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Digital Area for Networking
Teachers and Educators

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Data Analysis Using Lists

Sorting and Filtering

WEEK 2

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Sorting the List

Sorting the list means changing the order of the entire rows of the list according to the values of one column or several columns. To sort a list, don't select the entire list, just select any cell in the list. If only part of the list is selected, Excel will sort only that part of the list and not the whole list, and you usually don't want that.

Sort the List by One Column

To sort the list by one column, click that column, on the **DATA** tab, choose **SORT FROM SMALLEST TO GREATEST** or **SORT FROM GREATEST TO SMALLEST**. However, if your table contains only text data, Excel will not recognize that the table contains header and will shuffle the header between the rows of data. In this case, it is necessary to choose a sorting method using the **SORT** dialog box, see the following chapter.

Sort the List by Multiple Columns

If you want to sort the list by multiple columns, click anywhere in the list and on the **DATA** tab in the, choose **SORT**.

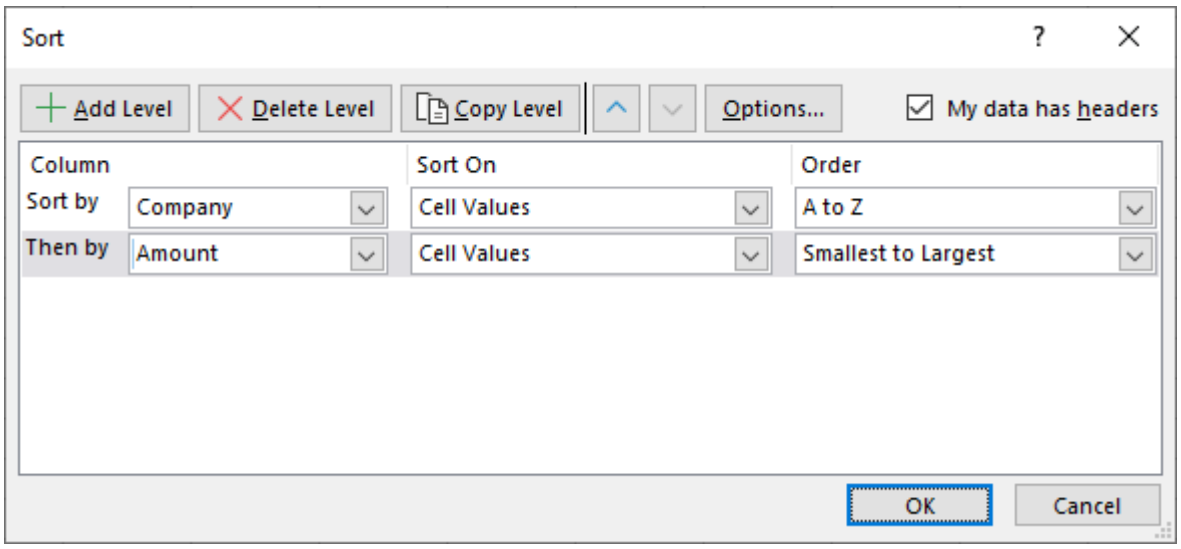

Figure 1 Dialog box Sort

In the **SORT** dialog box, it is possible to use the buttons to add new sorting levels or remove existing ones, or change their priority. Equally important is the **MY DATA HAS HEADERS** check box in case Excel does not automatically detect that the table contains a header. This happens especially in cases where the table contains only text data.

Sorting the List by Your Own Order

The default sorting order in the **SORT** dialog box is always ascending, that is, from smallest to largest. Using the **ORDER** combo box, you can easily change to descending order, i.e. from largest to smallest.

However, if you wish to use your own order, you must create your own list (not to be confused with the lists we are talking about here) determining the order of the data and then use it to sort the table. Custom lists can be created using the **FILE** tab - **OPTIONS** - **ADVANCE** tab - in the lower part of the window, click the **EDIT CUSTOM LISTS** button. The **CUSTOM LISTS** dialog box opens. In the **CUSTOM LISTS** dialog box, in the **CUSTOM LISTS** list, choose the **NEW LIST** item and in the LIST ENTRIES field, write the list items in the exact order in which they should be used to sort the table. You can add a new list by clicking the **ADD** button. It can be deleted again with the **DELETE** button. If you already have a list of items in the desired order prepared in the cells of the sheet, it is not necessary to write them in the **CUSTOM LISTS** dialog, but it is possible to import them using the **IMPORT** button.

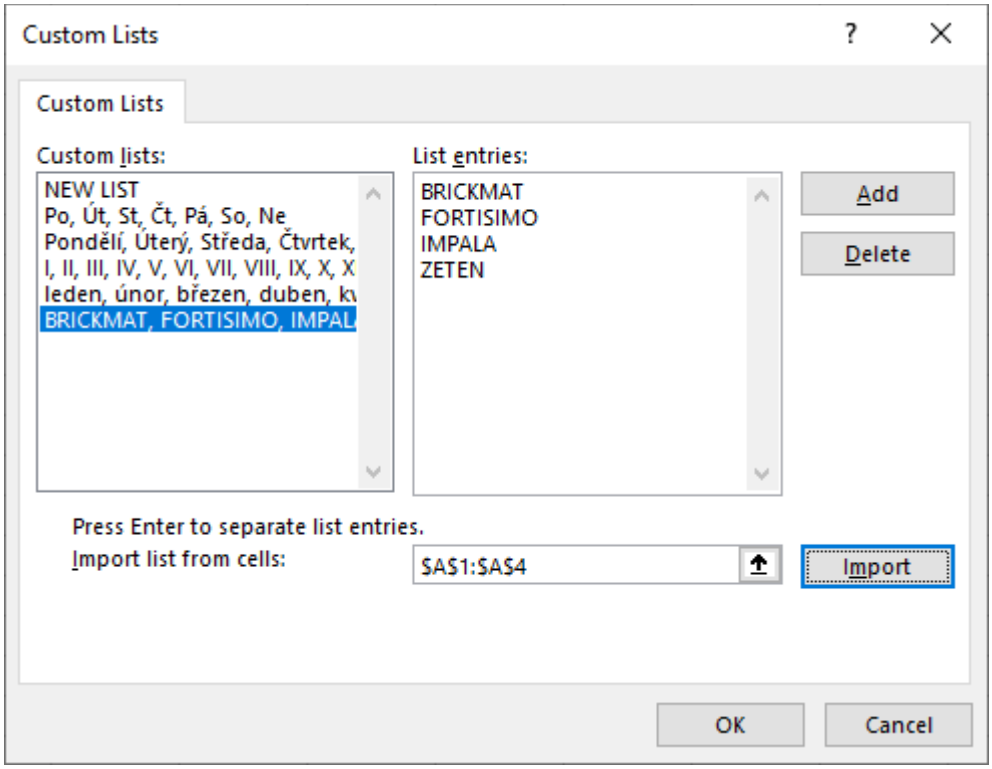

Figure 2 Dialog box Custom Lists

Once you have your custom list created, you can easily use it to sort the table in the **SORT** dialog box, in the **ORDER** combo box, choose **CUSTOM LIST**.

Filtering the List

The goal of filtering is to select only those rows from the rows of the list that meet the specified selection criteria. Rows that do not meet these criteria will be hidden.

Excel provides two methods of filtering:

- **Automatic filter** – enables basic filtering methods. The limitation of the automatic filter is only the logical AND relation between two selection criteria (logical OR is not possible).
- **Advanced filter** – except advanced filtering methods (e.g. logical OR), it also allows you to copy the filtered data to another range, remove duplicate rows, etc.

Automatic Filter

If you want to use an automatic filter, select any table cell you want to filter. The entire table will be filtered. If you would select only some cells of the table, then only the selected cells will be filtered.

You turn on filtering on the **DATA** tab with the **FILTER** button. Filter combo boxes will appear in the table header. For the field you want to filter by, open filter combo box and select one of the following options:

- If you want to filter by one or more specific values, select them using the check boxes.
- But if you would like to select continuous ranges of values, e.g. all values less than something or values in some interval, it is possible to use special filter operators, but they differ according to the data type of the column. Number columns offer **NUMBER FILTERS**, text columns offer **TEXT FILTERS**, and date columns offer **DATE FILTERS**.

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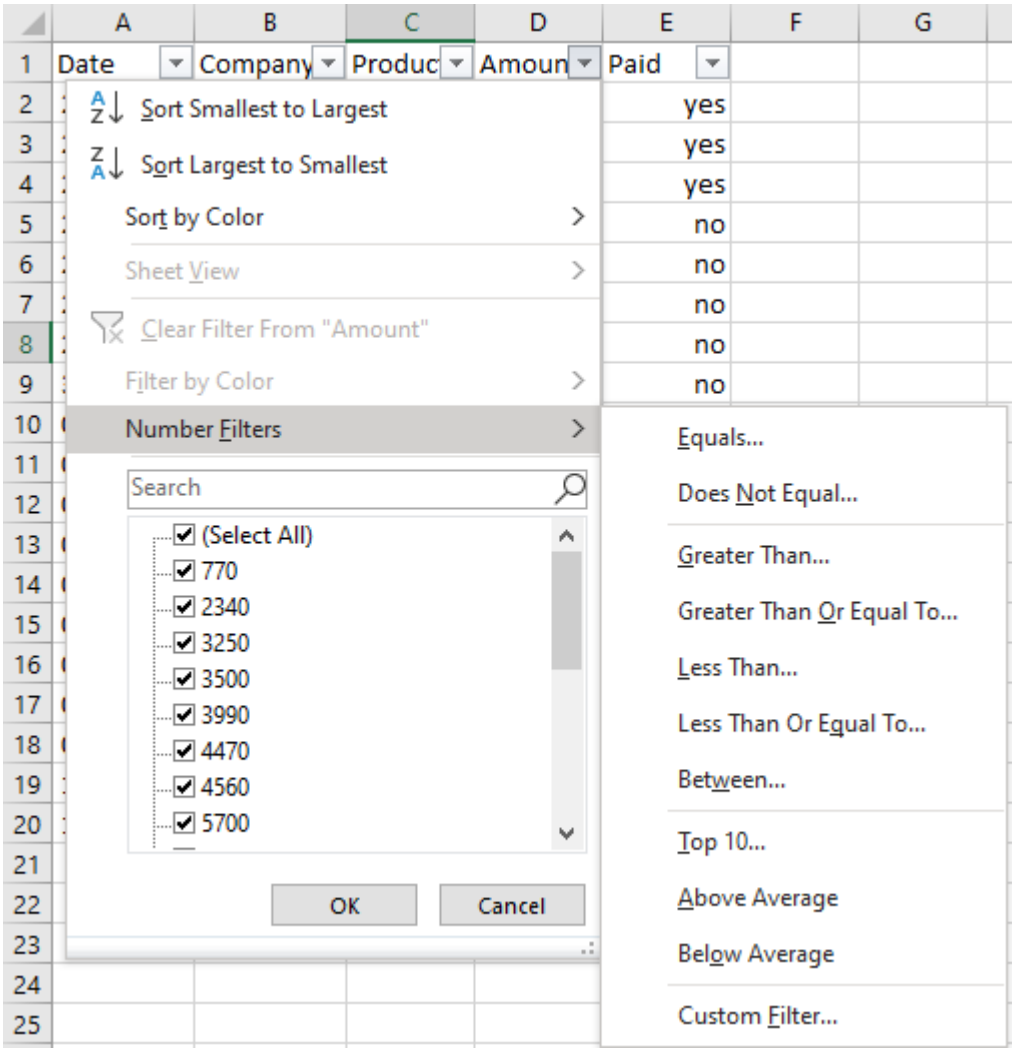

Figure 3 An example of using the automatic filter

By filtering, only the rows that meet the selection criteria are displayed in the list, the other rows are hidden. The Excel status bar shows the original number of rows and the number of filtered rows. You can further limit the selected records by further filtering. The fields used for filtering are marked in the automatic filter combo boxes.

You can clear the filter on the **DATA** tab with the **CLEAR** button, or with the **CLEAR** menu in the automatic filter combo box. You can turn off the automatic filter completely on the **DATA** tab by clicking the **FILTER** button again. Not only the filter will clear from the table, but the automatic filter combo boxes will also disappear.

Data Analysis Using Lists

If you use multiple criteria on multiple columns, the logical AND always applies among them ("and at the same time"). If you require a logical OR ("one or another"), you must use an advanced filter.

The advantage of filtering is not only the possibility to see only the selected rows of the table, but also to calculate something above these filtered rows. This course will deal with calculations in the following chapters. Nevertheless, one function should already be mentioned at this point. That function is the SUBTOTAL function. Unlike basic functions such as SUM or AVERAGE, the SUBTOTAL function calculates with a filter, so it performs the calculation only from the filtered rows of the table. No other function has this ability. E.g. the SUM function in the filtered table performs the sum even from the values of the cells hidden by the filter.

The SUBTOTAL function returns a sum of the values in the list and has the following syntax:

SUBTOTAL(function_num,ref1,[ref2],...)

- **Function_num**: Required. The number 1-11 or 101-111 that specifies the function to use for the subtotal. 1-11 includes manually-hidden rows, while 101-111 excludes them; filtered-out cells are always excluded.

Table 1 Possible values of Function_num parameter of SUBTOTAL function

Function_num (includes hidden rows)	Function_num (ignores hidden rows)	Function
1	101	AVERAGE
2	102	COUNT
3	103	COUNTA
4	104	MAX
5	105	MIN

Function_num (includes hidden rows)	Function_num (ignores hidden rows)	Function
6	106	PRODUCT
7	107	STDEV
8	108	STDEVP
9	109	SUM
10	110	VAR
11	111	VARP

- **Ref1**: Required. The first named range or reference for which you want the subtotal.
- **Ref2**: Optional. Named ranges or references 2 to 254 for which you want the subtotal.

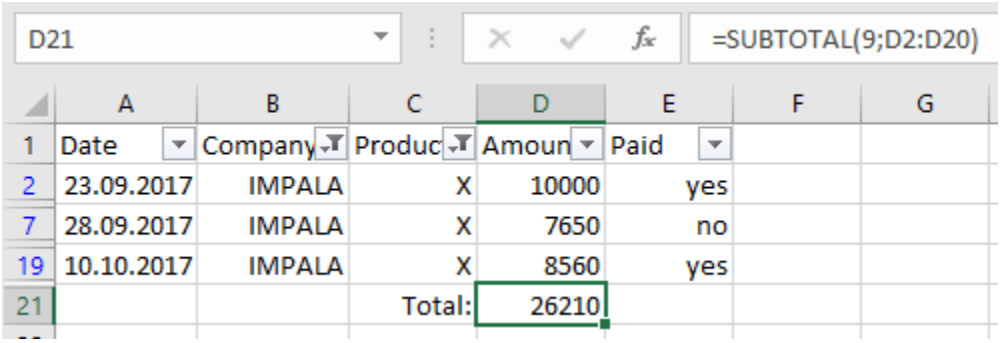

Figure 4 Example of using the SUBTOTAL function in a filtered table

Advanced Filter

The advanced filter allows you to perform even more complex filtering based on the criteria specified in the special criteria area. The usual procedure for using an advanced filter is as follows:

- Insert a few empty rows above the table you want to filter.
- In the first row of the empty cell range above the table, copy the header of the table you want to filter.

- Fill the selection criteria (criteria range) in the next lines. Criteria listed in one row apply simultaneously (AND), criteria in different rows mean one or the other (OR). The criteria range must therefore have at least two rows and doesn't have to contain all the columns that the filtered table contains. Specific values can be used as selection criteria, but common relational operators such as <, >, <=, >=, <> can also be used, metacharacters * (replaces 0 to several arbitrary characters) or ? (replaces 1 character at the given position). An empty cell in the criteria area means selecting all values.
- Click anywhere in the table you want to filter and choose the **ADVANCED** button on the **DATA** tab. This will open the **ADVANCED FILTER** dialog box. The list area is probably already selected correctly, select the **CRITERIA RANGE**. You can **FILTER THE LIST, IN PLACE** or you can data **COPY TO ANOTHER LOCATION**. In that case, it is necessary to select one cell in the **COPY TO** field, which will become the upper left corner of the range to which the filtered data will be copied. If the **COPY TO** range contains only the headers of some columns, then only those will be copied and the other columns will not be used.
- Confirm the **ADVANCED FILTER** dialog box.

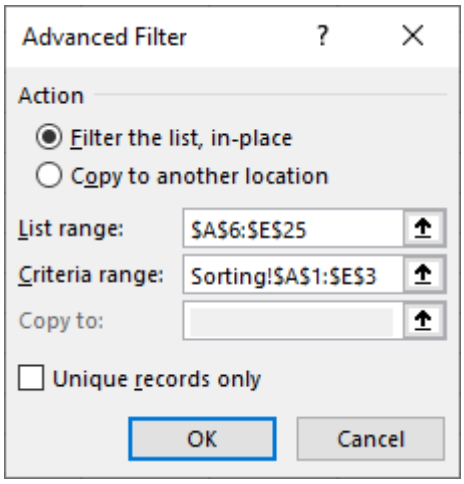

Figure 5 Dialog box Advanced Filter

If you applied the advanced filter directly in the list, you can clear it in the same way as the automatic filter, i.e. with the **CLEAR** button on the **DATA** tab.

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