteristic*. Furthermore there are those characteristics that do not have the *total* attribute. For some characteristics a total of its attributes would be senseless (to sum up *enroled students* and *new entrants* would not result in any useful information because these attributes have intersections). When searching for proper data to satisfy incompletely defined data requests, the system automatically sets attributes of those characteristics to *total* that appear in stock description but not in table structure. For instance many stocks contain the subcategorization *gender*. When this characteristic is not included in the table structure, the system considers this subcategorization as not wanted, and so it adopts the attribute *total* for the characteristic. Characteristics that have multiple attributes but not the attribute *total* are obligatory and must be included in the table structure.



Obligatory to select, too, are some *characteristics* that define *topic areas*, even though these only have one attached *attribute*. In our example this is *characteristic* “College Staff”. This is due to the reason that other *characteristics* (like “Staff regular/temporary”) can only be well-defined in connection with this specification.

To our exemplary table: For the initial *table unit* you have selected a *data stock* with the *characteristics* “University”, “Year”, and “College staff” (all with certain attached *attributes* – as described above). Now, please highlight *characteristic* “Year” and put *attribute* “2005” into the field **Empty** underneath header **Column Dimension**. As you can see, the table begins to shape. The next *characteristic* shall be “College Staff” with attached *attribute* “Scientific and creative arts staff”; please put this right under

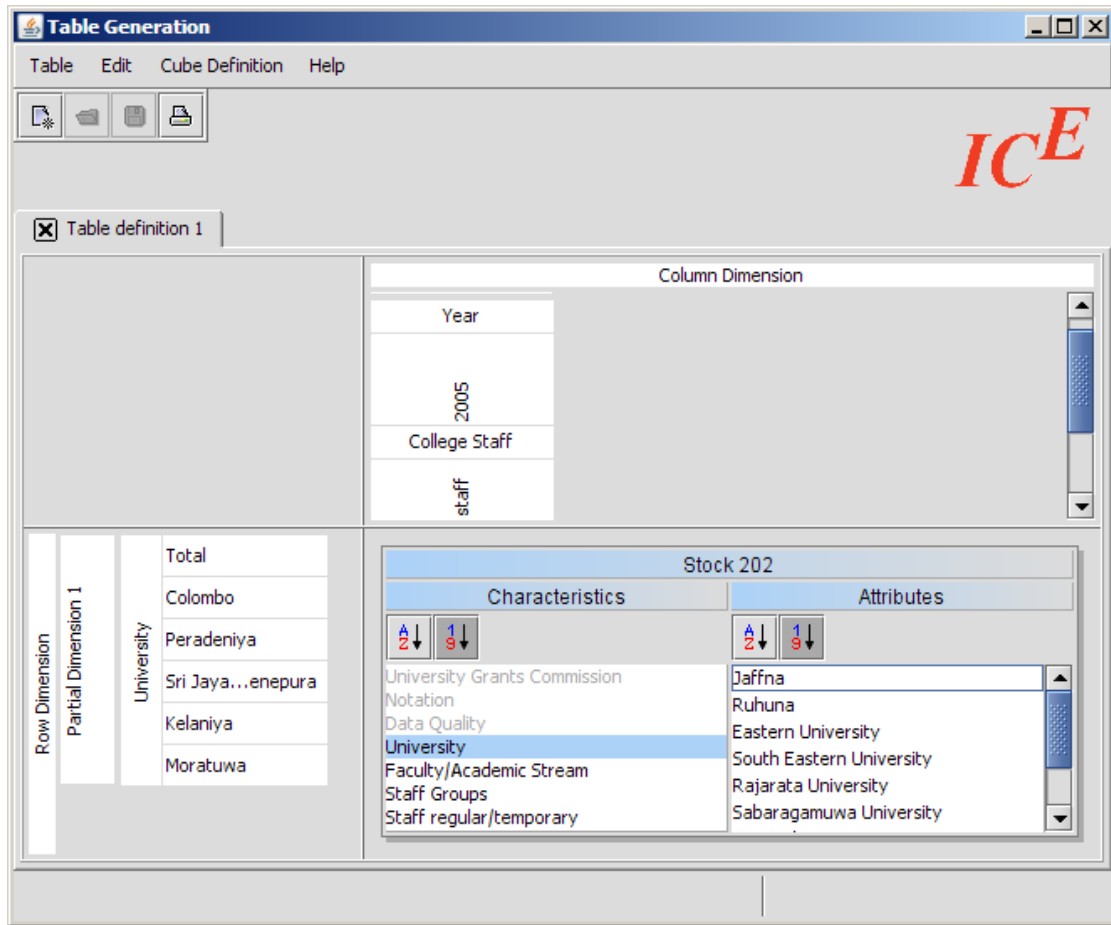


Figure 4.7: Table structure with integrated characteristics and attributes

the “Year”. In rows please put “Universities” and sort from top to bottom the *attributes* “Total”, “Colombo”, “Peradeniya”, “Kelaniya”, and “Moratuwa”. The remaining *attributes* can be put back into the pool (see Figure 4.7 on page 52).

The initial table now is completed, and you could go on to Section 4.3 for showing and exporting the table, or you could define further *table units*.

4.2.3 Table extension by definition of further table units

If you want to extend a table by adding more *table units* (that may even base on another *data stock*), go to the program menu and select **Cube Definition > Table Extension**. Here you can choose between extension via **New Rows** or **New Columns**. The next steps will again be *keyword selection* followed by another *stock selection*. After deciding for the next *stock*, you can add a new *table unit* to the existent initial *table unit*. You are free to add any number of further *table units*, and in this way you can build very large and complex tables. Please notice that *multi data stock table generation* requires

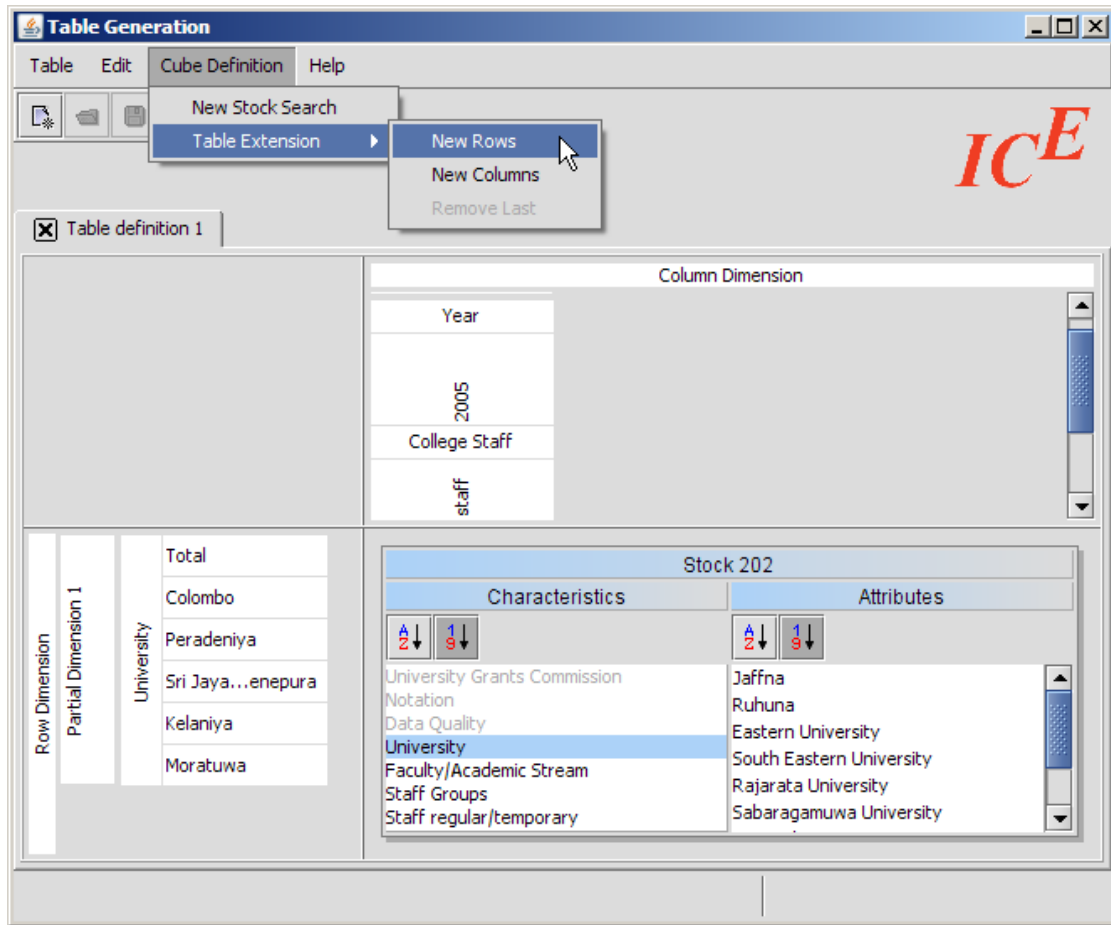


Figure 4.8: Table extension by rows

detailed planning of the table structure beforehand (see 4.2.1). Further row and column labels must match those of previous build *table units*; at further stock selections, the ICE system only provides data stocks that fit this needs.



Please note that you only can rearrange *characteristics* and *attributes* among rows and columns of the current table unit. Already built table units are considered as completed and are not open to alterations anymore, unless you delete all later build *table units* – that is only possible in reversed order of the sequence you built them (menu: **Cube Definition > Table Extension > Remove Last**).

Firstly we want our exemplary table to be extended by rows (menu: **Cube Definition > Table Extension > New Rows**) (see Figure 4.8 on page 53). At *keyword selection* enter “Faculty/Academic Stream”, and then select a fitting *data stock*. Then, underneath

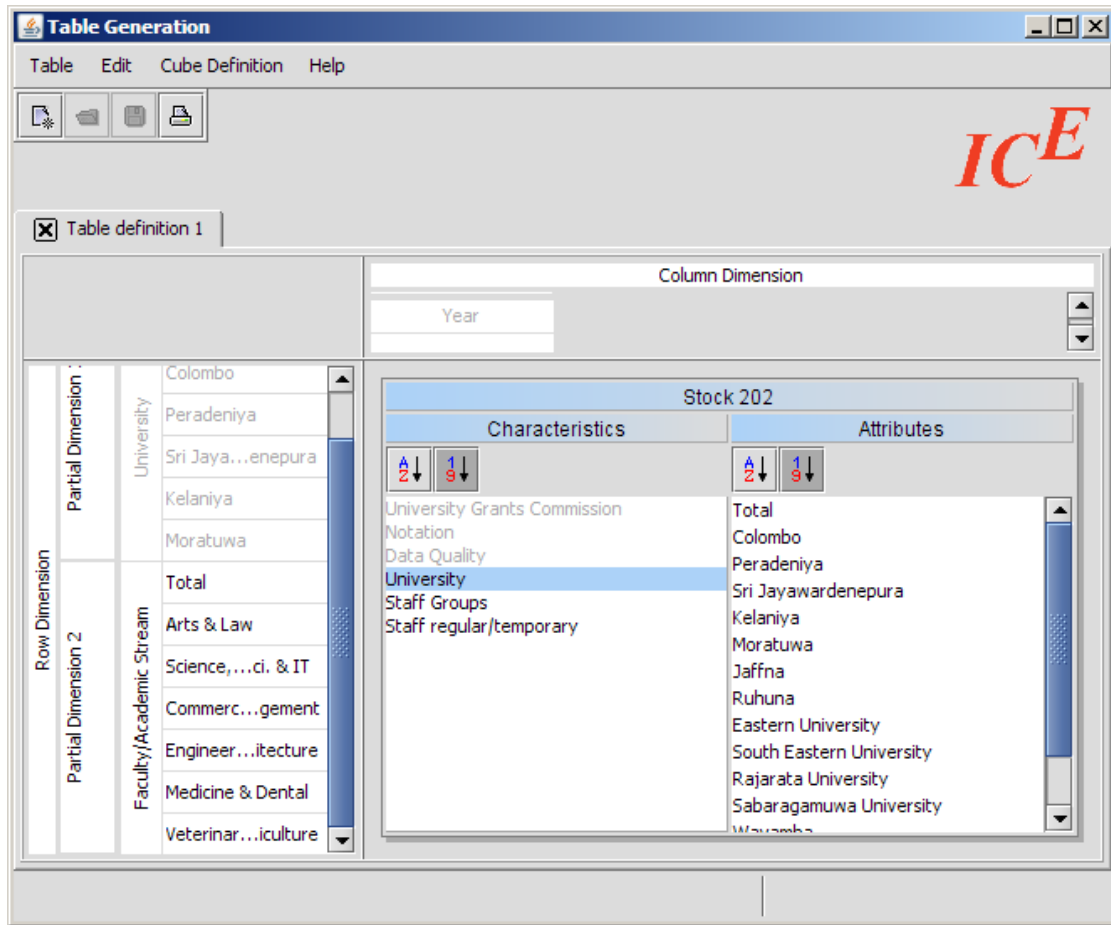


Figure 4.9: This table has been extended by rows

of the initial *table unit*, place *characteristic* “Faculty/Academic Stream” with *attributes* “Total”, “Art & Law”, Science, Food Sci. & IT”, “Commerce & Management”, “Engineering & Architecture”, “Medicine & Dental”, and “Veterinary & Agriculture” (in this order, please) (see Figure 4.9 on page 54).

The rows definition now is completed. The second table extension will be by columns, and due to the two existing rows units, this time you will build two new *table units* at once (units 1.2 and 2.2, see Figure 4.2 on page 45). As keywords select year “2005” and “Enroled students”, and after selecting a *data stock* (take care of the existing rows *attributes*), include these *attributes* in the table.

At last make another column extension, and add again the year “2005” and “Recurrent expenditure” (*keyword*: “Expenditure”) (see Figure 4.10 on page 55).

Now you should have completed the table structure corresponding to Figure 4.2 on page 45, and the time has come to include the data values. You can choose among four formats to show the table.

Figure 4.10: The table structure is complete

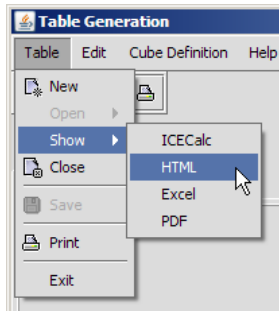


Figure 4.11: Show table: select among four formats

4.3 Show table

Anytime during table generation you can export tables to certain formats (from completed tables as well as tables still under construction), provided that all *obligatory characteristics* have been included, that rows and columns each have at least one attached *characteristic*, and a current table extension must be extended by at least one *characteristic*, too. You can run an export via the program menu: **Table > Show**. There you choose among four formats: **ICEcalc**, **Excel**, **HTML** and **PDF** (see Figure ?? on page ??-select-format:).

ICEcalc is a spreadsheet application that is integrated in the ICE system. With *ICEcalc* you can run calculations on your tables (see Chapter 7).

In case that you use Microsoft Excel or another spreadsheet that can read XLS-files, you can directly export tables generated with ICE to those programs for any further processing. For an Excel window automatically be opened, your browser needs a certain set up. Normally this is given in the default settings.

In a similar way you can convert your generated tables to HTML and PDF formats. Since all browsers can display HTML, you need no special set up for this. For using PDF-files you need a corresponding application, like Adobe Reader.

5 Standard tables

Tables that are defined as *standard tables* have a special format featuring an automatic update function (see Section 5.2). *Standard tables* can be exported to PDF, and HTML formats, and to spreadsheets like OpenOffice Calc or MS Excel. You can either create *standard tables* by yourself, or you can access the *standard table libraries* that are provided by ICE (see Section 5.5). Use the *standard table management* to create and save new libraries. There you can compile your self-made *standard tables* and those provided in the ICE database (see Section 5.3).

5.1 Creating a standard table

5.1.1 Creating a standard table with TabGen I and II

At *TabGen I* and *II*, after being finished with the *table generation*, as discussed in the preceding chapters, the new build table can be converted to various formats. You can select among the following possibilities by simply clicking on the corresponding buttons on the window (Fig. 5.1):

- convert to **Excel**
- convert to **HTML**
- convert to **PDF**
- create a **Standard** table

Click on **Standard** to open window Figure 5.2 on page 58:

You have to decide on several specifications that are required for the creation of standard tables:

- The window displays the title which you have chosen at *table generation*.
- The table gets automatically assigned to an *topic area* that derives from the *data stocks* being used with the table.
- In the next field you can select a *library*, or you can switch to *standard table management* to create a **New library** (see Section 5.3).
- To get an overview of the tables in the libraries, highlight a library and click on **Table list**.

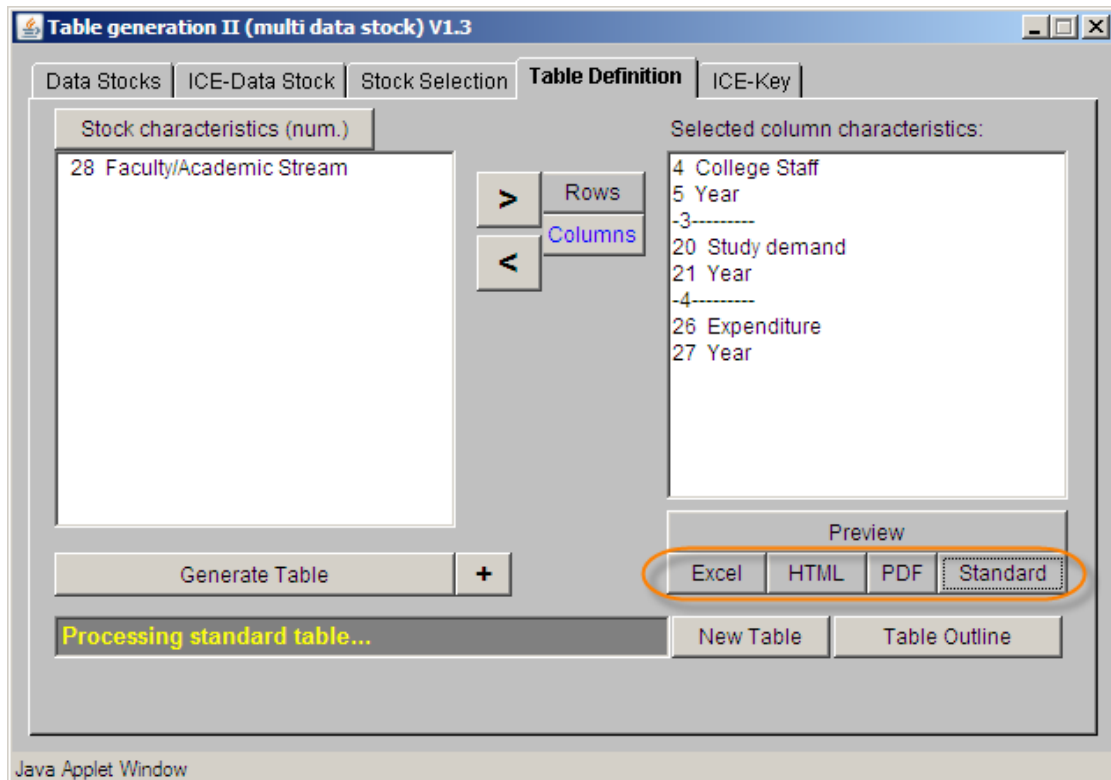


Figure 5.1: Further table export formats selection

Save standard table

Library | Update | Permission | Overview

New table (basic title):
 College Staff (Scientific and creative arts staff) by University, Year (2005) [TabTeil 2]: by Faculty/Acad

The new table automatically will be assigned to the following area:
 Cross-areal tables

Please choose the library you want the table to be assigned to:
 exemplary tables
 Frie
 Hochschulstatistik (HIS)
 MuTra
 Neue Sammlung
 Peters Test Tables

Selected library:

Table list | New library | Info

Where required change table title
 College Staff (Scientific and creative arts staff) by University, Year (2005) [TabTeil 2]: by Faculty/Acad

Change table title | Supplement

The dialogue template now is available!

Next >>

Java Applet Window

Figure 5.2: Window with the information needed for standard table creation


- Eventually you have another opportunity to change the title of your *standard table*. Select the corresponding button and edit the *table title* in the new opened window.

Click on **Next** to go to the following tab (see Figure 5.3 on page 60). Here you can select an *update type* (for more information see below).

Next for the following tab. Here you can define read and write permissions for the *standard table* (see Figure 5.4 on page 61)

Finally you reach the **Overview** (see Figure 5.5 on page 62) that displays all chosen specifications and settings. Select **Save table** to complete the standard table generation.

5.1.2 Creating a standard table with TabGen III

After showing (exporting) a table in one of the formats as mentioned in Section 4.3, it is possible to save it as *standard table*. Go back to the table generation window, and click on the icon showing the floppy-disk  to start the **Save standard cube** dialogue (see Figure 5.6 on page 63) .

The dialogue has three tabs. On the first tab you can edit the table title, and you may include a header and/or footer text. For doing so just click on one of the corresponding boxes and use your keyboard for the entries. Click on the next tab.

Here (see Figure 5.7 on page 64) you can define read and write permissions for the *standard table* (see Figure 5.7 on page 64) . Click on the next tab.

Here (Figure 5.8 on page 65) you can select an *update type* (for more information see 5.2). Click on the **Next** to continue.

On this window (see Figure 5.9 on page 66) you can select a library you want your *standard table* to be saved in. Click on **Next** to continue.

This is the **Summary** (see Figure 5.10 on page 67). Here you can revise your chosen settings, and finally you can **Save** the *standard table*.

5.2 Standard table update

Let's assume that you have a *standard table* containing data on the year 2004, and you come to know that now there are data available up to 2005. The **standard table update** feature enables you to expand the table automatically. You can find this feature on the start page of the ICE system under **Update**.

First select one or more libraries and click on **Compile Tables** (see Figure 5.11 on page 68).

The next tab (see Figure 5.12 on page 69) displays the corresponding tables. **Start update** starts the update process.

The third tab **Standard tables - updated** lists the successfully edited tables. Figure 5.13 on page 69 shows an exemplary pre-existing table and Figure 5.14 on page 70 the altered table after the update process.

Standard tables can only be updated correctly if they were assigned to an *update type* during the generation process (see above). You can read some explanatory notes to the different update types in the **Update types** tab of the *standard table management*.

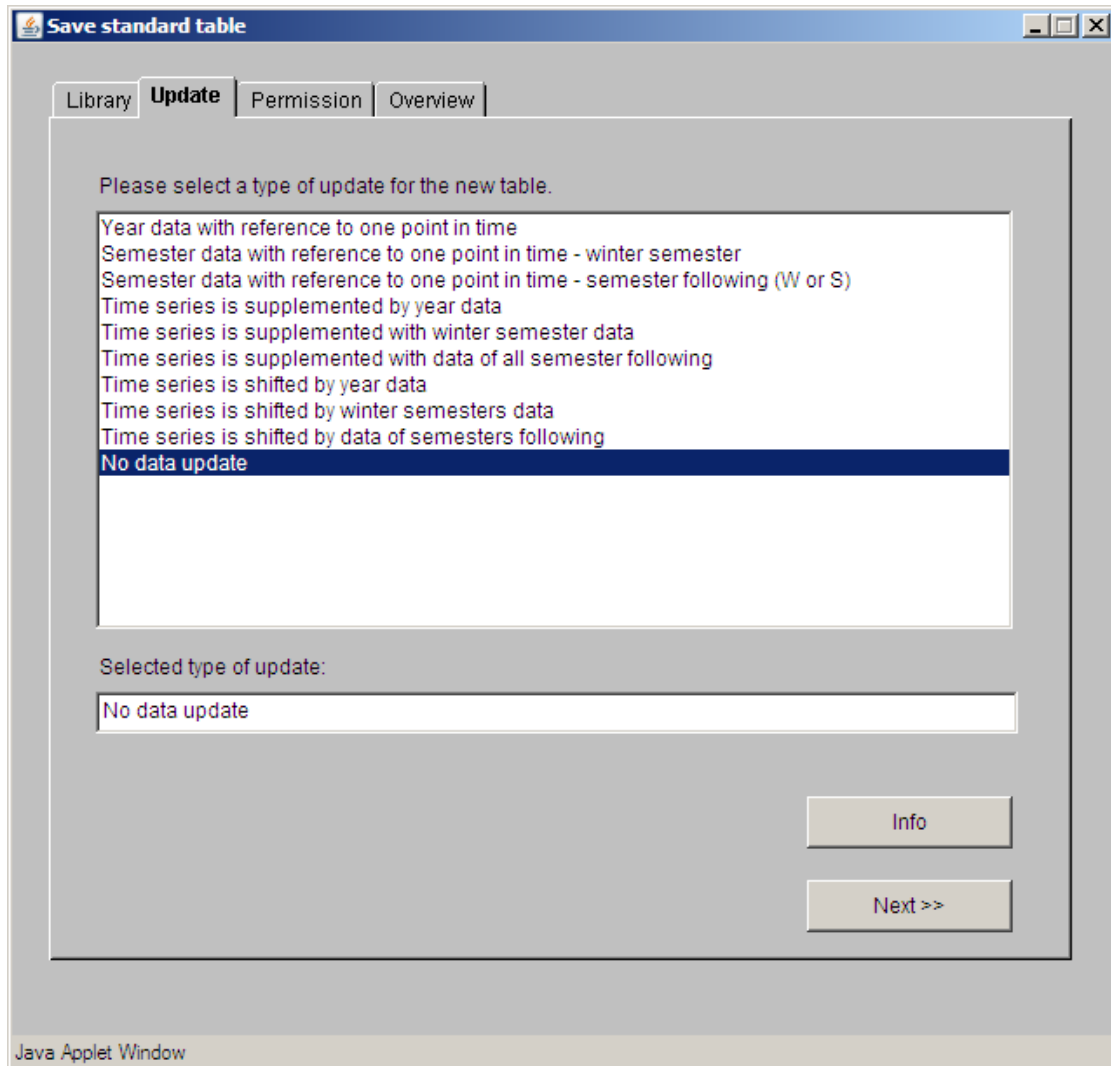


Figure 5.3: Select an update type for standard table creation

Save standard table

Library | Update | **Permission** | Overview

Set table authorisations:

For the table that you have generated you have read and write permission.
To protect this table against unauthorised access, you have the possibility
to grant further authorisations.

User authorisation inside the own group:

☐ Read permission
☒ Write permission (enables to edit table)
☐ No access

User authorisation outside the group mentioned above:

☒ Read permission
☐ Write permission (enables to edit table)
☐ No access

Java Applet Window

Figure 5.4: Window for setting standard table authorisations

The screenshot shows a Java Applet Window titled "Save standard table". It has four tabs: "Library", "Update", "Permission", and "Overview", with "Overview" being the active tab. The window contains several text input fields and two buttons at the bottom right.

Table:
 College Staff (Scientific and creative arts staff) by University, Year (2005) [TabTeil 2]: by Faculty/Acad

Table authorisation:
 Write permission For the group / Write permission For all users

Type of update:
 No data update

Library:
 exemplary tables Table overview of the library

Library authorisation:
 Compiled by frie / Write permission For the group / Read permission For all users

Area:
 Cross-areal tables

Close Save table

Java Applet Window

Figure 5.5: Settings overview of the standard table generation

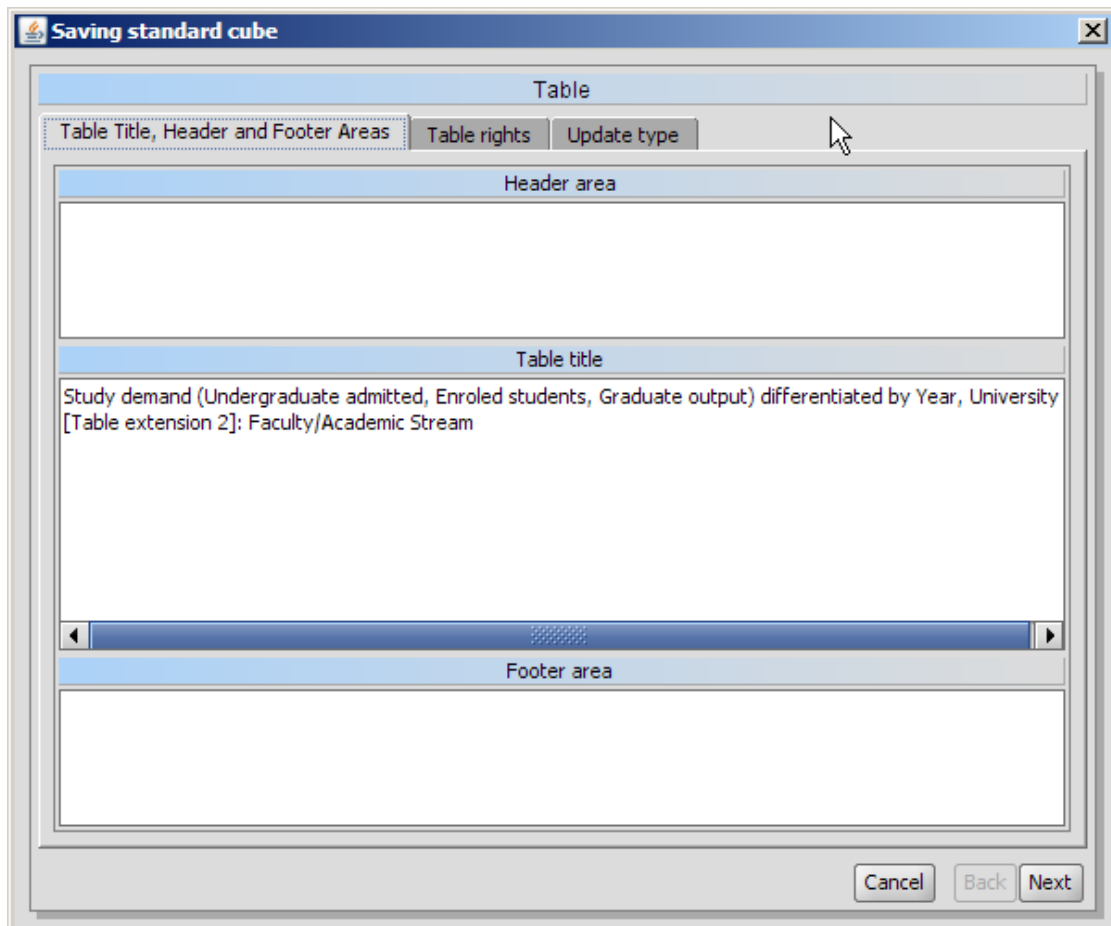


Figure 5.6: Save standard table dialogue - edit title, header/footer

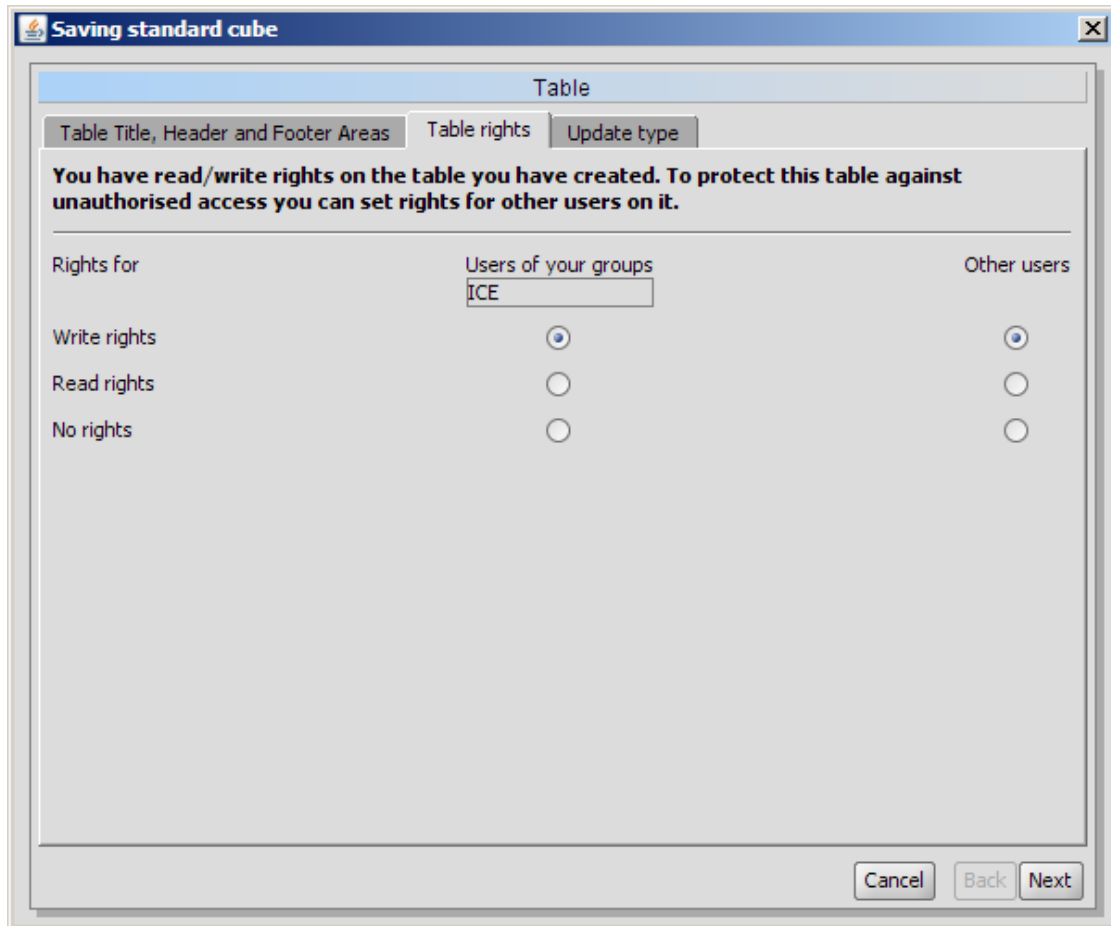


Figure 5.7: Save standard table dialogue - read/write permission

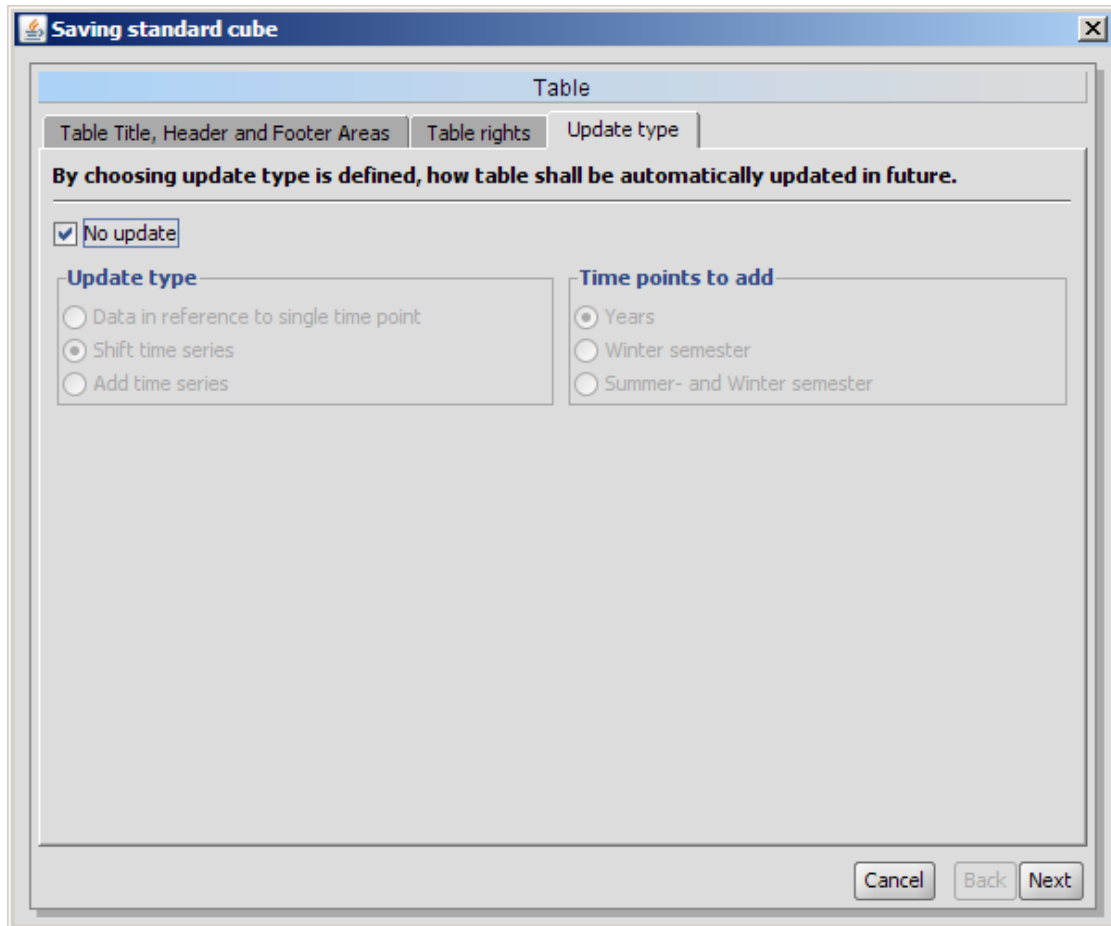


Figure 5.8: Save standard table dialogue - read/write permission

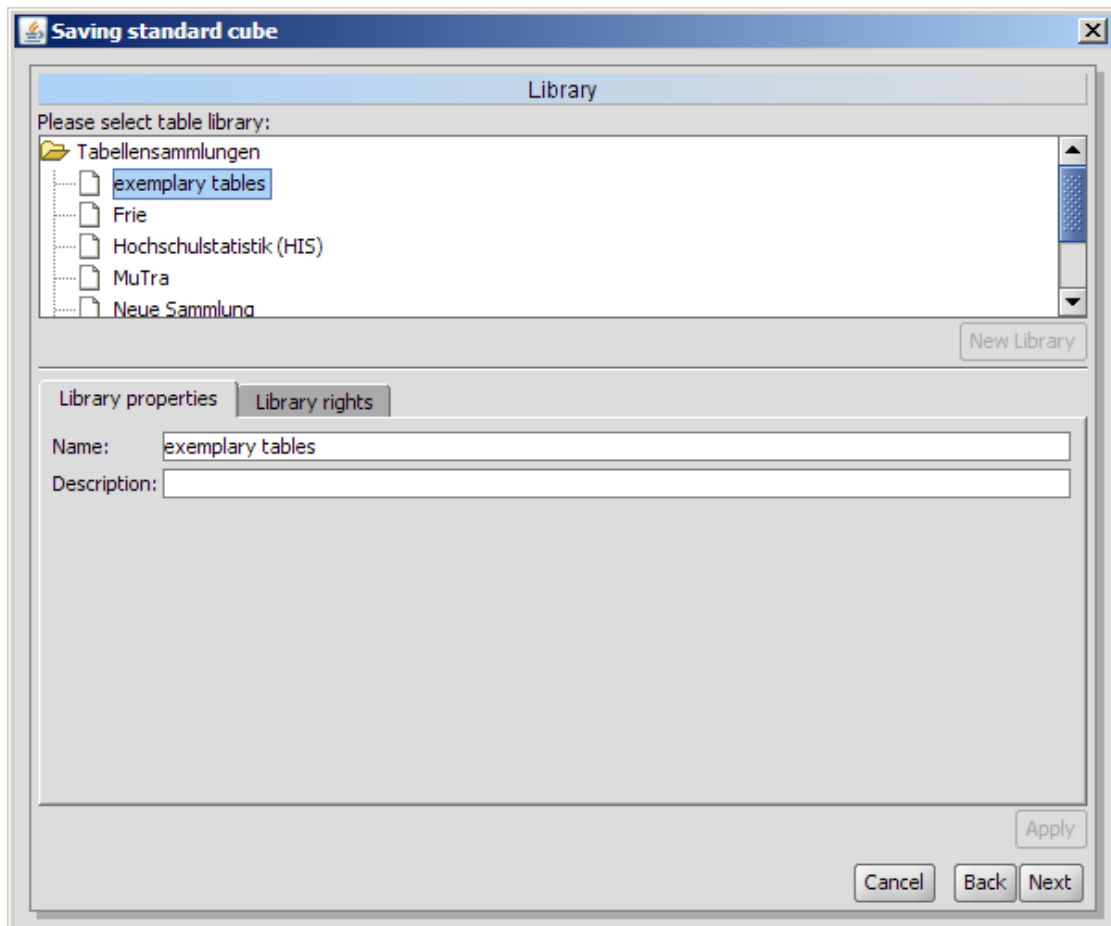


Figure 5.9: Save standard table dialogue - library selection

The screenshot shows a Windows-style dialog box titled "Saving standard cube". It has a tabbed interface with three tabs: "Header area", "Table title", and "Footer area". The "Table title" tab is currently selected. The text in this tab reads: "Study demand (Undergraduate admitted, Enroled students, Graduate output) differentiated by Year, University [Table extension 2]: Faculty/Academic Stream". Below the tabs, there are several sections for configuring the table. The "Rights on table" section includes fields for "Write rights for my groups:" (containing "ICE") and "Write rights for other users". The "Update type:" is set to "No data update". The "Library:" is set to "exemplary tables". The "Rights on library" section includes fields for "Created by user:" (containing "frie"), "Write rights for groups:" (containing "ICE"), and "Read rights for other users". The "Topic area:" is set to "Bereichsübergreifende Tabellen". At the bottom right, there are three buttons: "Cancel", "Back", and "Save".

Saving standard cube

Summary

Header area Table title Footer area

Study demand (Undergraduate admitted, Enroled students, Graduate output) differentiated by Year, University
[Table extension 2]: Faculty/Academic Stream

Rights on table

Write rights for my groups: ICE

Write rights for other users

Update type: No data update

Library: exemplary tables

Rights on library

Created by user: frie

Write rights for groups: ICE

Read rights for other users

Topic area: Bereichsübergreifende Tabellen

Cancel Back Save

Figure 5.10: Save standard table dialogue - summary

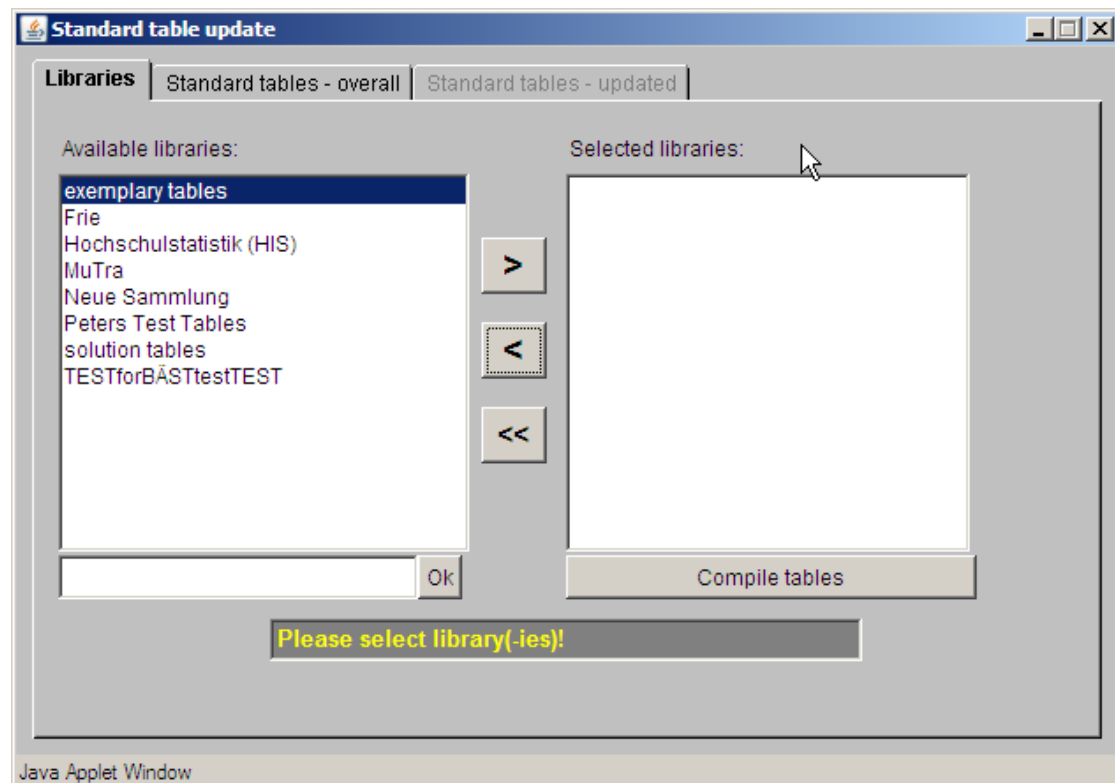


Figure 5.11: Window for standard table update: Selection of libraries that contain tables to be updated

5 Standard tables

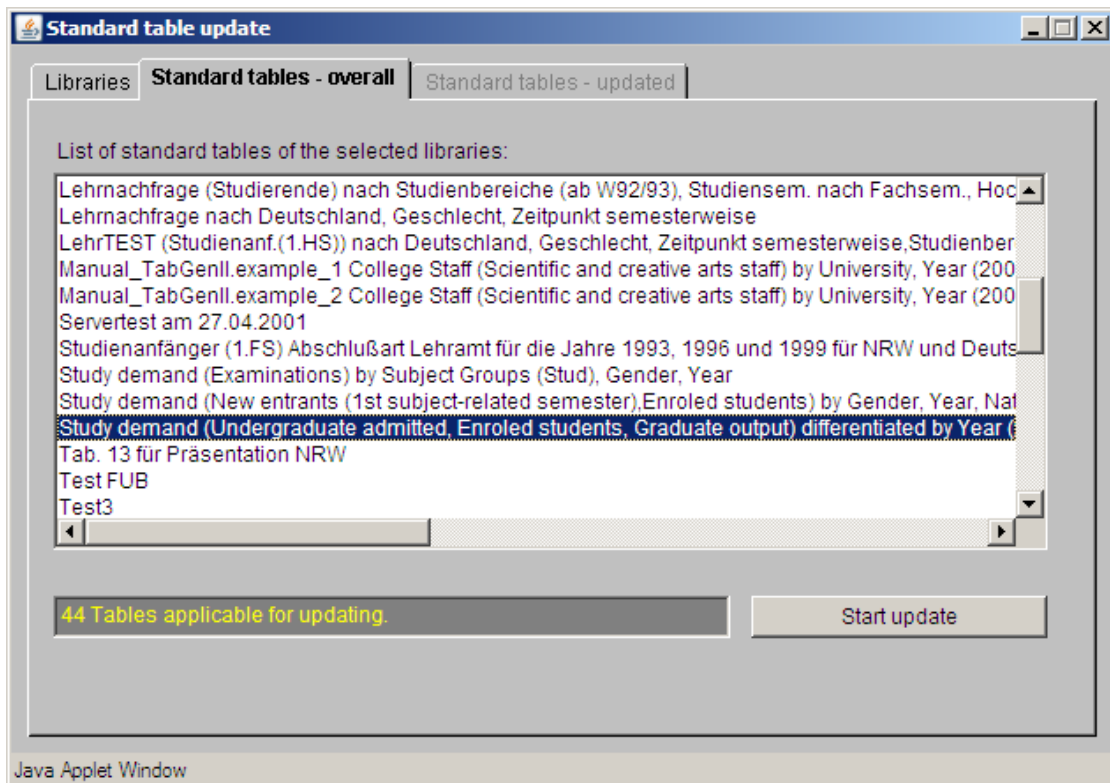


Figure 5.12: Overview of the tables ready for updating: one table has been selected

	Year
	2004
	Enroled students
University	Number
Total	62.407
Colombo	8.784
Peradeniya	9.903
Sri Jayawardenepura	9.376
Kelaniya	8.110
Jaffna	4.640

Figure 5.13: Example: pre-existing table

5 Standard tables

	Year	
	2004	2005
	Enroled students	
University	Number	
Total	62.407	63.355
Colombo	8.784	9.686
Peradeniya	9.903	10.523
Sri Jayawardenepura	9.376	8.699
Kelaniya	8.110	7.925
Jaffna	4.640	4.452

Figure 5.14: Example: updated standard table

A subsequent modification of the *update type* is possible, too. In the *standard table management*, go to **Show tables** and then click on **Structural info**.

In general we speak of three basic *update types*:

1. **Updating in reference to a point in time**

This type replaces all data of the table (let's assume the table was generated for the year 2005) by the newest available data of the system (e.g. for the year 2006).

2. **Time series supplementation**

According to the table structure the data in rows and in columns gets supplemented by more current data. By using this type of updating, the table grows in size.

3. **Time series displacement**

According to the table structure new data gets implemented in rows and in columns, while old data gets removed (to a corresponding number). The table size does not change.

For all three general types you have to decide, whether you want to use annual data, or data for semesters.

5.3 Standard table management

5.3.1 Creating an own library

For installing an own library, go ahead as follows:

- On the ICE start page, select **Table management**. The following window appears (see Figure 5.15 on page 71).
- Click on **Create new library**.
- An new window pops up. Here you can enter a name for the library and define read and write permissions. Confirm your selections by clicking on **Create library**.

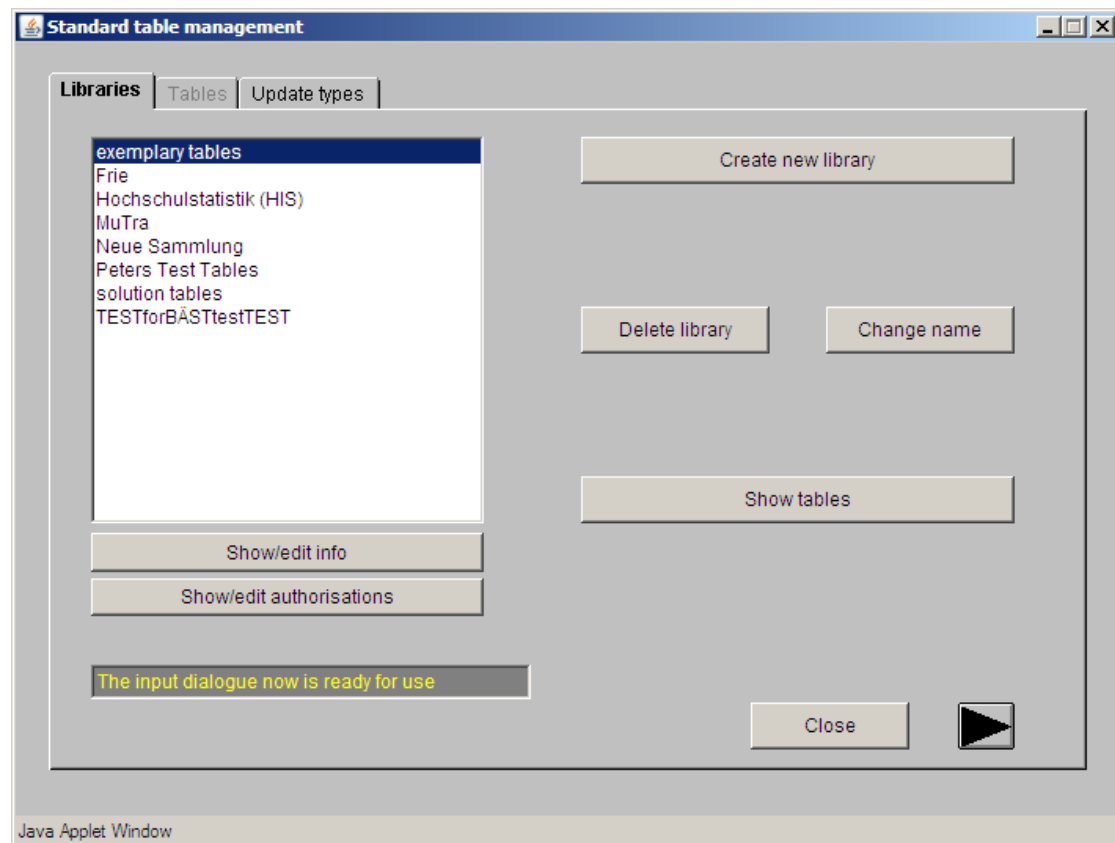


Figure 5.15: Main window of standard table management

More functions of the standard table management:

Deletion of libraries Highlight a library in the list, click on **Delete library**, and confirm with **Yes**.

Change library name Highlight the name of a library in the list and select **Change name**. Fill in the new name in the input box and save it with **Enter**.

Brief description Under **Show/edit info** you can read and edit notes to a highlighted library.

User authorisations Highlight a library and select **Show/edit authorisations** to edit read and write permissions.

5.3.2 Table management of one library

To get a list of all tables that belong to a highlighted library, select **Show tables** or go to tab **Tables**. If you highlight a table name you can choose among the following options in the list box (see Figure 5.16 on page 73). **Select alteration type**:

- **Edit table title**
- **Delete tables**
- **Copy table to other libraries**
- **Edit header/footer**
- **Change update type**
- **Edit PDF layout**

Select **Show table** (or double click on a table) to open a highlighted table. You can insert headers and footers in tables by clicking on the corresponding button.

To get an insight into the management data of a table, highlight a table and hit button **Structural info**. The window **Structural table data** pops up (see Figure 5.17 on page 74).

Here you find information about

- the registration number
- the date of creation
- descriptions for the table and the library
- the data source and the update type
- the header/footer

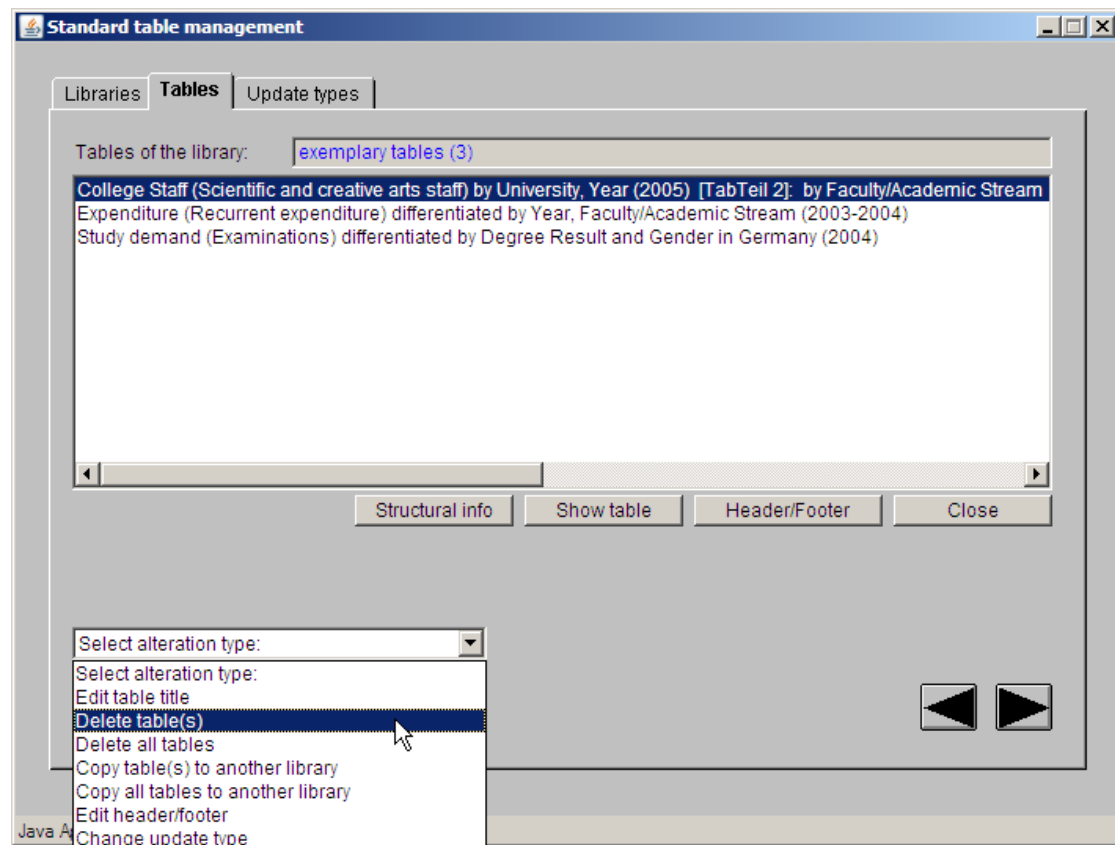


Figure 5.16: Window of the standard table management: Selection of a table for the alteration type **Delete table(s)**

Figure 5.17: Window for displaying and editing structural table data

And you can edit the following specifications:

- area description
- user authorisations
- update type
- header/footer

5.4 Editing the PDF layout of standard tables

The *standard table management* provides options to edit the PDF layout of *standard tables*. Go to tab **Tables**, highlight a table name, and select **PDF layout** in the list

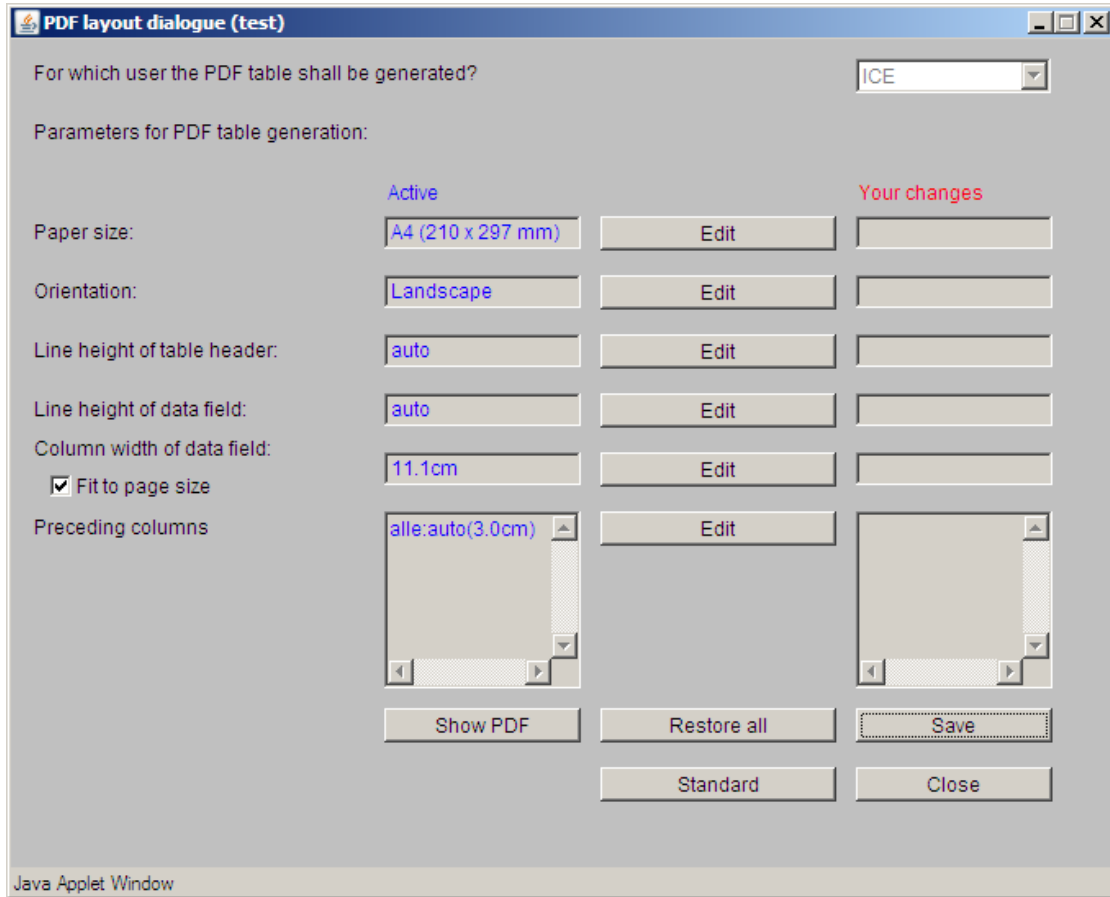


Figure 5.18: **PDF layout dialogue** with automatically generated standard formats

box. The window **PDF layout dialogue** pops up (see Figure 5.18 on page 75). You do not have to select a user in the list box at the upper right. For the PDF layout exists a standard format that is linked to user **ICE** which is the default. (As an exception there are two standard formats for the ICEbmbf: **ICE** and **GUS**.)

The program automatically calculates the fitting PDF configurations for the selected table and user. These configurations get displayed in blue colour in the column **Active**.

Click on button **Show PDF** to open the PDF table (see Figure 5.19 on page 76).

If required you can configure the following settings by pushing the corresponding buttons:

- **Paper size**
- **Orientation**
- **Line height of the table header and of the data field**
- **Column width of the data field and the preceding columns**

	Year	
	2004	2005
	Enroled students	
University	Number	
Total	62.407	63.355
Colombo	8.784	9.686
Peradeniya	9.903	10.523
Sri Jayawardenepura	9.376	8.699
Kelaniya	8.110	7.925
Jaffna	4.640	4.452

Figure 5.19: Example of an table in PDF format

All modifications you have done get displayed in red colour in the column **Your changes** (see Figure 5.20 on page 77). But you always can undo your configurations, either separately (button **double arrow**) or all at once (button **Restore all**). To reestablish the automatically generated default settings, click on **Standard**.

After saving the configurations, click on **Show PDF** to load the the newly designed page.

5.5 Quick information search with standard tables

The *standard tables* provided by ICE are ready-made tables that are easily accessible. The ICE system provides *standard tables* with cross-sectional data as well as time series data. You can access *standard tables* in the following formats: HTML, XLS (for spreadsheets like MS Excel and OpenOffice Calc), and PDF.

Since *standard tables* simply represent a selection of all provided data in the ICE-database, they only can satisfy a limited demand of information. If you have an exceeding need for information, you gain access to the collective data with the *flexible table generation*. The *flexible table generation* allows user defined combinations of nearly any data of the database (for more information see the TabGen-chapters). However, data access via ready-made *standard tables* goes much faster and more directly. So before you start generating tables by yourself, check up whether your wanted set of data is available in the library of standard tables.

For finding specific data, ICE provides two search techniques: the **Search by topic area**, and the **Search by keywords**.

5.5.1 Standard table search by topic area

On the ICE start page, click on **Catalogue** to open an overview of all available libraries. Here you find a set of ready-made *standard tables* by the ICE group and individually compiled libraries by other users (see Figure 5.21 on page 77).

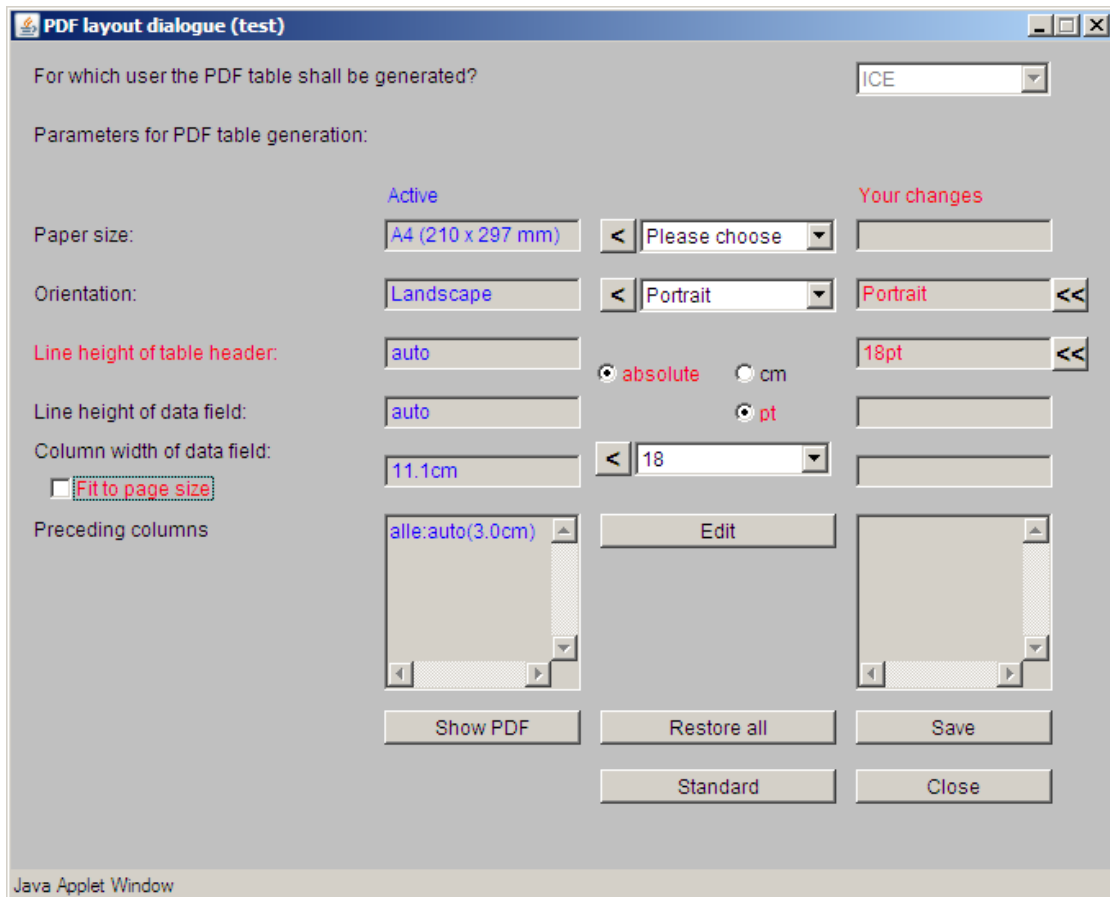


Figure 5.20: **PDF layout dialogue** with individual PDF settings

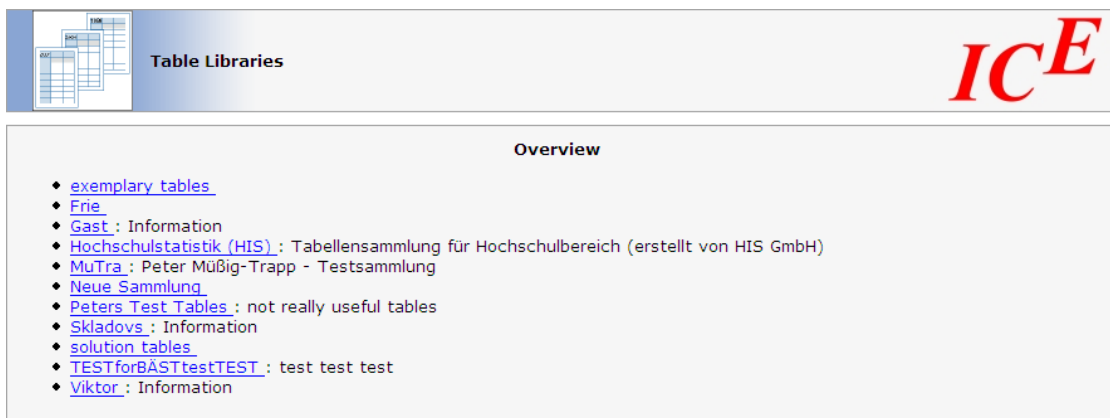


Figure 5.21: Overview on available libraries



Figure 5.22: Directory of the topic areas of a standard table library

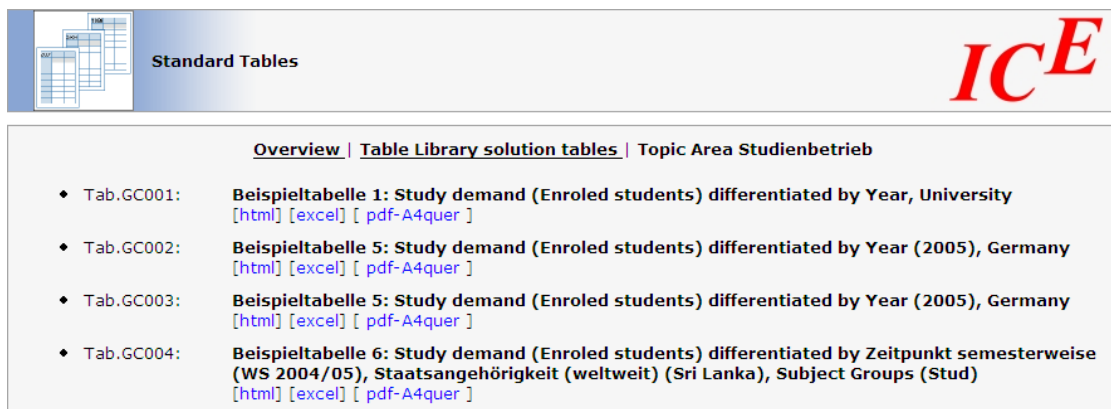


Figure 5.23: Overview on the topic area of a library

From this directory you have access to another overview that is structured by topics (see Figure 5.22 on page 78).

By choosing a topic you finally get a list showing the *standard tables* (see Figure 5.23 on page 78).

You can call up the tables in various formats: HTML, PDF, and XLS. Click on a table format to open the correspondent table.

5.5.2 Standard table search by keywords

The second way to find specific *standard tables* is to *search by keywords*. Go to ICE start page, and click on **Search**. A new window opens that contains two boxes. In the left box is a list of all **Available keywords**. The right box is for **Selected keywords** (see Figure 5.24 on page 79).

Enter a desired keyword into the input box left to **ok**. Then click on **ok** to jump to the corresponding location in the list. You can add a keyword to the list of **Selected keywords** by marking it in the left box, and then click on the **rightwards arrow** (or by double clicking on a keyword in the left box). You are free to add several keywords one by one to the right box. (see Figure 5.25 on page 80).

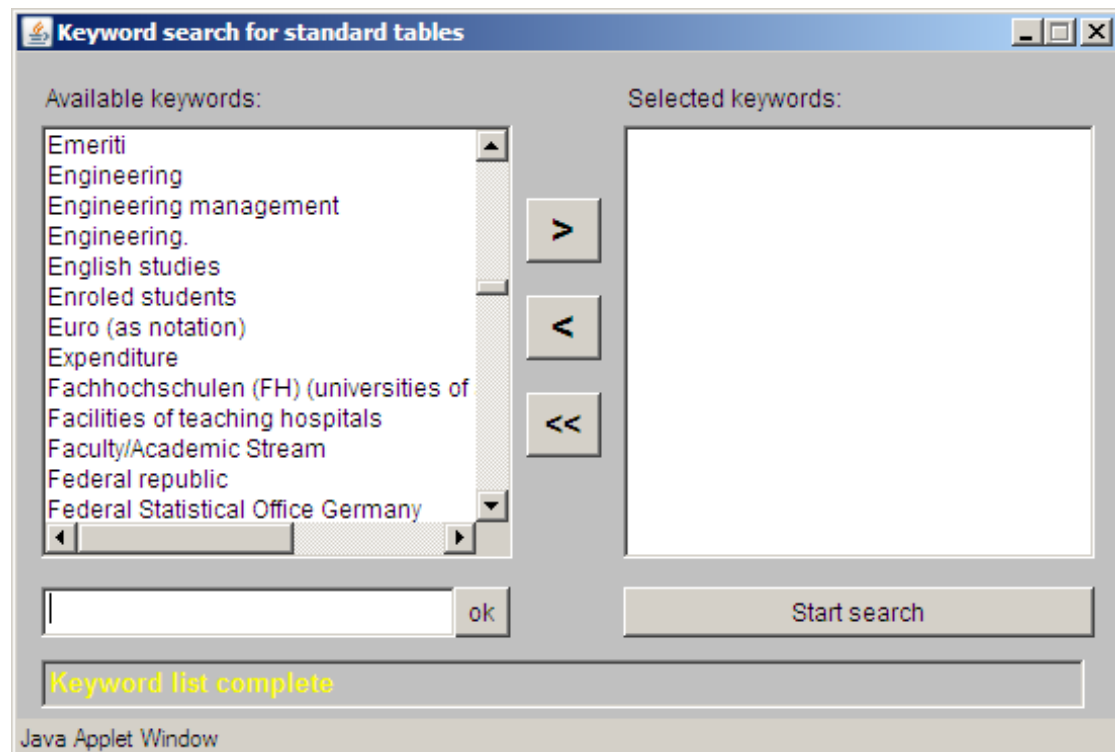


Figure 5.24: At first you see a list of all available keywords in alphabetical order

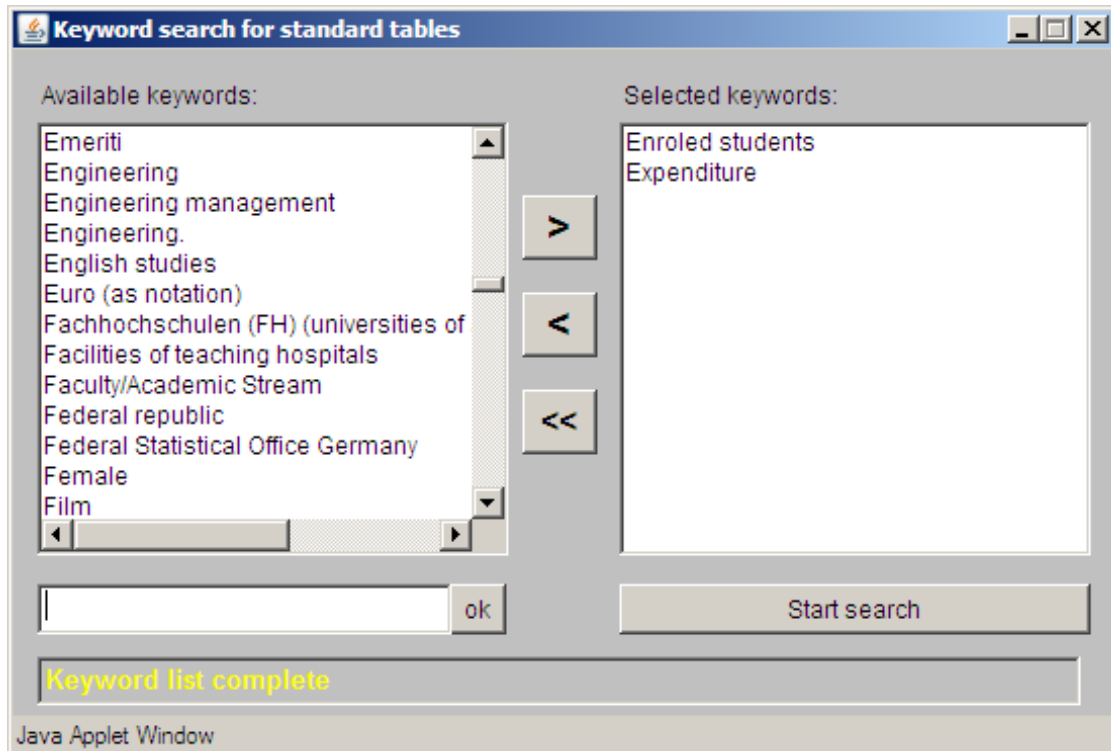


Figure 5.25: The keywords “Enroled students” and “Expenditure” have been selected

To remove a keyword from the list of **Selected keywords**, highlight one and click on the **leftwards arrow**, or click on the button with the **paired leftwards arrow** to remove them all.

If you select several keywords, the *keyword search* will produce a directory with *standard tables* that each fit to all selected keywords.



The more you pinpoint the desired *standard table* by including many *keywords*, the more suitable will be the matches of *standard tables* that the search result provides.

After you have finished the *keyword selection*, click on **Start search** to get a list of the suiting *standard tables* (see Figure 5.26 on page 81).

To open one of the listed *standard tables*, click on a related table format. The table gets displayed in a new window.



If the results of the search do not fit your expectations, go back to the window **Keyword search for standard tables** and start anew.

Keyword Search Results	
Selected keywords and number of tables	
<ul style="list-style-type: none"> 78 : Enroled students 5 : Expenditure 	
Result	
<ul style="list-style-type: none"> Tab.BZ003: 	Manual_TabGenII.example_2 College Staff (Scientific and creative arts staff) by University, Year (2005) [TabTeil 2]: by Faculty/Academic Stream [TabTeil 3]: Study demand (Enroled students) by University, Year (2005) [TabTeil 4]: Expenditur [html] [excel] [pdf]
<ul style="list-style-type: none"> Tab.FZ001: 	College Staff (Scientific and creative arts staff) by University, Year (2005) [TabTeil 2]: by Faculty/Academic Stream [TabTeil 3]: Study demand (Enroled students) by University, Year (2005) [TabTeil 4]: Expenditure (Recurrent expenditure) by [html] [excel] [pdf]
2 Entries found!	

Figure 5.26: Overview of standard tables for the combination of the keywords “Enroled students” and “Expenditure”

5.6 Password change; grant read and write permission

The users- and authorisations-system of ICE allows you to protect your *standard tables* and libraries from other user’s access. ICE has a group based authorisations-system: The users can define variable authorisations for themselves, the own group, and all other users of the system by means of granting read and write permission and no access.

5.6.1 Password change

On the ICE start page, click on **Users and groups**, to open the **Users and groups management** (see Figure 5.27 on page 82). On this window you can easily change your password. Just enter your **Old password** and a **New password** plus verification into the correspondent boxes and select **Change**.

5.6.2 Authorisations- and group management

Furthermore users in favour of the required rights can create new users and groups, and manage existent authorisations, in the tab **Users and groups management** (see Figure 5.28 on page 83).

This tool provides the following options: You can register new **Users**, and you can register and edit **Groups** and **Roles**. A *group* consists of a number of users who are related to certain roles. Every *user* must be linked to a *group* and to a *role* that is linked to a collection of authorisations. *User* connections to *groups* and *roles* can be accessed and altered.

The screenshot shows a Java applet window titled "Users and groups management". Inside the window, there are two tabs: "Change password" (which is selected) and "Users and groups management". The "Change password" tab contains the following elements:

- User name:** A text field containing the username "frieese" in red text. To the right of the text field is a yellow warning triangle icon.
- Old password:** An empty text input field.
- New password:** An empty text input field.
- Password verification:** An empty text input field.
- Buttons:** At the bottom of the tab, there are two buttons: "Change" and "Close".

At the bottom of the window, there is a status bar that reads "Java Applet Window".

Figure 5.27: Password change and management of read and write authorisations

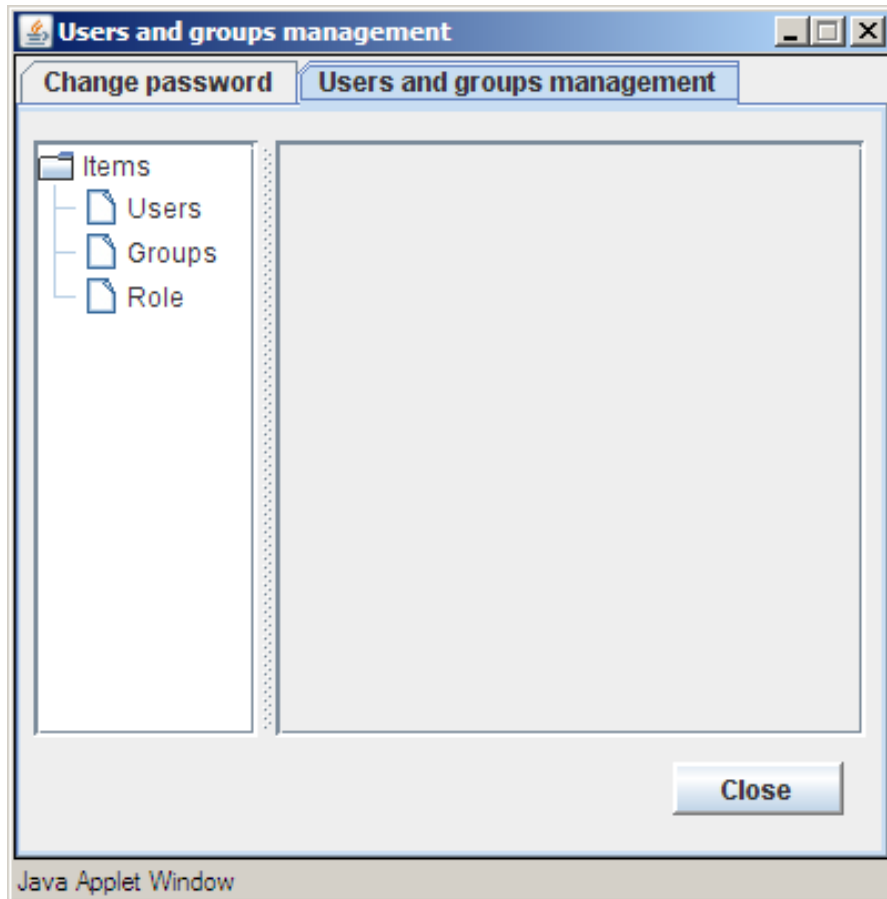


Figure 5.28: "Users and groups management"

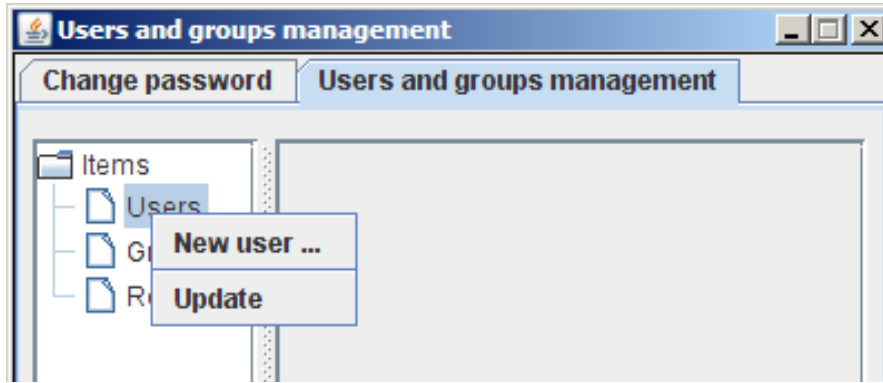


Figure 5.29: Pop-up menu for the registration of new users

5.6.3 Installing new users, groups, and roles

Right click on the tree node **Users** to open the pop-up menu as seen in Figure 5.29 on page 84. Select **New user...** to start the dialogue for the registration of new users.

The tree nodes **Groups** and **Roles** bear options analogue to this (right clicks lead to pop-up menus).

5.6.4 Managing users, groups, and roles

With left clicks on these nodes (5.6.3) you open lists with existing *users*, *groups*, and *roles*. Right clicks on names of these lists lead to further pop-up menus with dialogue fields (see Figure 5.30 on page 85).

The pop-up menu for users provides options to **Change passwords**, to **Delete** and **Rename** users, and to change other user entries (**Properties** – see Figure 5.31 on page 86).

Go to tab **Membership** to access and alter *group* memberships of *users*.

In a similar way you can manage *user* memberships of *groups*: left click on the tree node **Groups**, then right click on the desired *group* to open the pop-up menu. There select **Add member**, and in the following dialogue field, **Properties of**, you can access the existing members of this *group*. You have the options to **Add...** and to **Remove group** members (see Figure 5.32 on page 87).

Furthermore the pop-up menu provides the option to **Rename groups**.

And likewise you can change the descriptions of *roles*. On the tree node highlight **Roles** by left click, then select a *role* from the list with right click to open the pop-up menu and click on **Show/edit specification**. In the following dialogue you can access and edit the desired entries (see Figure 5.33 on page 88).

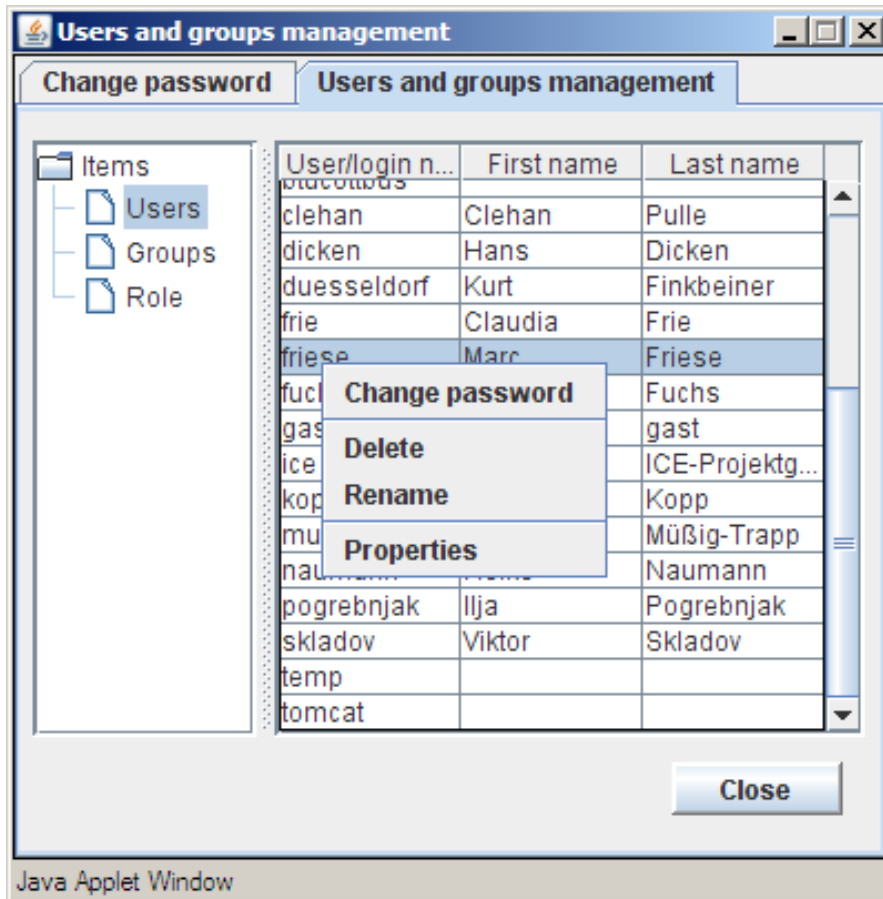


Figure 5.30: List of existing users with pop-up menu for editing the user entries

Properties of friese

General | **Membership**

User: friese

Form of address:

Titel:

First name:

Last name:

E-mail:

Super user: ☐ Yes ☒ No

Role:

Java Applet Window

Figure 5.31: Dialogue field “Properties” for editing of user entries

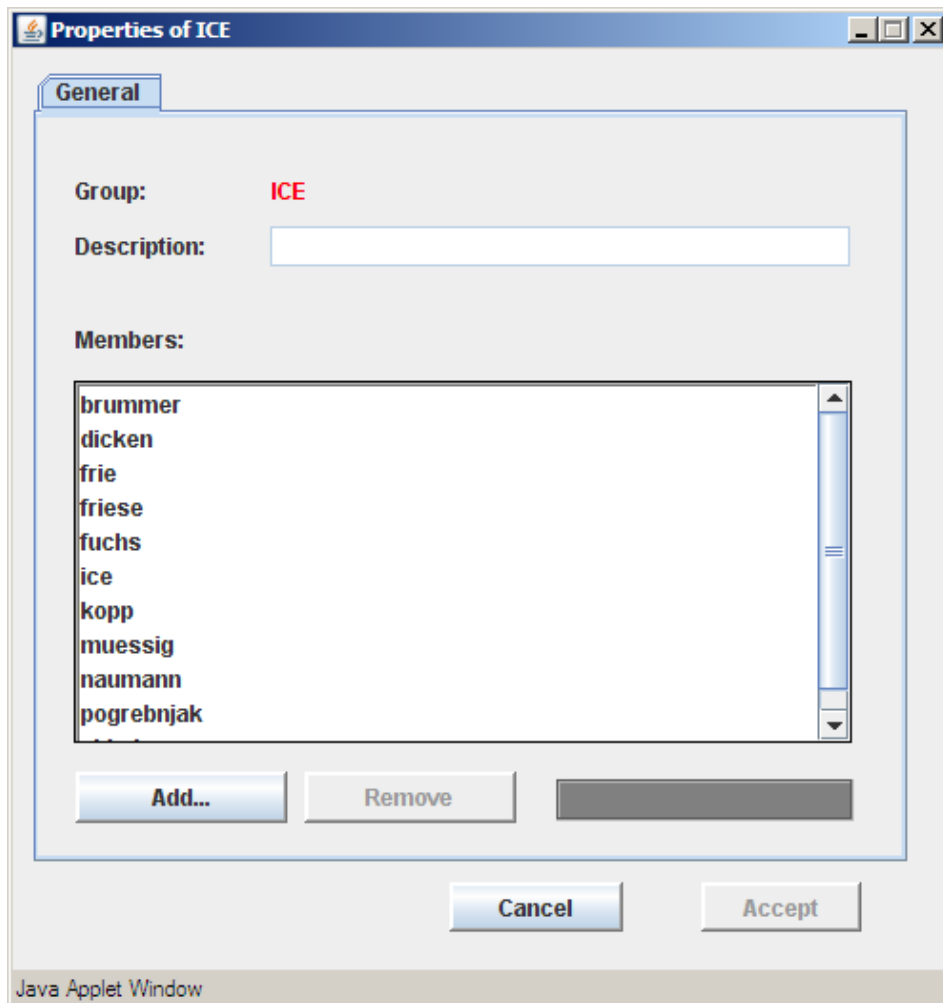


Figure 5.32: Dialogue field for editing user belongings to groups

Role info (show and edit) [X]

Role: iceuser

Description: Standardtabellenrecherche

Close Submit

Java Applet Window

Figure 5.33: Edit role information

6 ICE-key

The *key system* of ICE is mainly based on the keys used by the Federal Statistical Office of Germany (STBA). All changes made by the STBA get included in the ICE-key. In addition ICE provides special keys, e.g. for mapping specific aggregations and for meeting the particular requirements of users and data stocks.

A data can be clearly defined by a key. For this purpose key properties are used. They describe certain *characteristics* of a data stock (e.g. gender, nationality etc.). *Characteristics* are available as *attributes*: The characteristic *gender* may have the attribute *male*, *female*, or *unknown*. The characteristic *nationality* may have the attribute *German*, *foreign* etc. Every *characteristic* is linked to a number (code), and every *characteristic* has a set of assigned *attributes* that again are numbered. Inside of a data stock every data can be clearly defined by a key.

6.1 Keylist generation

To get a general idea of the used keys you can generate a keylist in PDF or RTF format. At the ICE start page you can find the item **Keylists**. Click on one of the two provided formats (**pdf** or **rtf**) to generate a keylist directly from the database that always contains the corresponding and current version of the complete ICE-key.

6.2 Access to ICE-key during TabGen I & II

When using TabGen I or II, at the top right of the **Table generation** window you find the tab **ICE-Key**. This menu item provides access to the up-to-date ICE-key anytime during *table generation*. This might be useful when you are wondering what *attributes* might be available for a certain *characteristic*, or if you want to clarify the meaning of a *characteristic*.

You can access the ICE-keys anytime during table generation. You can return to the point where you left the table generation by clicking on the corresponding tab (e.g. **Table Definition**) (see Figure 6.1 on page 90).

The tab **ICE-Key** contains two big boxes on the left and on the right and one little box at the top right.

In the left box is a list with all *characteristics* of the *ICE-keys* and the corresponding codes. Select a *characteristic* either by double click or highlight it and click on the button with the **rightwards arrow**. Now the code and the name of the chosen *characteristic* appears in the small box at the top right. In the bigger box beneath you see a list of this *characteristic's attributes* with the corresponding codes.

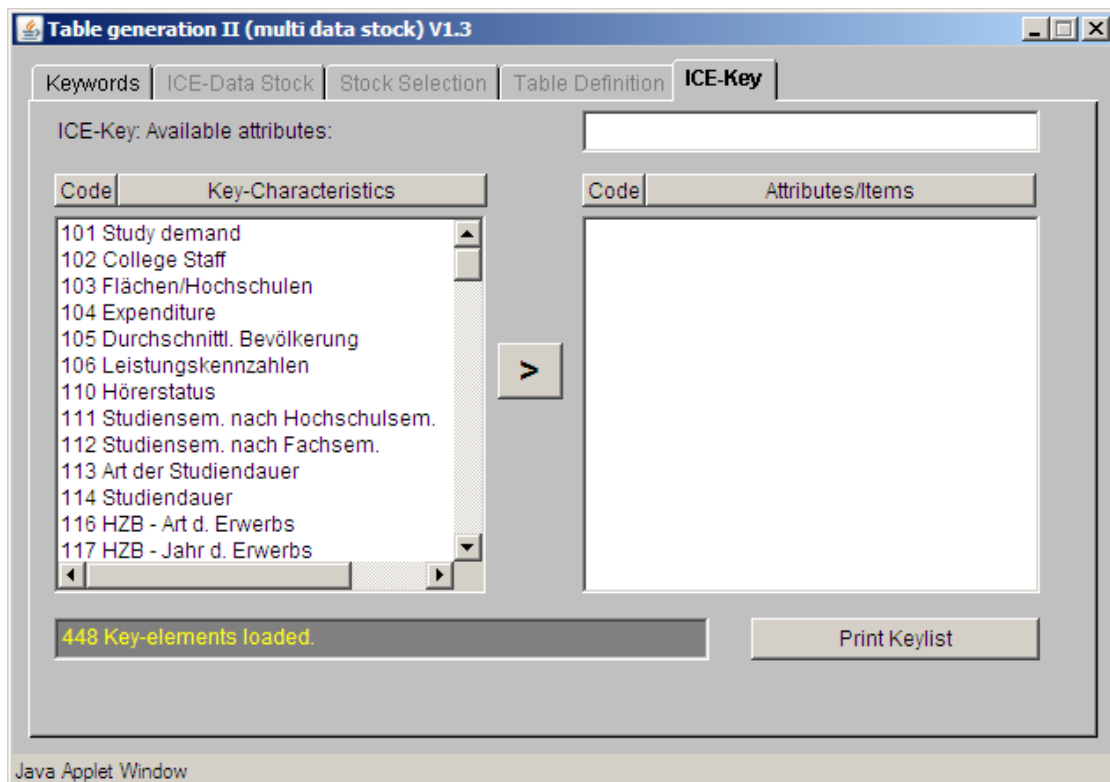


Figure 6.1: Access to the “ICE-Key” at “Table generation”

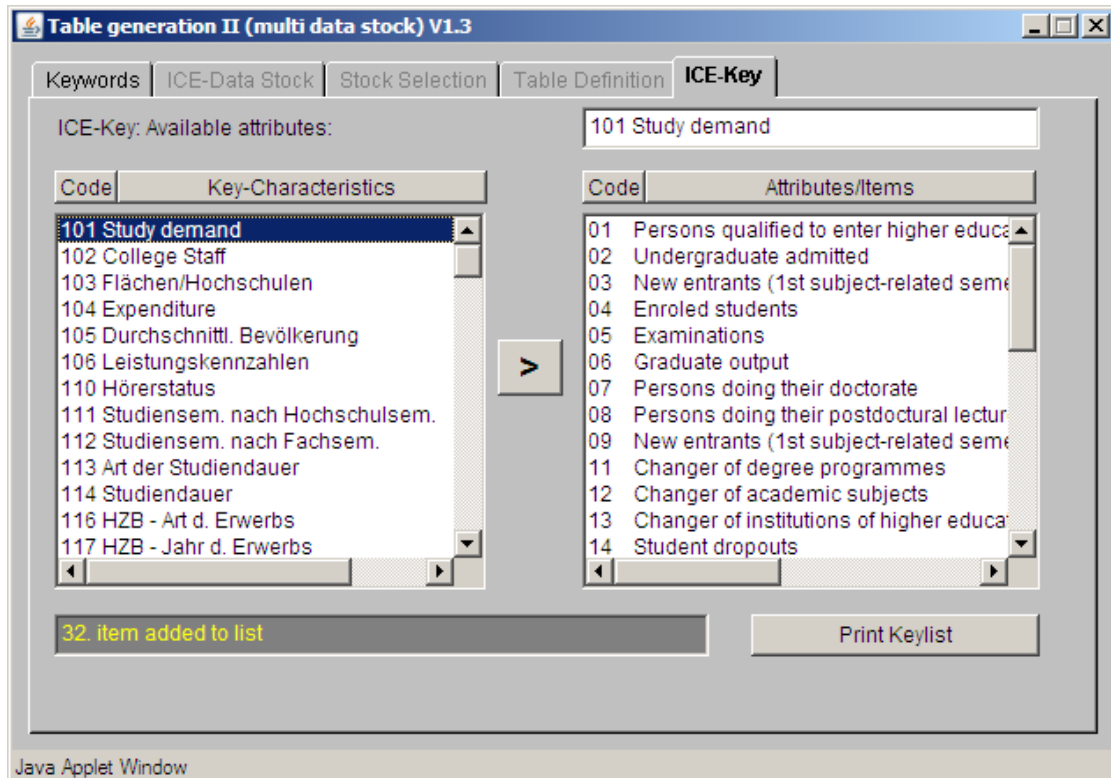


Figure 6.2: All attributes of a characteristic get displayed

For the following figure we have selected the *characteristic* study demand. At first the listed items are ordered ascending by **Code** numbers. With the buttons **Key-Characteristics** and **Attributes/Items** you can sort them alphabetically. If you want to renew to ascending **Code** numbers, click on **Code** (see Figure 6.2 on page 91).



You can create a PDF document with the complete keylist of the current database you are working with by a click on **Print Keylist**.

6.3 Definitions of ICE-keys

For further information on the keys, you can call up the *key definitions*. At *TabGen I & II* you can access this function on the tabs **Keyword** and **ICE-Key**. There right click a *keyword* and select **definitions**. When available, this will open a new window with some annotations to the *keyword*.

7 ICEcalc – calculations and edit functions

For tables that contain sample sizes or financial amounts (e.g. Euro), oftentimes there is a need to lay open structural relations among absolute numbers by the calculation of measured values. For this reason ICE provides some functions for additional calculations of data that has been extracted out of the database. The following functions are available:

Percentage calculations (base value = 100)

Indexing (fixable base value)

Difference calculations (absolute value or percentage value)

Quota calculations (fixable base value)

The tool for running these calculations is the **ICEcalc**.

7.1 Spreadsheet

ICEcalc is a programme module that provides graphical displays for generated tables. In addition it offers a number of calculation features for ICE-tables.

7.1.1 Layout of ICEcalc

At *TabGen I & II* all ICE-table get displayed within the ICEcalc. According to the table size, the generating and displaying process can take some time.

The window of ICEcalc is structured horizontally in four parts (see Figure 7.1 on page 93). In the figure these parts are marked by colours:

Blue Operational field with menu- and toolbar

Yellow Field for the table title

Red Table field showing the generated table

Green Field for data sources and table annotations

You can scale the fields up and down with slide bars between them (fields can be hidden completely).

You can place the toolbar as a little window of its own at any point on your screen. When you close the toolbar window, it automatically reappears at its default position.

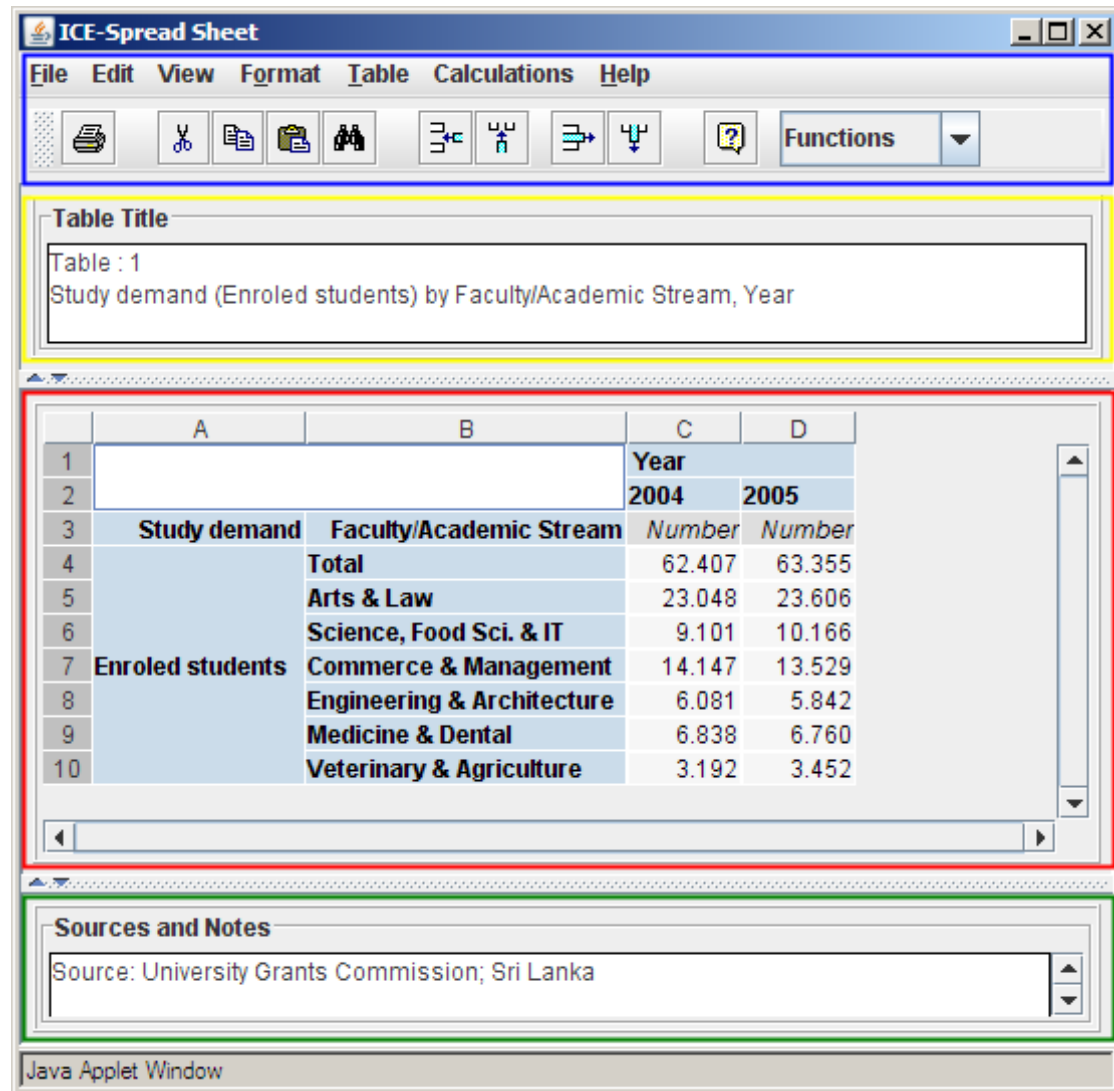


Figure 7.1: Layout of ICEcalc

7.1.2 Edit cells

Select a cell by clicking on it. With a double click you can edit cells. All cells are editable except for data cells. Data cells are blocked.

To select a table range consisting of several cells, click on a cell – do not release the mouse button – and move the cursor over the area that you want to select.

ICE-spreadsheet allows user defined formulas, like:

- =1+54
- B10^(5-2)
- =AVERAGE(C1:C10)
- =SUM(C2:C7)/2

Every formula must begin with '='. A formula may contain parameters, operator symbols, and functions.

Parameters:

- Literals: -1, 0, 100
- Relative cell references: A1, B4, E76
- Absolute cell references: \$A\$2, \$B\$5, \$E\$7
- Cell ranges: C1:C10, A2:B2

ICE-spreadsheet provides the following operators:

- Multiplication (*)
- Addition (+)
- Subtraction (-)
- Division (/)
- Integer division (%)
- Exponent (^)

Functions are predefined formulas that calculate results from certain ordered parameters (see above). The structure of the functions is standardised: Firstly stands the name of the function, followed – in round brackets – by the parameter values that are divided by commas (=FUNCTIONNAME(PARAMETER1,PARAMETER2, ...)). This application provides a great number of functions that get individually discussed below:

- **ABS** provides integer ratios of parameter values.
usage: =ABS(parameter)
example: =ABS(-1) returns 1.
- **AVERAGE** provides mathematical averages of parameters.
usage: =AVERAGE(parameter1,parameter2,...)
example: =AVERAGE(1,2,3) returns 2.
- **COUNT** provides the number of parameters
usage: =COUNT(parameter1,parameter2,...)
example: =COUNT(A1:A25,B1) returns 26.
- **E** provides the approximated value of e. Needs no parameter value.
usage: =E()
example: =E() returns 2.7182817.
- **INT** delivers the integer ratio of the parameter.
usage: =INT(parameter)
example: =INT(94.99) returns 94 and =INT(-84.54) results in -84.
- **LOG** provides the logarithm to base e.
usage: =LOG(parameter)
example: =LOG(E()*E()) returns in 2.0.
- **MAX** provides the greatest parameter.
usage: =MAX(parameter1,parameter2,...)
example: MAX(99.99,100,99.9999) returns in 100.
- **MEANDEV** provides the greatest average absolute deviation of parameter values
usage: =MEANDEV(parameter1,parameter2...)
- **MEDIAN** provides the average of parameter values.
usage: =MEDIAN(parameter1,parameter2...)
- **MIN** provides the least parameter value.
usage: =MIN(parameter1,parameter2,...)
- **PI** provides the approximated value of pi.
usage: =PI().
- **RANGE** provides differences of the least and the greatest parameter values.
usage: =Range(parameter1,parameter2,...).
- **Round** provides rounded down values of parameters as integers.
usage: =Round(parameter).
- **SQRT** provides square roots of arguments.
usage: =SQRT(argument).

- **SUM** provides sums of all parameter values.
usage: =SUM(argument1,argument2,...).
- **STDDEV** provides standard deviations of arguments.
usage: =STDDEV(argument1,argument2,...).
- **TRIG** can be one of the following trigonometric functions: SIN, COS, TAN, ASIN, ACOS, or ATAN. The functions only have one single parameter value in radians.
usage: =TRIG(argument)
example: =COS(2*PI()) returns 1.0.

7.1.3 Menu bar

The handling of ICEcalc goes via tool bar, menu bar, and hot keys. In this section we list individual menu items along with related hot keys. Definitions of these functions will follow in the next sections.

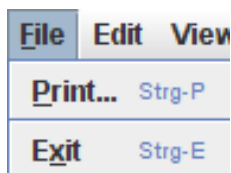


Figure 7.2: File menu

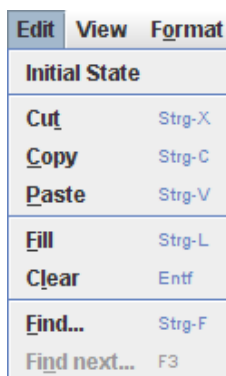


Figure 7.3: Edit menu

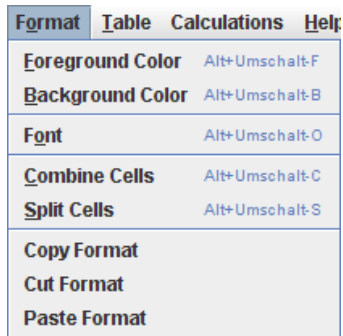


Figure 7.4: **Format** menu

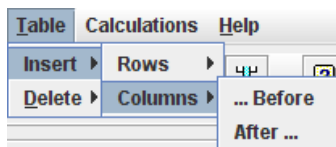


Figure 7.5: **Table** menu - insert

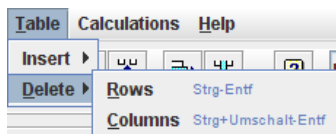


Figure 7.6: **Table** menu - delete

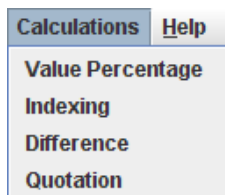


Figure 7.7: **Calculations** menu

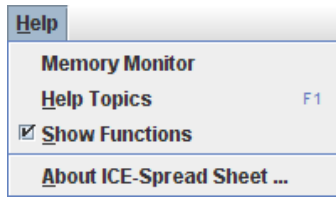










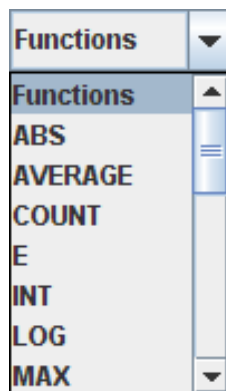


Figure 7.8: **Help** menu

7.1.4 Tool bar

On the tool bar are several symbols that you can use to call up some functions of ICEcalc.

- Print 
- Cut 
- Copy 
- Paste 
- Find 
- Insert row(s) 
- Insert column(s) 
- Delete row(s) 
- Delete column(s) 
- Help 



- Functions

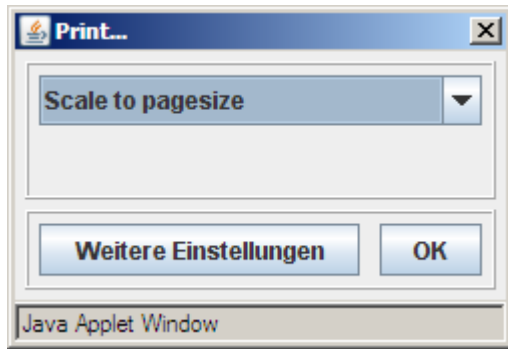


Figure 7.9: Print dialogue I

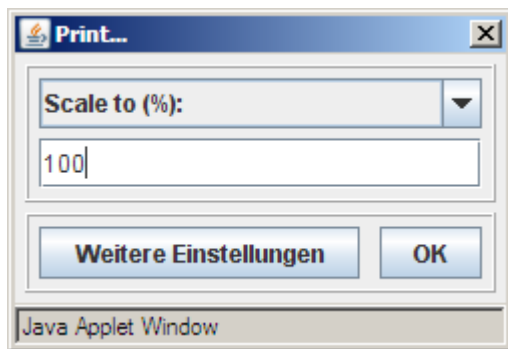


Figure 7.10: Print dialogue II

7.1.5 Features of ICEcalc

You can call up individual features of ICEcalc with the tool bar, menu bar, and hot keys.

7.1.5.1 Print

ICEcalc is a so called applet, and so, due to safety reasons, it only has limited access to local system resources. For this reason, before printing, a user verification is required. So when the system asks whether you want to grant the applet access to the printer, select **OK**.

After releasing the printer, the print dialogue of ICE-spreadsheet gets opened in a new window (see Figure 7.9 on page 99). In the pull-down menu you have two options:

Scale to pagesize: The complete ICE-table will be scaled to the size of the page (see Figure 7.9 on page 99).

Scale to (%): Use this option to enter a scale level in percentages (see Figure 7.10 on page 99).

In case that the dimension of an ICE-table exceeds the pagesize in height or in width, due to the calculated or entered scale level, the table will be printed on multiple pages.

Clicking on **More settings (Weitere Einstellungen)** opens a dialogue window that is depending on your system. When you leave that window you return to Figure 7.9 on page 99 or Figure 7.10 on page 99. Select **OK** (to go to your system's print dialogue. There you can start the printing process.

7.1.5.2 Restore initial state

This function undoes all executed changes to the table and restores the table to its initial state.

7.1.5.3 Clipboard functionalities (cut, copy, & paste)

The clipboard functions of ICEcalc allow to cut, copy, and paste contents of selected cell ranges.

These functions are compatible with Excel, so data exchange between ICE-tables and Excel tables is possible without difficulty.

Due to safety reasons, Java applets, like ICE-table generation, only have limited access to your system resources, so the clipboard functions do not run at your system unless specifically authorised. If you want to do so, please follow those instructions:

- Open the installation directory of your Java plugin (JRE - Java Runtime Environment) (that we call <JAVA_HOME> in the following).
- The security settings of Java plugins are getting saved in the configuration file "java.policy". You can find this file in the directory <JAVA_HOME>/lib/security.
- To grant applets the permission to use the clipboard, add the following lines to your "java.policy" file:
grant {
 permission java.awt.AWTPermission "accessClipboard";
};
- Then save your changes.
- If you cannot save the changes or some other problems occur, contact your system administrator.

Remark: This modification allows any applet to access the clipboard!

7.1.5.4 Fill

Calling up this function opens the dialogue box **Fill** (see Figure 7.11 on page 101).

7.1.5.5 Delete

Use this function to delete values of cell ranges.

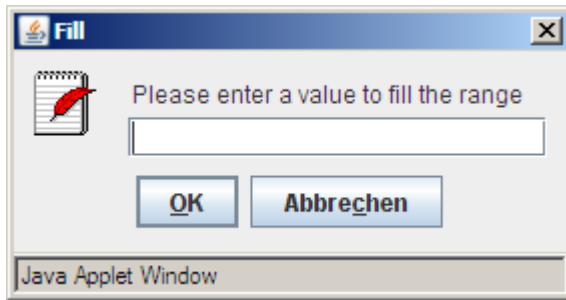


Figure 7.11: Dialogue box “Fill”

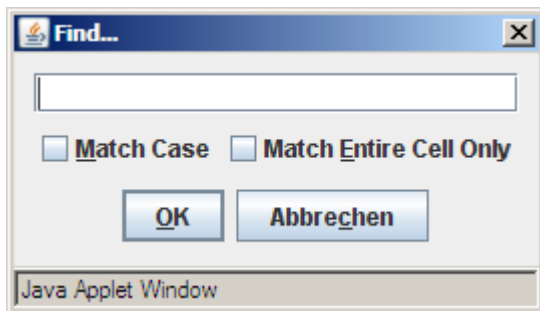


Figure 7.12: Search dialogue

7.1.5.6 Find and Find more

These functions open the search dialogue (see Figure 7.12 on page 101).

Enter the wanted term into the text box. You have two search options: To account for case sensitivity check the left box **Match Case**. Check the right box **Match Entire Cell Only** to only get results if the wanted term matches the complete content of a table cell.

At the search process: when you highlight cell A1 or no cell at all, the search is executed on the entire table. When you highlight any other cell, the search is limited to the cells lying behind this starting cell (meaning cells to the right in the same row and all cells in rows below). If your search results in matches, the first corresponding cell gets highlighted. If there are no matches, you get a message (see Figure 7.13 on page 102).

Use **Find more** to search on for an already entered term.

7.1.5.7 Edit font- and background colour

Use this function to change the font- and background colours of a selected cell range. Calling one of this functions (**Foreground Color** (=font colour) or **Background Color**) opens the colour dialogue (see Figure 7.14 on page 102).

Choose a colour and click on **OK** to execute the change on the selected cell range.

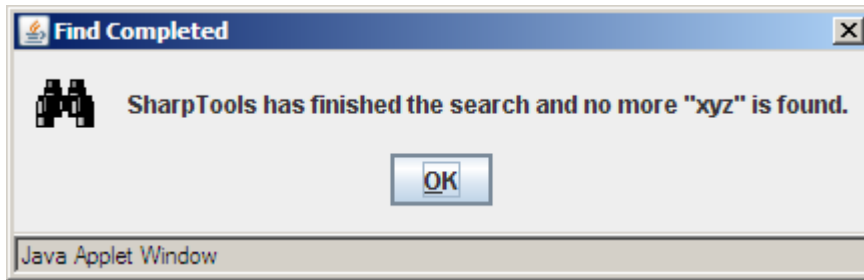


Figure 7.13: Report of the unsuccessful search for the term “xyz”

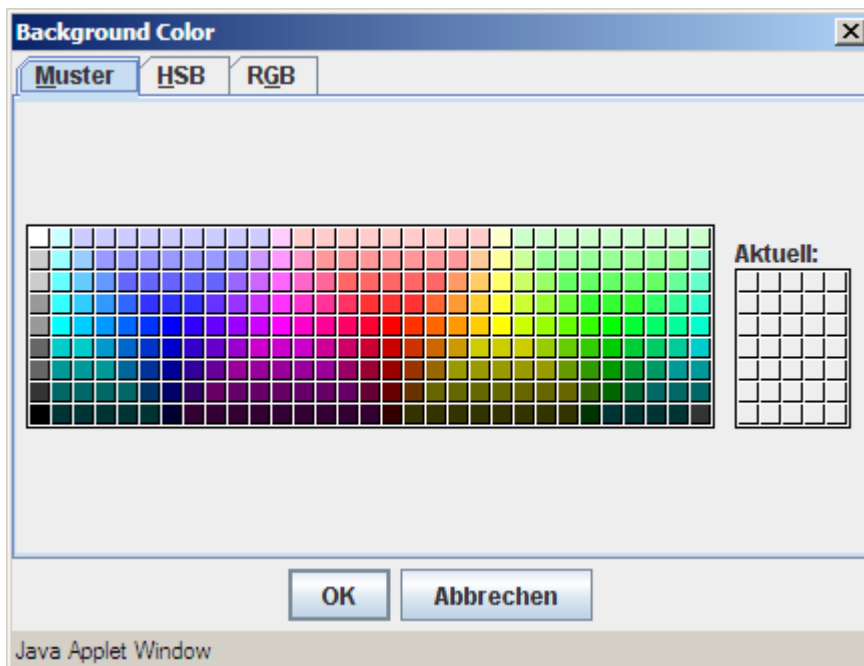


Figure 7.14: Edit “Background Color”

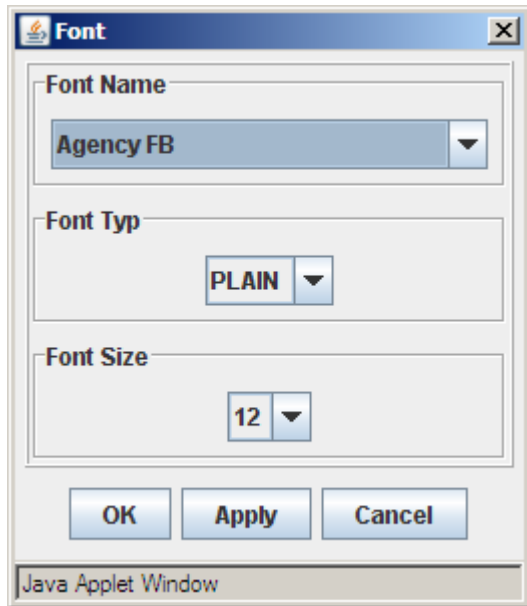


Figure 7.15: Edit font

7.1.5.8 Edit font

For a selected cell range you can change font options. **Font** opens the font window (see Figure 7.15 on page 103).

You have the following options:

- Choose among all **typefaces** that are available on your system.
- Choose a font **design** (plain, bold, or italic).
- Choose a font **size** (from 10 to 20 pixel).

OK executes your settings and closes the window. **Apply** executes the settings while the window stays open.

You can alter the cell range without closing the **Font** window.

7.1.5.9 Combine/split cells

Select the cells that you want to combine/split, then call one of the functions. When combining, the first cell of the selected range (in the top left) spreads over the others.

On Figure 7.16 on page 104 cells A1 and A2 are combined. A1 is spread over A2.

Remark: Cells that already are combined cannot be combined any more times.

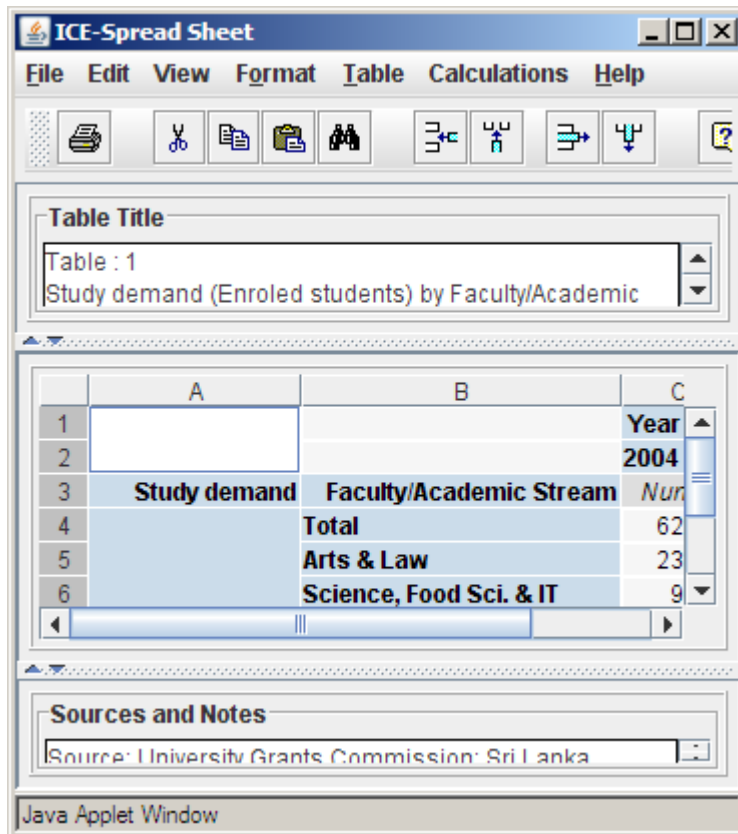


Figure 7.16: Combined cells – A1 is spread over A2

7.1.5.10 Cell format: cut, copy, and paste

Cell formats are defined by font type, font colour, and background colour. You can cut out or copy a cell format of a certain cell range and transfer (paste) it to another. If you cut out cell formats, the corresponding cell range will recover default formats settings.

This function depends on the clipboard feature. If you want to use it, make sure that your system supports this feature for Java applets (7.1.5.3).

7.1.5.11 Add rows and columns

You can add any number of further rows and columns to an ICE-table. Choose the option **... Before** to add rows/columns before a selected cell range and **After ...** to add them behind. The number of new inserted rows/columns equals the number of those that have been highlighted.

7.1.5.12 Delete rows/columns

Use this function to delete all selected rows and columns.

Remark: All rows/columns containing data cells cannot be deleted and not be edited (7.1.2).

7.1.6 Running calculations

ICEcalc provides some functions for additional data calculations . The following functions are available:

- Calculations within a single table unit (meaning *base-* and *destination-attributes* are located in the same *table unit*; see 3.2.1).
 - *Percentage calculations* (base value = 100)
 - *Indexing* (fixable base value)
 - *Difference calculations* (absolute value or percentage value)
- Calculations across several table units (meaning base- and destination-attributes are located in different table units).
 - *Quotation* (fixable base value)

These calculation functions feature a high level of automation.

It is possible to rebuild these automatic calculation functions by adding further columns, and by editing the correspondent table cells (see 7.1.2). But such manual calculations are very extensive.

Calculations follow the same procedure, regardless of which function has been chosen (see Figure 7.17 on page 106):

Remark: In the following text segment we use the terms *rows-* and *columns-attributes*. *Attributes* can be identified by the title of rows and columns.

Figure 7.17: Calculations window

1. Deciding on a calculation function:
 - in rows
 - in columns
2. Definition of a *base-attribute*: Depending on the function, a *rows-attribute* or a *columns-attribute* gets selected. The coordinates of the attribute get displayed in the text box to the right of **Base-Definition**.
3. The selection of a *base-attribute* unlocks the option for **Destination-Definition**. Now select *destination-attributes* the same way as you have selected a *base-attribute*. This time you can select several attributes. Click on **Automatically (for all attributes)** to select all attributes, and click on **New** for deleting the already selected ones (again displayed in a text box).
But the automation feature is not available for calculations across multiple table units. Depending on the type of function, the selection of destination-attributes may be limited:
 - Calculations within a single table unit: base and destination are located in the same table unit.
 - Calculations across table units: base and destination are located in different table units.
4. **Layout Definition:**

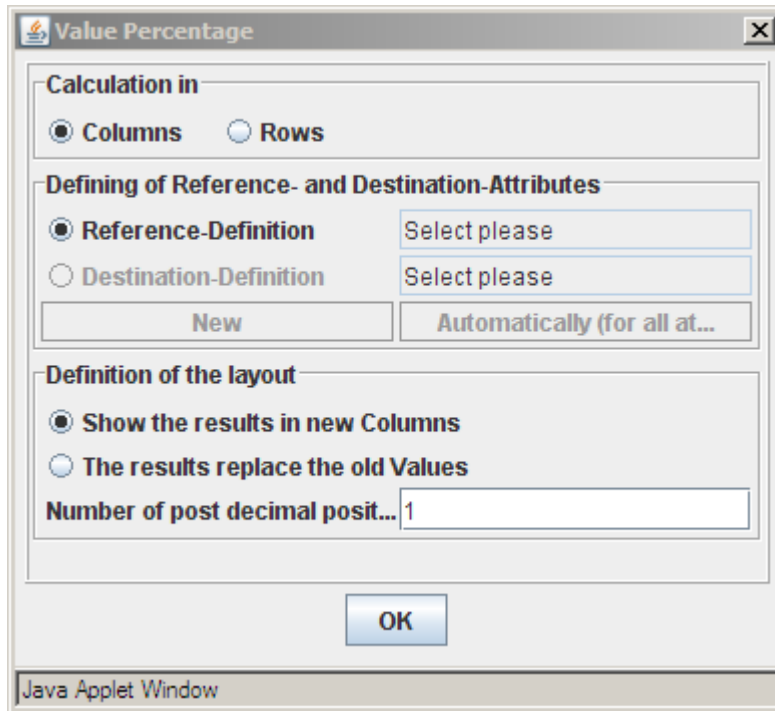


Figure 7.18: Percentage calculations

- You have two options of including the results in the table:
 1. **Show the results in new columns.**
 2. Let **The results replace the old values.**
- Enter the number of decimal places for the result values (up to ten decimals).

There are more settings that depend on the calculation functions. To learn more about them, read the descriptions of the individual functions.

After the following detailed presentation of the calculation functions, we will explain all steps of an indexing process exemplary.

7.1.6.1 Percentage calculations

The results of this calculation base on the following formula (see Figure 7.18 on page 107):

- $\text{destination_value} / \text{base_value} * 100$

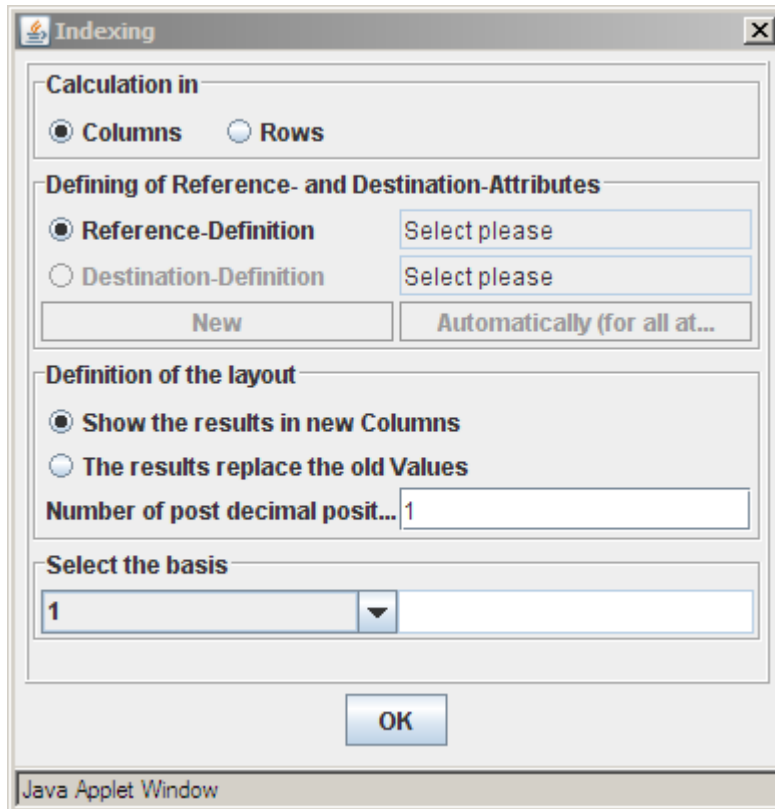


Figure 7.19: Indexing

7.1.6.2 Indexing

The results of this calculation base on the following formula (see Figure 7.19 on page 108):

- $\text{destination_value} / \text{base_value} * \text{basis}$

You can define the value of the basis (index). The default value is '1'.

7.1.6.3 Difference calculations

The results of this calculation base on the following formulas (see Figure 7.20 on page 109):

- for results in absolute values: $\text{destination_value} - \text{base_value}$
- for results in percentages: $100 - \text{destination_value} / \text{base_value} * 100$

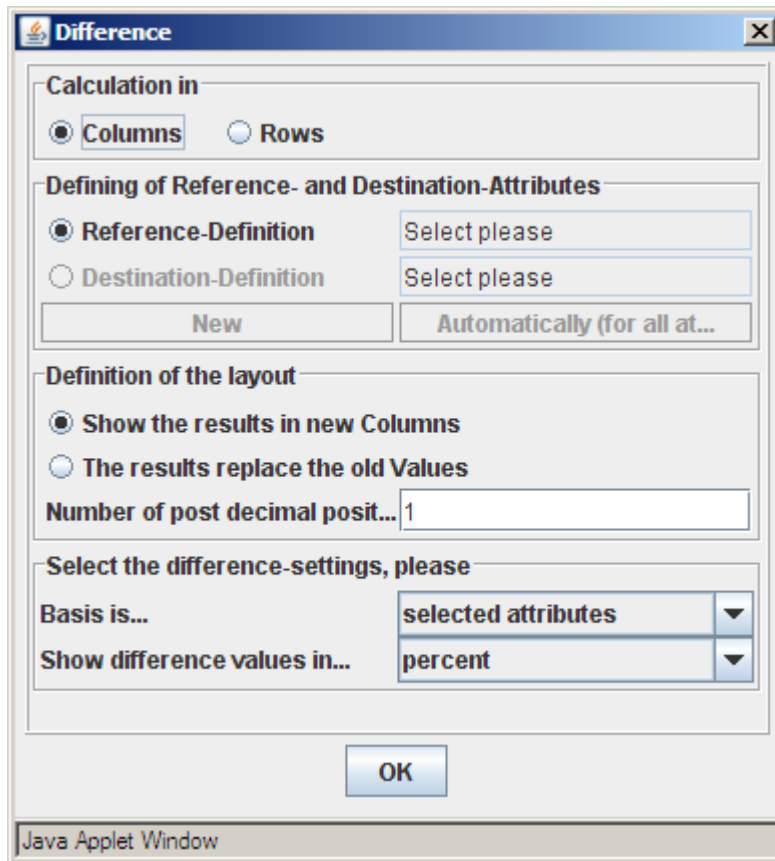


Figure 7.20: Difference calculations

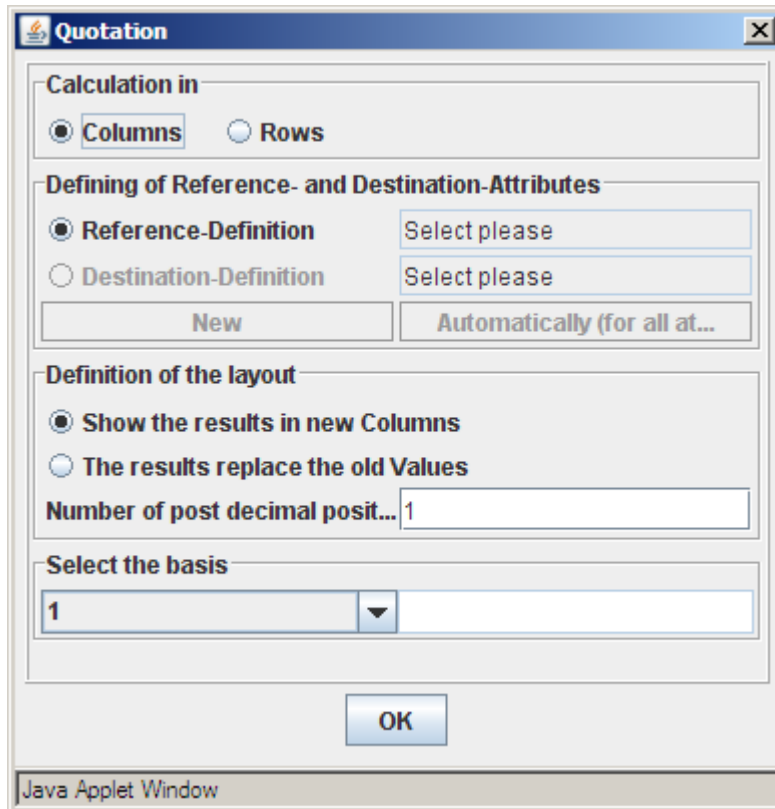


Figure 7.21: Quotation

7.1.6.4 Quotation

The results of this calculation base on the following formulas (see Figure 7.21 on page 110):

- $\text{destination_value} / \text{base_value} * \text{basis}$

You can define the value of the basis (index). The default value is '1'.

7.1.6.5 Example: Indexing

This section shows step by step how to run an *indexing*.

After generating a table titled “Table : 1 Study demand (new entrants (1st subject related semester),Enroled students) by Gender, Year, Nationality (dich.) (Germ. and foreign. total)” (see Figure 7.22 on page 111), we want to know the ratio of the female and the male *study demand* to the total study demand on a basis of '1'. The suiting function for this calculation is *indexing*.

In the menu bar, open the indexing window (**Calculations-Indexing**).

7 ICEcalc – calculations and edit functions

The screenshot shows the 'ICE-Spread Sheet' application window. It has a menu bar (File, Edit, View, Format, Table, Calculations, Help) and a toolbar with various icons. Below the toolbar is a 'Table Title' section containing the text: 'Table : 1', 'Study demand (New entrants (1st subject-related semester), Enroled students) by Gender, Year, Nationality (dich.) (Germ. and foreign. total)'. The main area displays a table with columns A through F. The table data is as follows:

	A	B	C	D	E	F
1			Nationality (dich.)			
2			Germ. and foreign. total			
3			2001	2002	2003	2004
4	Gender	Study demand	Number	Number	Number	Number
5	Total	New entrants (1st subject-related semest...	479.939	506.227	530.328	496.792
6		Enroled students	1.868.229	1.938.811	2.019.465	1.963.108
7	Male	New entrants (1st subject-related semest...	242.354	253.319	274.433	256.407
8		Enroled students	995.225	1.020.423	1.061.544	1.026.199
9	Female	New entrants (1st subject-related semest...	237.585	252.908	255.895	240.385
10		Enroled students	873.004	918.388	957.921	936.909

Below the table is a 'Sources and Notes' section with the text: 'Source: Federal Statistical Office Germany; Main reports'. The window title bar indicates it is a 'Java Applet Window'.

Figure 7.22: Initial state for an indexing process

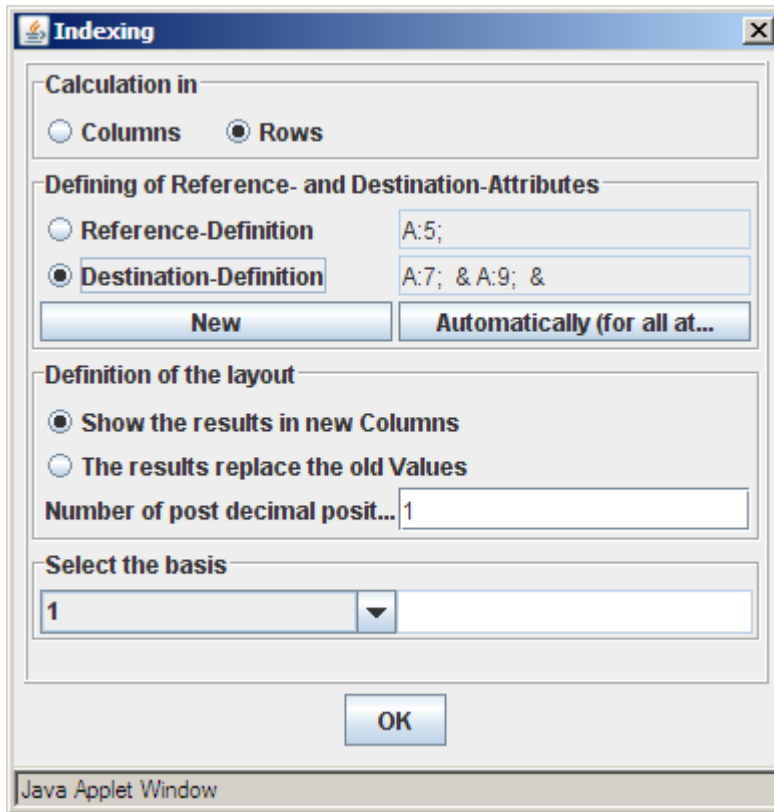


Figure 7.23: Indexing settings

1. The attributes “Gender-Total”, “Gender-Male”, and “Gender-Female” are *rows-attributes*. So you must select **Calculation in Rows**.
2. The attribute “Gender-Total” is the *base-attribute*, hence click on the row title “Total” to select the attribute as **Reference-Definition**. The coordinates “A:5” get displayed in the text box to the right.
3. After defining the base-attribute, you now can select the destination-attributes: click on **Destination-Definition** and then on the row titles “Male” and “Female”, and see the coordinates getting displayed in the text box below.
4. Default for the **basis** is ‘1’.
5. Results are going to be displayed **in new Columns**.

Figure 7.23 on page 112 shows the settings as described above. Click on **OK** to start the calculation. Look at Figure 7.24 on page 113 to see the altered table.

You can return the table to the default settings by selecting **Initial State**.

7 ICEcalc – calculations and edit functions

ICE-Spread Sheet

File Edit View Format Table Calculations Help

Functions

Table Title

Table : 1
Study demand (New entrants (1st subject-related semester),Enroled students) by Gender,
Year, Nationality (dich.) (Germ. and foreign. total)

	A	B	C	D	E	F	G
1			Nationality (dich.)				
2			Germ. and foreign. total				
3			2001	2002	2003		
4	Gender	Study demand	Number (Basis = 1)	Index Number ...	Index Number ...		
5	Total	New entrants (1st subject-related semest...	479.939	1,0	506.227	1,0	530.328
6		Enroled students	1.868.229	1,0	1.938.811	1,0	2.019.465
7	Male	New entrants (1st subject-related semest...	242.354	0,5	253.319	0,5	274.433
8		Enroled students	995.225	0,5	1.020.423	0,5	1.061.544
9	Female	New entrants (1st subject-related semest...	237.585	0,5	252.908	0,5	255.895
10		Enroled students	873.004	0,5	918.388	0,5	957.921

Sources and Notes

Source: Federal Statistical Office Germany; Main reports

Java Applet Window

Figure 7.24: Results of an indexing process

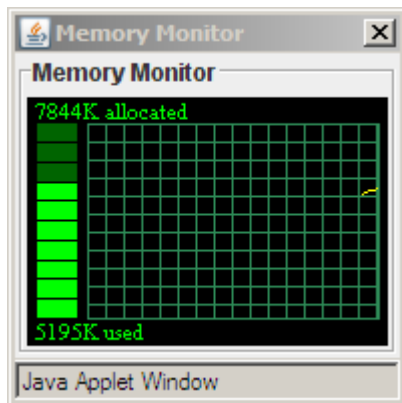


Figure 7.25: Memory monitor

7.1.7 Set invisible empty rows/columns

Particularly when handling with large tables, it may happen that whole rows and/or columns are filled with '0' or '-'. For the sake of a clear overview, it is advisable to set empty rows and/or columns invisible via the menu bar under **View**.

Remark: After cloaking rows/columns, it is not possible to make any further calculations. So better run calculations before using **Set Invisible**. You can restore cloaked rows/columns by returning to the **Initial State** (this also enables you to make calculations).

7.1.8 Memory monitor

Calling this feature opens the window **Memory Monitor** (see Figure 7.25 on page 114).

The memory monitor provides information about:

- allocated memory
- used memory
- the relation between allocated and used memory

These information can be useful, if you work with really huge tables. They enable you to trace the memory use and memory requirements of the programme.

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