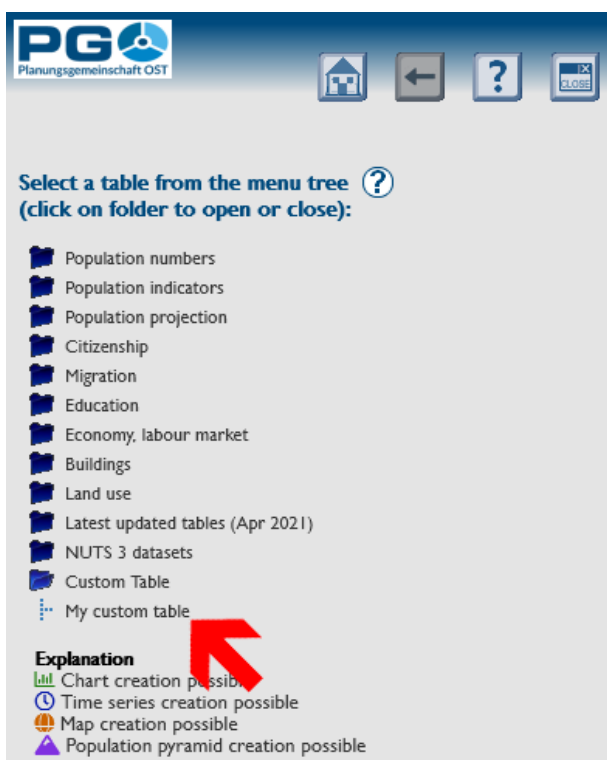


## Create a custom table



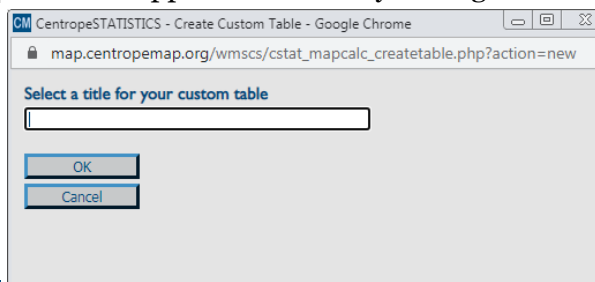
to your custom table. Enter some text in the title field, then press the “OK” button or hit the “Enter” key.

If you switch to your custom table for the first time, you can see that the table is quite empty: It shows only the



There are plenty of datasets available via CentropoSTATISTICS. Perhaps you want to create your own statistical indicators based on data from one or more tables. CentropoSTATISTICS allows you to create a temporary personal table where you can put together data from different tables and create your own values.

First of all, if you want to work with a custom table, you have to create one. Expand the “Custom Table” folder in the menu tree and click “Create custom table” (see illustration on the left). You can also load a custom table which was saved in a previous CentropoSTATISTICS session (more details are explained at the end of this chapter). If you select “Create custom table”, a pop-up window appears and asks you to give a title



municipalities and their area in m<sup>2</sup>, but nothing more. So, in the next step you have to add columns to your custom table. Hit the “Add data from other tables” button” and select the data of your choice. Or return to the start page and select any table you want from the menu tree. Open it as usual. You can see that an additional button appears on the top of each column: “Add to custom table”. Whenever you press the this button, CentropoSTATISTICS copies the selected column to your custom table (or returns a warning message if the column already exists in your custom table). During the copying process, a pop-up window appears in case of a failure. There are two reasons why data transfer could fail:

- You already added this column to your custom table. In this case, the column is not copied a second time, but you will receive a message stating “A column with this content already exists in your custom table.”
- The column does not match the area which is covered by your custom table. Field calculations and map output are done only for the geographic

The screenshot shows the CentroppeSTATISTICS interface. At the top, there is a navigation bar with icons for home, back, forward, help, and close. Below this, there are three main sections: 'Data source', 'Add data from other tables', and 'Options'. The 'Options' section is expanded, showing a table of administrative units. The table has three columns: 'code', 'name', and 'area'. The 'code' column contains values from AT10101 to AT10321. The 'name' column contains the names of the administrative units. The 'area' column contains numerical values representing the area. There is an 'Upload data' button in the top right corner of the table.

code	name	area	Upload data
AT10101	Eisenstadt	42849177.909	
AT10201	Rust	19766816	
AT10301	Breitenbrunn	25656409	
AT10302	Donnerskirchen	33989263.5	
AT10303	Großhöflein	14290276.591	
AT10304	Hornstein	37106936	
AT10305	Klingenbach	4904398.5	
AT10306	Leithaprodersdorf	18967147.5	
AT10307	Mörbisch am See	27974948	
AT10308	Müllendorf	12791953	
AT10309	Neufeld an der Leitha	4209170.5	
AT10310	Oggau	52416075.5	
AT10311	Oslip	17447650.5	
AT10312	Furbach am Neusiedler See	45978524.5	
AT10313	St.Margarethen im Bgl.	26440732.5	
AT10314	Schützen am Gebirge	21132240.5	
AT10315	Siegendorf im Burgenland	23183192	
AT10316	Steinbrunn	15391623	
AT10317	Trausdorf an der Wulka	15306106.5	
AT10318	Wimpassing an der Leitha	7888305	
AT10319	Wulkaprodersdorf	12142101	
AT10320	Loretto	2397514.5	
AT10321	Stotzing	12949281	

intersection of the data added to your table. E. g. if you add a column containing data for the whole Centroppe region and another column with data for whole Austria, all following operations will only be performed for the Centroppe part of Austria. If you try to add a column which would set this geographical intersection to an empty result, CentroppeSTATISTICS will notice this and prevent you from adding this column stating “This column does not match your table geographically. It contains only data for administrative units which are not taken into consideration within your custom table. Action not performed.”

## Upload data to a custom table

Another way to add data to your custom table is the upload function. This function allows you to add external data, i. e. datasets which are not part of the CentropeSTATISTICS cross-border database. These data has to be in a specific format to allow upload to your custom table. There are two options depending on the notation of decimals you are using. If you are using the comma (“,”) as decimal separator, your field separator is the semicolon (“;”) – option 1 on the left. If you are using the point as decimal separator, your field separator is the comma (“,”) – option 2 on the right.

Allowed data format, option 1	Allowed data format , option 2
code;value1;value2	code,value1,value2
AT90101;1;46	AT90101,1,46
AT90201;2;53,2	AT90201,2,53.2
AT90301;3;60,1	AT90301,3,60.1
AT90401;4;23	AT90401,4,23
AT90501;5;45,8	AT90501,5,45.8
AT90601;6;92	AT90601,6,92
AT90701;7;91	AT90701,7,91
AT90801;8;2,4	AT90801,8,2.4
AT90901;9;77	AT90901,9,77
AT91001;10;25,9	AT91001,10,25.9
AT91101;11;67,9	AT91101,11,67.9
AT91201;12;90	AT91201,12,90
AT91301;13;45,5	AT91301,13,45.5
AT91401;14;38,2	AT91401,14,38.2
AT91501;15;53,6	AT91501,15,53.6
AT91601;16;98,4	AT91601,16,98.4
AT91701;17;55	AT91701,17,55
AT91801;18;34,1	AT91801,18,34.1
AT91901;19;58	AT91901,19,58
AT92001;20;52,9	AT92001,20,52.9
AT92101;21;49,4	AT92101,21,49.4
AT92201;22;87	AT92201,22,87
AT92301;23;12,2	AT92301,23,12.2

Your data must be saved in CSV format (which is a common export option in spreadsheet software like MS Excel). Make sure that the column names are written in the first line. Otherwise you will lose the first line of data and get wrong column names. The first column should be named “code” and it must contain the municipality codes (starting with two letters for the country: AT, CZ, HU, or SK) as identifiers so that CentropeSTATISTICS can do a table join between your custom table and the imported CSV table.

If your datasets are formatted properly, the data is added to your custom table (which is automatically refreshed then). If your datasets fail to pass the integrity check, you are given a warning message saying “Error: The CSV file is not formatted properly.” and the data is not committed.

## The field calculator

With a custom table, you can also do your own calculations and use the output of these calculations in a thematic map. Let's explore this chapter by an example: We want to create a map of the percentage of people aged 0 to 14 living in each municipality in the year 2011. There is no table available where this percentage has already been precalculated, so we have to do the calculation on our own.

*Step 1* (if not already done): create a custom table (see chapter 4.1.).

*Step 2:* go to your custom table, hit "Add data from other tables", select "population by five-year age groups, total", then the year 2011 and the columns "population aged 00 to 04", "population aged 05 to 09", "population aged 10 to 14", and "population (absolute values)". (We will need the whole number of population in each municipality as well to be able to calculate the percentage of 0-to-14-year-olds.)

*Step 3:* Your custom table should now look like this:

name	area	age0 to 4 2019	age5 to 9 2019	age10 to 14 2019	age15 to 19 2019	population total 2011
	42849177.909	695	685	678	689	14637
	19766816	73	83	88	97	1940
n	25656409	57	83	81	74	1910
hen	33989263.5	65	79	66	85	1822

*Step 4:* Step 4: Notice the empty column on the right end of the table. One of the buttons above it says: "Create new column". Press it and you will be asked to enter a name for your new column. We need an empty column where we can store the result of our field calculation. According to the other column names, we will now give it the name "age0\_to\_14\_2011\_percent". The custom table is refreshed and the new column appears, together with two additional buttons: "Field calculator" (which we will use right in the next step) and "Reclassify". Your custom table looks like that now:

code	name	area	age0 to 4 2019	age5 to 9 2019	age10 to 14 2019	age15 to 19 2019	population total 2019	age0 to 14 2019 percent
AT10101	Eisenstadt	42849177.909	695	685	678	689	14637	0
AT10201	Rust	19766816	73	83	88	97	1940	0
AT10301	Breitenbrunn	25656409	57	83	81	74	1910	0
AT10302	Donnerskirchen	33989263.5	65	79	66	85	1822	0

*Step 5:* Press the buttons as if you were using any standard desk calculator or use your keyboard. The "C" button lets you undo your last calculator action, i. e. remove a digit, an operator or a column name from the formula field. If you press "OK", the formula will be checked for errors. If errors are found, you will receive a warning message "Syntax error!".

Here is a step-by-step example how to create a formula. We have population by age groups (0-4, 5-9, 10-14) and want to calculate the percentage of 0-to-14-year olds of total population. It is necessary to sum up the three age groups 0-4, 5-9, 10-14, divide the sum by the total population and multiply the result with 100 to receive percentage values in a range of [0..100]. Remember that according to mathematical rules multiplicative operations (multiplication and division) take precedence over additive operations (addition and

The screenshot shows the 'CentropeSTATISTICS Field Calculator' window. On the left, a list of columns is visible: [area], [age0\_to\_4\_2019], [age5\_to\_9\_2019], [age10\_to\_14\_2019], [age15\_to\_19\_2019], and [population\_total\_2019]. The main formula field contains the text '[age0\_to\_19\_2019\_percent] ='. Below the formula field are buttons for 'OK', 'Cancel', 'Clear all', and 'Help'. At the bottom, it states 'Rows affected: 3507, estimated calculation time: 9 seconds.' Four callout boxes with red arrows point to specific parts of the interface:

- All columns from your custom table can be selected from here: click on the column name to add the column to your formula.** (Points to the column list)
- Calculator buttons** (Points to the numeric keypad)
- Formula field. The formula you create step by step is shown here.** (Points to the main text input area)
- Press "OK" to calculate. "Cancel" closes the field calculator, "Clear all" deletes the formula.** (Points to the bottom buttons)

subtraction). So we have to put the addition into brackets which means your first button should be “(“. Then you click on “age\_o\_to\_4\_2011”, hit “+” ... and so on until you clicked age\_10\_to\_14\_2011. After that, the addition is complete, so we have to close the bracket. Multiplication and division are still remaining. As both operations have the same hierarchical level in mathematics, it does not matter which one comes first. The field calculator should now look like on the right – the formula is entered and we are ready to press the “OK” button to start the field calculation. The estimated calculation time is shown at the bottom of the field calculator window. With every press of the “OK” button, the formula is given an integrity check. Calculation is only done with a correct formula, otherwise the field calculator returns a “Syntax error”.

This screenshot shows the same field calculator window after the formula has been entered. The formula field now contains: 
$$\left( \left[ \text{age0\_to\_4\_2019} \right] + \left[ \text{age5\_to\_9\_2019} \right] + \left[ \text{age10\_to\_14\_2019} \right] + \left[ \text{age15\_to\_19\_2019} \right] \right) + \left[ \text{population\_total\_2019} \right] \times 100 \uparrow$$
 The 'OK' button is highlighted in blue, indicating it is the next step to execute the calculation. The status bar at the bottom remains 'Rows affected: 3507, estimated calculation time: 9 seconds.'

*Step 6:* The field calculation is done and the custom table is refreshed. In our column “age0\_to\_14\_2011\_percent” we can now see the results of our field calculation for each municipality. To create a map from these data, just press the button labelled “Map” and proceed like told in chapter 5 (Create a choroplethic map).

## Data reclassification

Data reclassification allows you to create separate data classes from columns containing continuous values. This can, for example, be useful if you want to exclude municipalities with a certain attribute range for further calculation: Set the unwanted range to a reclassification value of zero and use the field calculator for a multiplication. Then you can treat the attribute value of zero as “no data” in your map.

CentropeSTATISTICS Reclassification - Google Chrome

map.centropemap.org/wmscs/cstat\_mapcalc\_reclass.php?tar

Reclassifying age0\_to\_19\_2019\_percent ?

Minimum value: 0 ?

Maximum value: 39.13 ?

from	to	New value
0.00	19.57	0
19.58	39.13	1

Add row ?

Delete row ?

OK ?

Cancel

Start reclassification by clicking “Reclassify” on top of a column of your custom table. (Note: Reclassification is only available for own calculation results. If you want to reclassify existing values, you need to copy these values into a new column – create a new column and set it equal to the column of your choice with the help of the field calculator.

The reclassification window starts with two rows of data reclassification. To add rows (i. e. to add reclassification value ranges), click on “Add row”. Make sure that the “to” value is not lower than the “from” value of the next line. If a “to” value lower than the “from” value of the next line is discovered, the “from” value of the next line turns red to draw your attention to a field not having a proper value inserted. Press the “OK” button to start reclassification. The result is added as separate row to your custom table, so the values before reclassification are not overwritten.

## Data aggregation

Almost all datasets in the CentropeSTATISTICS cross-border database are provided on municipality level. A few datasets are available on NUTS 3 level only. To be able to combine these datasets, CentropeSTATISTICS offers the possibility to aggregate municipality level data to district and NUTS 3 level. Directly above your custom table there is an “Options” section. Expand it by clicking on the word “Options”, then you can see an “Aggregate” button if data in the table is on municipality level. Press the button to open the aggregation function in a separate pop-up window. For aggregation you can choose between various aggregation methods:

The screenshot shows a data table with the following content:

code	name	area	age0_to_4_2019	age5_
AT10101	Eisenstadt	42849177.909	695	
AT10201	Rust	19766816	73	

Press the button to open the aggregation function in a separate pop-up window. For aggregation you can choose between various aggregation methods:

- SUM (add all values within area)
- MAX (find highest value within area)
- MIN (find lowest value within area)

**Table Aggregation** ?

Aggregate to district level

Aggregate to NUTS 3 level

---

SUM (add all values within NUTS 3 area)

MAX (find highest value within NUTS 3 area)

MIN (find lowest value within NUTS 3 area)

MEAN (calculate arithmetic mean within NUTS 3 area)

MEDIAN (find the median within NUTS 3 area)

WEIGHTED MEAN (calculate arithmetic mean and weight it by area)

< Decimals: 2 >

OK

Cancel

**Caution: Execution of this function cannot be undone.**

- MEAN (calculate arithmetic mean within area)
- MEDIAN (find the median within area)
- WEIGHTED MEAN (calculate arithmetic mean and weight it by area)

Select the desired number of decimals, then press “OK” to start aggregation. Caution: The execution of the aggregate function cannot be undone; this means: Once you converted the contents of your table from municipality level data into NUTS 3 or district level data, you cannot convert the data back to municipality level, and you also cannot add data from municipality level tables to your custom table any more!

## Save and load a custom table

At any time you can save the contents of your custom table to a file which you can store locally on your system. This option allows you to continue work with your custom table at any later time, or to share a custom table with colleagues. To download the custom table to your local workspace, go to the start page of CentropeSTATISTICS by clicking the “Home” button, then press “Save custom table”. A pop-up window appears. At first, it will display “File transfer...” during the creation of the custom table file on the CentropeSTATISTICS server. As soon as the file is ready for download, it is directly sent to your computer. You will receive the message “Table export completed.” as well as a prompt to save a file to your computer.

Select “Save” from this prompt. Do not select “Open” because there is no piece of software on your computer you could open this file with. The default file name is always “customtable.cstat” but you can change it to whatever you like.

For security reasons (i. e. to prevent malicious code from being transferred from outside), the local copy of your custom table is stored in a non-human-readable format. To be able to work with a custom table file, you have to load it into CentropeSTATISTICS using the “Load custom table” button on the start page of CentropeSTATISTICS.

If you have already created a custom table in your current CentropeSTATISTICS working session, the uploaded table will overwrite the existing one, so make sure you save this table first if you do not want the data in it to be lost.

The “Load custom table” window prompts you to select a file from your local filesystem to be uploaded to the CentropeSTATISTICS server. After you selected a file and pressed the “OK” button, the file is transferred to the CentropeSTATISTICS server, decrypted and checked for integrity. If it passed the integrity check, the custom table is embedded into your working session and the pop-up window closes.

If the file fails to pass the integrity check, CentropeSTATISTICS throws the message: “Invalid contents in uploaded file. Data not processed.” In this case, the custom table file is corrupt and the data inside lost.

