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**Advanced spreadsheets –
Microsoft Excel 2010**

Handbook

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Today's society is characterized by rapid growth and development of information technology (IT), which resulted in a great dependence of society, in a broad sense, of the knowledge and competence in the IT field. And although that dependence is growing from day to day, **human rights to education and information** is not extended to the IT area. There were problems that affect society as a whole, creating gaps and distancing people from the main reason and motivation for advancement, from **opportunity**. Being a computer illiterate, today it means to be a person unable to participate in the modern society, to be a person without opportunity. Despite the recognition of the European Commission, UNESCO, OECD and other relevant institutions on the necessity and benefits of literacy, there are still groups of people with hindered access to basic computer education (eg. persons with disabilities, people with learning difficulties, workers / and migrants, the unemployed, people living in remote places where education is not accessible).

This manual, together with other materials published on ITdesk.info, is our contribution to the realization and promotion of human rights to education and information in the field of IT. We hope that this education will help you in mastering basic computer skills and we wish you to learn as much as you can and thus becoming an active member of the modern IT society.

Sincerely yours,

 ITdesk.info team

CONTENT

1.   DESIGN

1.1   CELLS

A cell is an intersection between a column and row.

In order to increase the transparency, ease of use and for a better visual presentation Excel offers the ability to create cells at predefined templates, which a user can format, when desired.

Apply automatic formatting/table style to a range of cells

- Select the cells you want to shape
- **Go to Home -> Styles -> Format as table**
- Select the desired style

Apply conditional fortmatting based on cell content

Sometimes it is necessary to create the data in such a way that the design is changed depending on a condition which is given before. This allows,, a different color to highlight certain numbers for you to have a special meaning (eg. temperature more than the average).

In order to change the conditional formatting you need to:

- Select a cell or a range of cells over which you wish to apply conditional formatting
- **Go to Home -> Styles -> Conditional formatting**
- Select the desired conditional formatting.

Let's say you want to highlight the temperature more than the average, then to highlight the table with data and click on "greater than" where you would be asked to enter a value by to make comparisons, so you can choose the color you want the cells to be painted or assigned with.
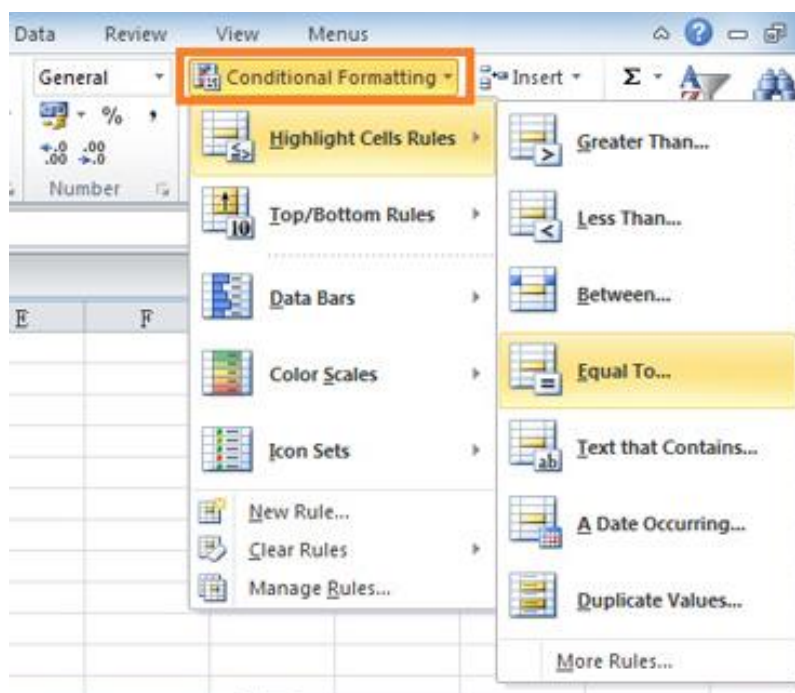
Create and apply custom number formats

By applying different formats of the numbers they can be displayed as a percentage, date, currency, etc.

- Select the cells you want to shape
- **Go to Home** -> **Number**
- Click **Dialog Box Launcher** next to number (or press CTRL+1).
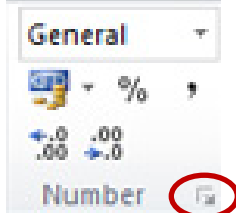
- In the **Category list,** click the format you want to use and then adjust the settings as needed.

1.2 WORKSHEET

An Excel **worksheet** is the grid of cells where you can type the data. The grid divides your worksheet into rows and columns.

Copy, move worksheets between spreadsheets

First select sheets you want to move or copy.

- One sheet is selected by clicking on the a sheet tab.

- Select two or more adjacent sheets: click on a tab the first list then hold down the SHIFT key while clicking the last tab lists you want to choose.

- Select two or more sheets of non-adjacent: click on a tab the first list then hold down the Ctrl key and simultaneously click on other sheets you want to select

- All sheets in a workbook: right-click a sheet tab and then click on the shortcut menu on Select all sheets.

- **Go to Home -> Cells -> Formatting**, and then under **Organize sheets** select **Move or Copy sheet**.
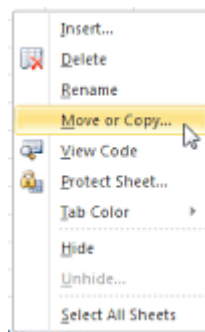
- A shortcut for this option is to right click the mouse after selecting the sheets to open the shortcut menu.

- In the dialog box to **Move or copy** the sheet in **The Book,** you can click on an existing workbook in which you want to move or copy the selected sheets, or you can click on a **new book** that you selected, and move or copy sheets in a new workbook.

- In the **Before sheet** field you can choose exactly to which location in another workbook you want to move or copy worksheets (before the selected sheet, at the end).

To copy sheets rather than move them, the dialog box, tick the check box in front of the **Create a copy.**

NOTE: When you create a copy of a worksheet, a duplicate of a worksheet is created in the destination workbook and appears only in the destination workbook. When you move the worksheet, it is removed from the original workbook and appears only in the destination workbook.

Split window. Move, remove split bars

Standard division implemented by Excel is a division of the window into 4 sections. It is achieved by selecting **View -> Window -> Split**. Click again on the Split and the division is removed.

For an arbitrary horizontal division into two parts is necessary to select the row below the row on which you want to split the sheet, and click **Split**. The division is removed by clicking Split.

The window can also be divided by columns. Select the column to the right of the column where you want to split and then use **Split**. Worksheet can be split both per rows and columns. Select the cell below and on the right of place where you want to split, then click **Split**.

Another way to split a window is to select a cell and then quickly click on the bar two times for horizontal or vertical division. The horizontal division tape is located above the slider for vertical movement and the vertical division tape is on the right of the slider for horizontal shift.

Bar division can be moved as desired so with a left click on the mouse you can drag it to the desired location.

Hide, show rows, columns, worksheets

- To hide one or more rows or columns: select the rows or columns you want to hide. **Home -> Cells -> Format**. For hiding there are 2 available options:
- In the section **Visibility** click on the **Hide rows** or **Hide columns**.
- In the section **Size** click on the **Height row** or **Column width**, and then enter 0 in the frame **Height row** or **Column width**.

Shortcut to hide columns/rows is right clicking the mouse on the row or column (or more) and then click on **Hide**.

- To show a hidden row select the line above and below the hidden row you want to view and for column select adjacent columns. **Home -> Cells -> Format**. For detection there are available 2 options:
- In the section **Visibility** click on **Unhide rows** or **Unhide columns**.

- In the section **Cell size** click on **Height rows** or **Column width**, and then insert the desired value.

Shortcut to detect rows / columns is to click the selection of visible rows and columns that surround the hidden rows and columns, right-click and then click **Unhide**.

- <u>A special case is the first detection of a hidden row or column</u>. To select the first hidden rows or columns in a worksheet, you can follow the below steps:
- In the name box next to the formula bar enter A1
- **Home -> Edit -> Find and select -> Go to**. In the frame **Reference** enter A1 and then click **OK**.

For detection the previously listed options are available.

In hiding the worksheets you should keep in mind that while you can hide multiple worksheets, you can only discover each sheet separately.

For hiding the worksheets select the desired sheet and then in the **Home tab -> Cells -> Format.** Under **Visibility** click on the **Hide sheet**.

For detection go to **Home tab -> Cells -> Format**. Under **Visibility** click on the **Hide sheet**. Within **Unhide** double-click the name of the hidden sheet you want to display.

2.   FUNCTIONS AND FORMULAS
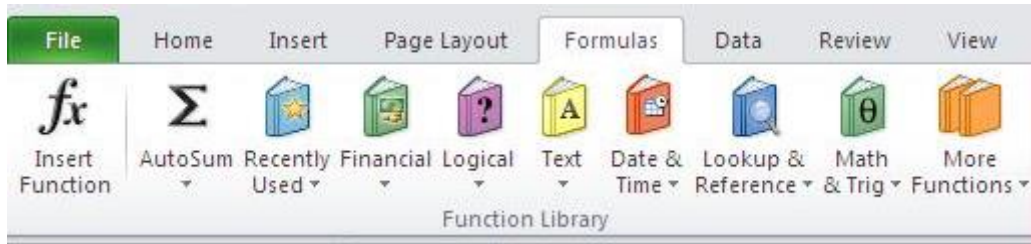
Functions are predefined formulas that perform calculations by using specific values, called arguments, in a precisely defined order or structure. The functions can be performed by various calculations.

Formulas and functions are available in the **Formulas** tab. In most cases, selecting the desired formula opens additional window with which you can specify arguments.

For example, help window for SUM function:
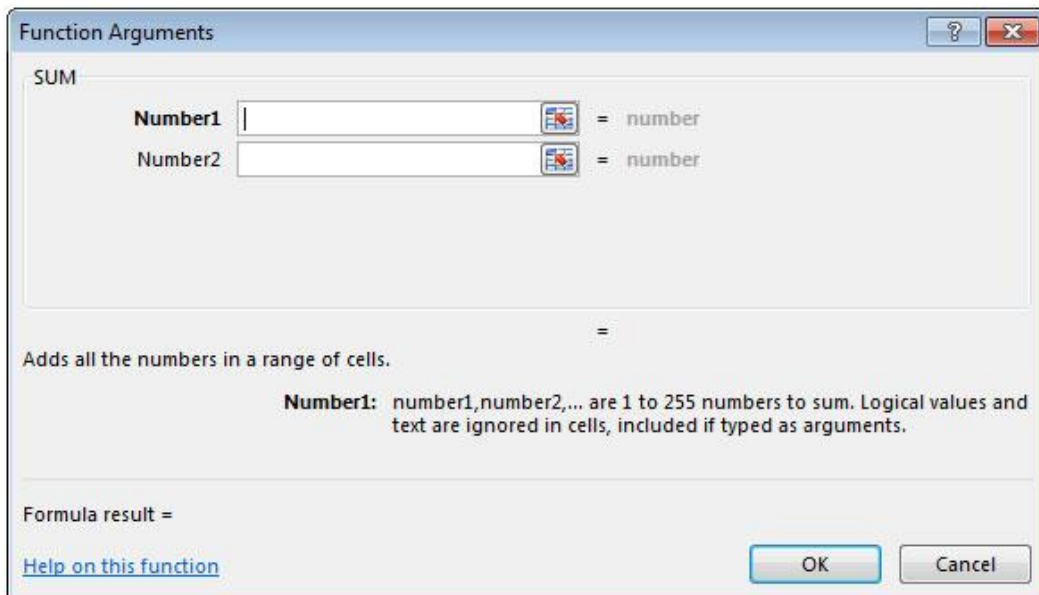
The use of functions and formulas TODAY, NOW, DAY, MONTH, YEAR

Use date and time: TODAY, NOW, DAY, MONTH, YEAR.

-   **TODAY()** -> returns the current date. If you select a cell in the formula bar and enter =TODAY() the cell will display the current date.

-   **NOW()** -> returns the current date and time. If you select a cell in the formula bar and enter =NOW() in the cell it will display the current time.

-   **DAY(ordinal number)** -> Ordinal number is the date of the day your are trying to find. Dates must be entered by using the DATE function or as results of other formulas or functions. For 14 november 2008, for example, use =DATE(2008,11,14). If you select in cell A1 using the tool TODAY() store the current date, and then highlight the cell A2 and enter the formula bar =DAY(A1) you will get the day of the month (ranging from 1 to 31).

- **MONTH(ordinal number) and YEAR(ordinal number)** work on the same principle as DAY(ordinal number) except that MONTH returns a number that represents the month, and YEAR returns the year.

Use mathematical functions: ROUNDDOWN, ROUNDUP, SUMIF

- **ROUNDDOWN(number; number of digits)** -> number rounded to the lower number closer to zero. Receives 2 arguments, namely the number of which is desired to encircle the lower value and the number of digits in the code that wants to encircle.

  - If the number of digits is greater than 0 (zero), the number is rounded down to the specified number of decimal places.

  - If the sum of digits equal to 0, the number is rounded to the nearest whole number.

  - If the number of digits is less than 0, the number is rounded down to the specified number of places to the left of the decimal point.

  Examples:

  =ROUNDDOWN(5,8; 0) -> rounded to a smaller number so that there are no decimal places and the result will be 5.

  =ROUNDDOWN(5,123456; 3) -> completes the given number 3 to decimal places and the result will be 5,123

- **ROUNDUP(number; number of digits)** -> rounded up to the number further from 0. Receives 2 arguments, which are the number of which is desired to round up to a higher value and the number of digits in the code that wants to encircle.

  - If the number of digits is greater than 0 (zero), the number is rounded up to the specified number of decimal places.

  - If the sum of digits is equal to 0, the number is rounded to the nearest whole number.

  - If the number of digits is less than 0, the number is rounded up to the left of the decimalpoint.

  Examples:

  =ROUNDUP(52,4; 0) -> the larger the number is rounded with no decimal places and the result is 53

  =ROUNDUP(3,14182; 3) -> number rounded to three decimal places and the result is 3,142.

- **SUMIF(range;criteria[range_sum])** -> is used for adding value in a range that satisfy these criteria. For example, in a column you want to add up only the numbers that are less than 9, formula would read =SUMIF(C1:C15;"<9"). It accepts two mandatory arguments, namely the range of cells to which we want to apply the function and criteria in the form of a number, expression, cell reference or text that defines the functions that will be added to the cells. Some examples of the criteria are 15, ">12", D2, "student" or TODAY(). In addition, accepted is also range_sum but it is not

mandatory. It represents the actual cells that need to be added if you want to add some other cells other than those specified in the range argument. If the argument range_sum is omitted, Excel counts cells that are designated in the argument (the same cells which are subject to the criteria).

A7			f_x	=SUMIF(A2:A5;"Toys";C2:C5)				
	A	B	C	D	E	F	G	H
1	Category	Article	Price					
2	Toys	Doll	20					
3	Cosmetics	Shampoo	12					
4	Toys	Toy car	9					
5	Food	Biscuits	10					
6								
7	29							

In this case we have the formula =SUMIF(A2:A5, "Toys", C2:C5) and let's say that we want to get the sum of all prices for the products that fall into the category of Toys.

Use statistical functions: COUNTIF, COUNTBLANK, RANK.

COUNTIF(range; criteria) -> counts the number of cells within a range that meet only the criteria you specify. Receives 2 required arguments, namely the range of cells to be counted and the criteria of number, expression, cell reference or text string that defines which cells will be counted. If for example we want to count how many times in a column number 10 appears, we will write it down as =COUNTIF(A2:A20; 10).

If the number 10 appeared in 3 cells then we will get the number as a result.

COUNTBLANK(range) -> counts the number of empty cells in a specified range. Receives only one mandatory argument which is the range. If, for example, we want to count how many times the blank cells in a range appear, then we will write it down as =COUNTBLANK(A2:A20). If there were 4 empty cells then we get that number as the result.

RANK(number;ref;[order]) -> returns the number in a list of numbers. The number position is of its relative size in relation to other values in a list. If you look at it as sorting, then the number position will be its position. Receives 3 required arguments, namely the number whose position you want to find, reference or field numbers list or a reference to a list of numbers ant the order or number that specifies how to determine the position number. If the argument is the order of 0 or omitted then the ranking is done as if the argument ref list is sorted first, otherwise the ranking is done as if the argument ref list is sorted in ascending order.

It is important to emphasize that RANK gives duplicate numbers to the same position, but the existence of duplicate numbers affects the position of the numbers that follow. If, for example, in a list of integerwhich are in ascending order, the order of the number 5 appears 2 times and has 3rd position then the number 6 have 5th position (no number would have a position of 4).

If, for example, in column A we have the value: 9, 2, 3.5, 8, 4, 5, 5 and write =RANK(A6,A1:A7,1) and we want to know the position of the number at the position A6 (in this case it's number 5), we have to set the range of cells from A1 to A7 and as the order of

the given number 1, which means that the numbers will be sorted in ascending order. As a result we get the number 4, and number 5 is the largest in the series in fourth place.

Use text functions: LEFT, RIGHT, MID, TRIM, CONCATENATE

LEFT(text; [number_characters]) -> returns the first character or characters from the left side (from the beginning of the text) of a text based on the number of characters to be specified. Receives 2 arguments from which the text is optional and refers to the text string containing the characters you want to extract and number_characters, which is an option, specifies the number of characters that a function will allocate. If number_characters appears must be greater or equal to zero. If it is greater that the length of the text it returns to the full text, if the number of characters are omitted, then it's assumed to be 1.

If in the cell A1 we have text "Excel" and write =LEFT(A1,2) we get the result as Ex.

RIGHT(text; [number_characters]) -> is equivalent to LEFT but returns the first character or characters from the right side (from the end of the text).

MID(text; initial_number; number_characters) -> function returns a number of characters from a text string starting from the point that you specify on the basis of a number of characters. Receives 3 required arguments, and they are text that contains characters which are to be set aside, initial_number or the location of the first character you want to stand out from the text and number_characters gives the number of characters that you want, which the MID function returns.

- If the argument is, that the initial_number greater than the length of text, MID function returns "" (empty text).

- If the initial_number is less than the length of the text and the sum of the arguments initial_number and number_characters exceeds the length of the text, MID function returns signs at the end of the text.

- If the argument initial_number is less than 1, MID function returns wrong #VALUE!.

- If the argument number_characters is negative, MID function returns wrong #VALUE!.

Suppose that in cell F1 is the text "Mathematics". If we write the function =MID(F1,3,4) we get "theme" as a result.

TRIM(text) -> removes all spaces from text, except for single spaces between words. Receives only one mandatory argument, which is the text from which they want to remove the gaps.

If in the cell A1 is the text "Today is a beautiful day", with the function =TRIM(A1) we will get as a result "Today is a beautiful day", or they would be removed intervals from the beginning of the text.

CONCATENATE(text1, [text2], ...) -> function that combines several text strings into one text string. Concatenation can be for text, numbers, cell references or a combination of both. Receives one mandatory parameter, text1, and is the first string that should be attached. Other parameters are optional and represent other sequences that you want to connect.

If, for example, in one column we have the names of students and in the second their last name and full name, we can get with =CONCATENATE(A1," ",B1). The second argument in this example is (" ") or space. Be sure to specify the spacing and punctuation that you want

to appear in the final result. Sign & is equivalent to CONCATENATE function, and = A1 & B1 returns the same as = CONCATENATE(A1, B1)

	C1	▼	f_x	=CONCATENATE(A1, " ", B1)	
◢	A	B	C	D	E
1	Petar	Peric	Petar Peric		

Use financial function: FV, PV, PMT

FV(rate; grooves; rate;[sv]; [type]) -> shows the future value of an investment based on periodic, constant payments and interest rates.

Receives the following arguments:

- Rate – It is mandatory. The interest rate per period.

- Grooves –It is mandatory. Total annuity payment period.
- Rate –The repayment in each period; can not be changed during the life of the annuity. Rate usually contains principal and interest without additional taxes and charges. If you omit the rate, you must enter argument sv,which is entered as a negative number.
- Sv –It is optional. The present value or the total sum of the present value of the stream of future payments. If sv is omitted, is assumed to be 0 (zero), then you must specify the argument rate.It is entered as a negative number.
- Type – It is optional. Number 0 or 1 indicates when the payments are due. If the type is omitted, it is assumed to be 0, which means that the payments are made at the end of the period. 1 indicates that the payments are made at the beginning of the period.

	A5	▼	f_x	=FV(B1, B2, B3, 0,1)	
◢	A	B	C	D	E
1	rate	6%			
2	grooves	30			
3	rate	-1200			
4					
5	100,562.01 kn				
6					

Let us say for example, 30 years ago,you would pay 1200.00 per kn at the beginning of every year with an interest rate of 6% per year, at the end the value of investments will amount to 100 562.01 kn.

It is necessary to take into account whether the rate is expressed in months or years. Had it been a monthly repayment then it would be necessary to divide the interest rate by 12 and the formula will be =FV(B1/12, B2, B3, o, 1).

PV(rate; grooves; rate;[bv]; [type]) -> returns the current value of investments. The present value is the total amount of the present value of the stream of future cash expenses. For

example, when you borrow money, the loan amount is the present value of the person who lends you money. The arguments it receives are the same as for the function FV with the difference that it does not accept the argument sv but that means future value or cash balance you want to attain after the last payment. Bv can be omitted, but then there must be a statement about the amount of installment.

Suppose we have a data: money paid to the annuity insurance at the end of each month is 600 kn, the annual interest rate is 10% and the number of years in payments is 5. With the function =PV(E2/12,E3*12,E1,,0) to the present value of the annuity amount -28 239.22 kn. The result is negative because it represents the amount you need to pay, outlay. The first argument divided by 12 or the annual interest rate divided into the number of months of the years as it is done with monthly payment. The second argument is the number of years and it is multiplied by 12 to get the number of months of payments.

PMT(rate; grooves; pv; [fv]; [type]) -> a function to determine the rate of repayment of loans based on interest rates and periodic, constant repayment. Receives 5 arguments, of which the first 3 are required. Rate, grooves and type have the same meaning as in the previous 2 functions. Pv is the present value or principal. Fv is optional and represents the future value, if not speficied default value is 0.

If the annual interest rate is 7.5%, repayment may be made in the period of 2 years, current value is 5000 kn with the function =PMT(7.5%/12, 2*12, 5000, 0, 1) we would get installment of 223.60 kn.

Use functions for references and search: VLOOKUP, HLOOKUP.

VLOOKUP(value, columns_series, index, [incomplete matching]) -> this function performs vertical search or column search. As arguments receives the value at which it is searching, columns_series which are searched, index or number of the column from which it wants to get a return value, a value that is in the same row as the value which is transmitted. Incomplete matching is an optional argument that specifies whether to search an exact match (FALSE) or approximately (TRUE).

- If the index is less than 1 VLOOKUP returns #VALUE! (wrong)
- If the index is greateer than the number of columns specified in columns_series, the function returns #REF!
- If the optional parameters are specified as FALSE, and the function does not find an exact match then returns #N/A.

Let's say you have in column A the products codes, and in column B the products names. If you use the function =VLOOKUP(10, A1:B10, 2, FALSE) as the return value we get the name of the product with code 10.

HLOOKUP(value, columns_series, index, [incomplete matching]) -> works the same as VLOOKUP only works searching words.

Use function database: DSUM, DMIN, DMAX, DCOUNT, DAVERAGE

DSUM(data_base, field, criteria) -> add up the numbers in a field (column) in the list in the database that meet specific conditions. All 3 required arguments are mandatory, and they are: data_base, a range of cells that act as list or database, a field which is a column that is

used in the function, and the criterion range of cells that contains the conditions you specifiy.

Example: for the table below, if we use a function =DSUM(A4:D8,C4,A1:B2) we get 9 as a result , and the sum of the price per unit for all orders that have a serial number over 10 in which the amount is greater than or equal with 3.

Order number	Amount	Price per unit	Total price
>10	>=3		
Order number	Amount	Price per unit	Total price
5	1	2	2
6	2	3	6
11	4	4	16
12	5	5	25

DMIN(data_base, field, criteria) -> shows the lowest number in the field (column) records in a list or database that meets certain requirements. The received arguments are the same as function DSUM. In the above table we will use =DMIN(A4:D8,C4,A1:B2) as a result we get 4 as a result, the lowest cost per unit.

DMAX(data_base, field, criteria) -> Shows the highest number in the field (column) records in a list or database that meets certain criteria. All of the above applies to DSUM and DMIN. If over the above table we use =DMAX(A4:D8,C4,A1:B2) we get as a result 5, or the highest price per unit.

DCOUNT (data_base, field, criteria) -> The number of cells that contain numbers in a field (column) records in a list or database that meet certain conditions. And it is worth all of the above for the earlier functions using =DCOUNT(A4:D8,C4,A1:B2) will return 2, if 2 cells correspond to the criteria.

DAVERAGE (data_base, field, criteria)-> Determines the average value of the field (column) recorded in a list or database that meet certain conditions. And it's worth all the previously mentioned and using =DAVERAGE(A4:D8,C4,A1:B2) will return 4.5 if shared the returned with DSUM with was returned DCOUNT in this case.

Use level nested function

Sometimes we need to use a function as an argument that is passed to another function. This is called nesting. Excel supports up to 64 levels of nesting.
When Function B is used as an argument of Function A, Function B is a function of the second level. An example of level nested function would be = ROUND(SUM (D1 : D3), 2). There, function ROUND receives as a first argument which returns SUM function.

Use 3-D references in the function sum

3-D references allow us to simultaneously referingthe cells in multiple worksheets.
=SUM(List2:List13!B5) -> returns the sum of all the values contained in cell B5 on all the worksheets between 2 and 13, including the 2 lists.
=SUM(List1:List10!A1:C3) -> returns the sum of all values in the cell range A1:C3 on all the worksheets between 1 and 10, including the 2 lists.

Use mixed references in formulas

Mixed references allow us to combine the one absolute and one relative label whether it is a column label or a tag line. The reference are the ones that will change if the cell with the formula copy to another respective location. These are defined only with marked column and row (eg. A1, B3). Absolute references are the ones that when copying or moving formulas are always done with reference to the same cell.It shall be marked so that in addition to the label of the column and now referenced formula puts a dollar sign ($) (eg. A1).

We have 2 flavors of mixed references:

- Absolute column – relative line. An example of such references is $A3. With these references the $ prefix is in front of the letters indicating the column. If the formula with this reference $A3y is changing the cell in which the formula will be changed only by address line. If we have a formula in which we use the above reference $A3 copy one line below and one column to the right of the one containing the original formula, the reference will change to $A4.

- Relative column – absolute line. An example of such references is A$2. In this case, copying the formula changes addressed column address while the line remains the same.

3.   CHARTS

3.1   CREATING CHARTS

Create a combined line-bar chart

In the table first check all the data you want to display in the chart. (for this example it will be marked with a whole table).

Success	Mathematics	Croatian	History
Excellent	5	6	8
Very good	7	7	10
Good	10	8	4
Sufficient	5	5	4
Insufficient	3	4	4

After that from the card **Insert -> Graphs** choose a bar graph as desired / required.
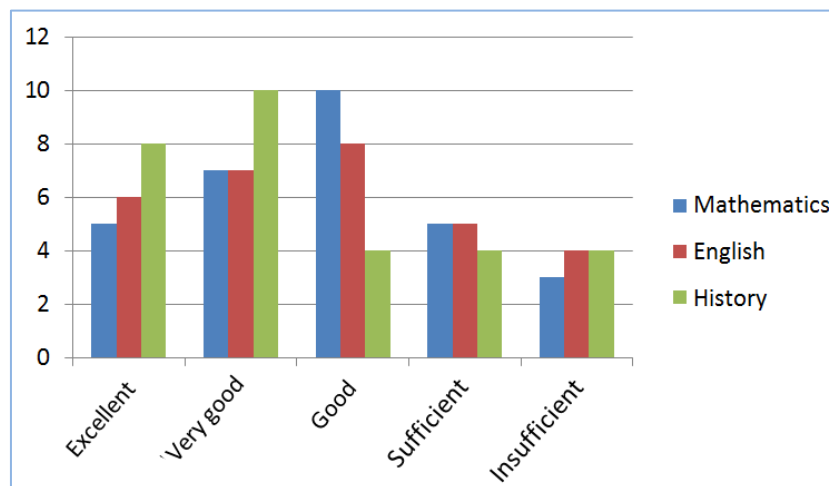
Now we have a chart that shows the columns score for all 3 cases. The results from mathematics display a line necessary to point to the set of mathematics on the right side of the chart.
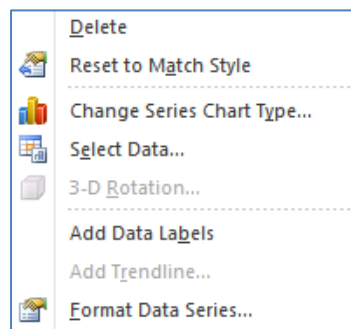
It will appear among the options and the ability **To change the chart type for a collection**. Select this option and choose a chart of the available line. This will result in the data for

mathematics now displayed in a line chart, while others will continue to be displayed columns.
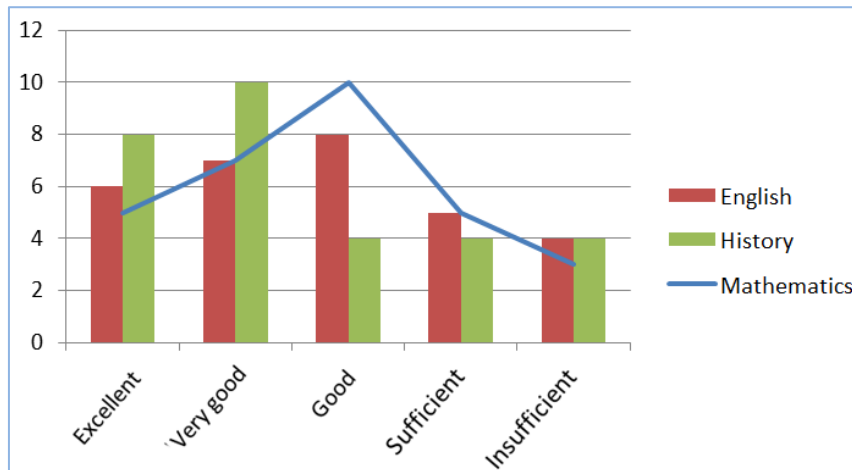
Add a secondary axis to a chart

It is possible to add a secondary vertical and horizontal axis. To add a secondary vertical axis we shall use the table in the previous example. Highlight the table and select the bar graph.
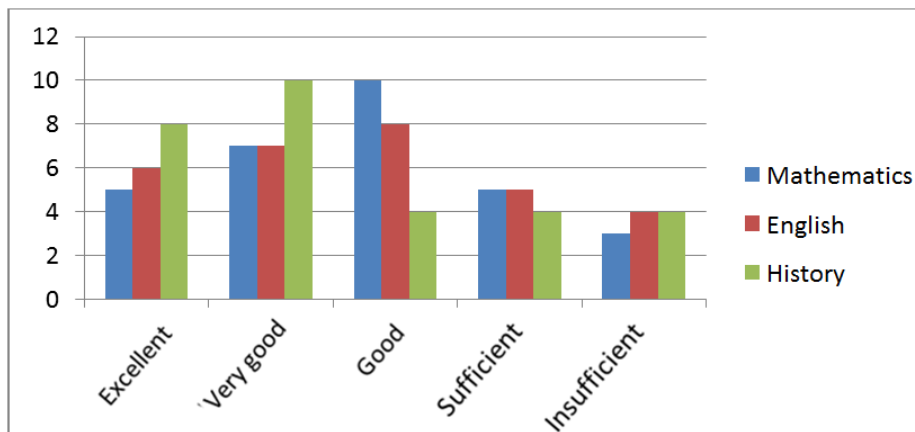
For the data from the English, viewed on the secondary axis, it is necessary to mark this data set (as in the previous example) and then select option **Formatting data sets**. When the menu opens under option **Options strings** mark **Secondary axis** (located on the bottom of the list).
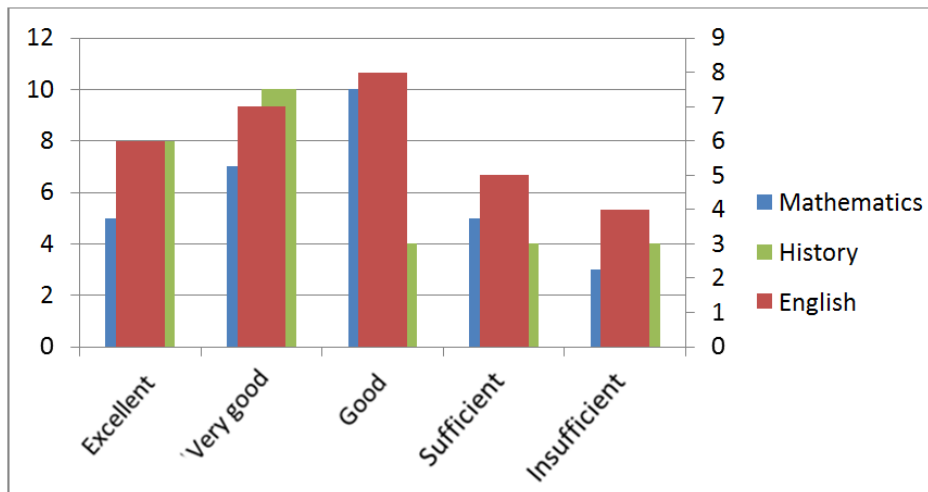
As a result of these operations on the right appeared a secondary axis which is associated with grades in English, while the axis of the left side is associated with estimates from other 2 cases.

To add a secondary horizontal axis you must have already added the secondary vertical axis. Then click on the chart that shows the secondary vertical axis. It will show the **Chart tools** with optional cards Design, Layout and Shaping. **Layout -> Axes -> Secondary Horizontal Axis** and then select the desired display option.
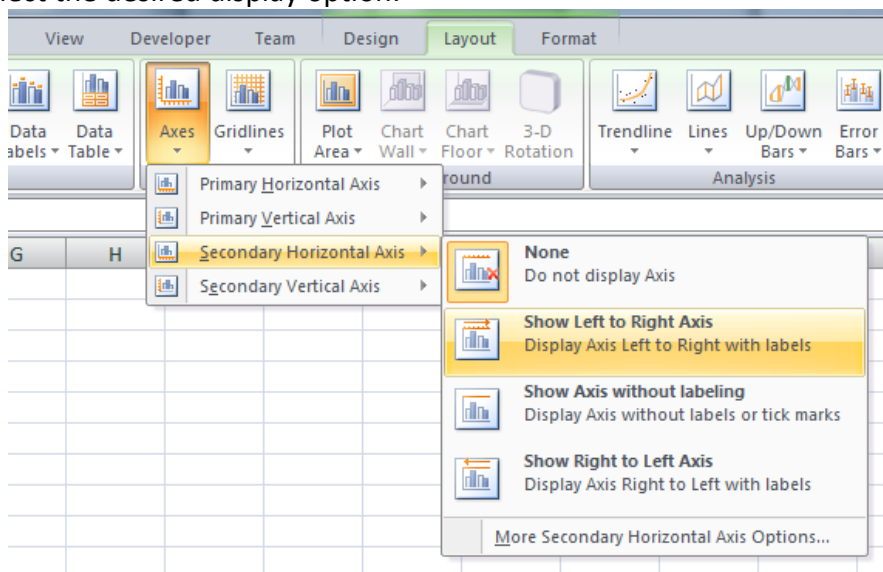
Change the chart type for a defined data series

The process comes down to the steps that you used when creating a combined line-bar chart. So it is necessary to mark the desired range of data. It will appear **Chart tools** with optional cards Design, Layout and Shaping. **Design -> Type -> Change the chart** and select the chart you want. The same can be achieved if you right-click on the selected string, select **Change the chart for collection**.

Add, delete a data series in the chart

To add / delete a data series in the chart it is necessary to select a chart and then go to **Tools for graphs -> Design -> Information -> Select the data**. If necessary, choose **Add** or **Remove**.
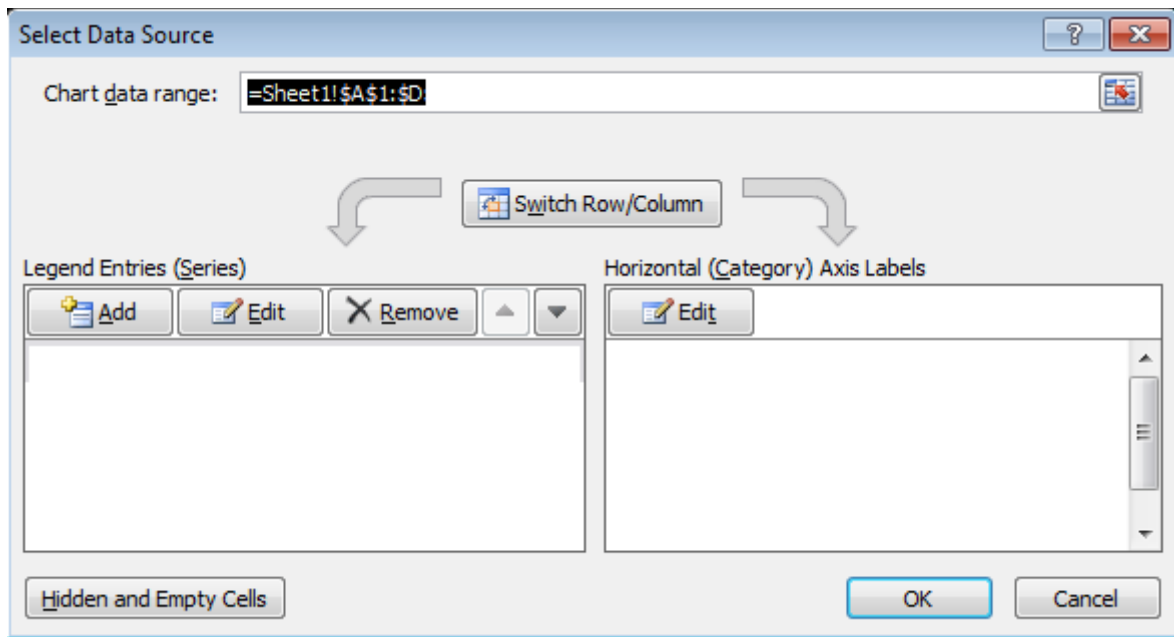
3.2 DESIGN OF FIGURES

Change the position of the chart title, legend, data title

In order to fulfill the above changes you need to select a chart and then in **Tools chart -> Labels** choose the desired subcategory.
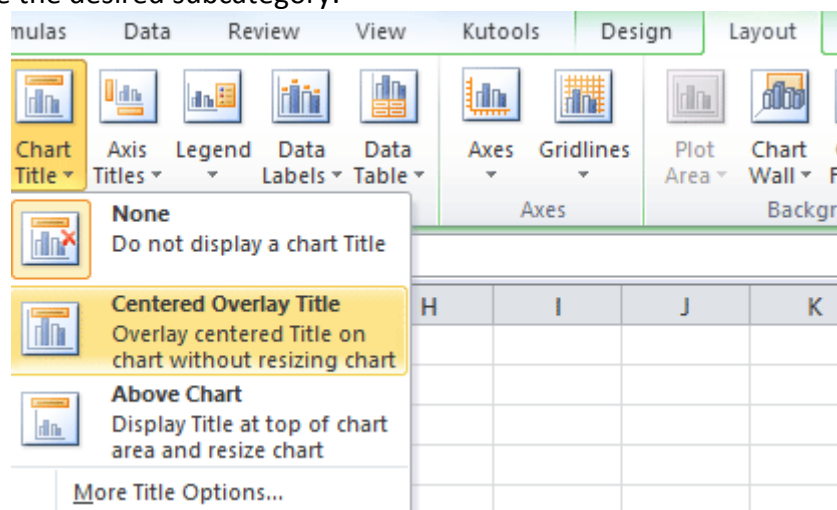
Change the value axis: minimum, maximum number to display, major interval

Indicate the desired axis then right-click with the mouse. Select the **Formatting axis**.
In the menu that appears, select **Axis options**. If you enter the data shown in the figure you get axis showing value from 0 to 15 with the interval of 5 (ie 0, 5, 10, 15).
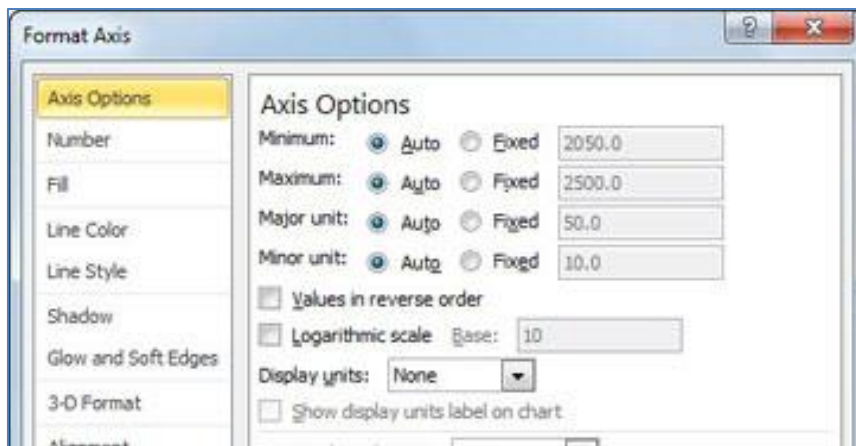
Change display units on axis value without changing data source: hundreds, thousands, millions
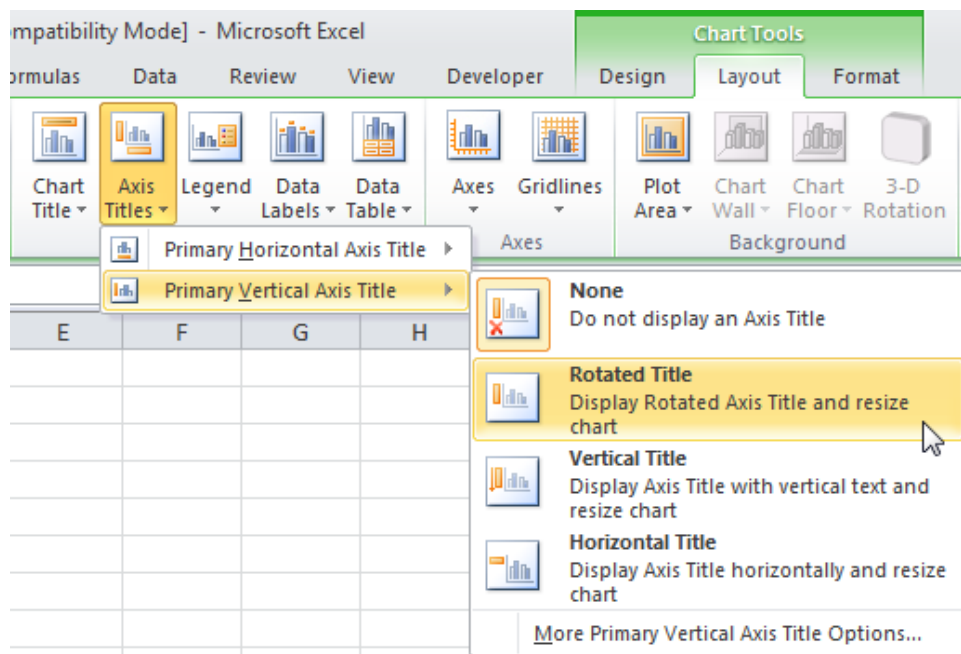
Format columns, bars, plot area, chart area to display an image

For the design of any portion of the chart within a chart, it is enough to mark the desired element and when appears additional **Toolbars for charts** on the card **Form** click on **Format** in the category **Current selection**.

4. ANALYSIS

4.1 USE OF TABLES

Create, modify a pivot table/datapilot

Pivot table is a special type of table that allows easy compression, analyzing and presenting data.

To create a <u>pivot table</u> the steps are:

- Click anywhere in the table you want to create a pivot table. Make sure that the table has no blank rows or columns, so that each column has a header.
- **Go to Insert -> Table -> Pivot tables**
- Automatically a dialog box opens up and it will already be marked with the whole table. Set the basic settings as desired/required.
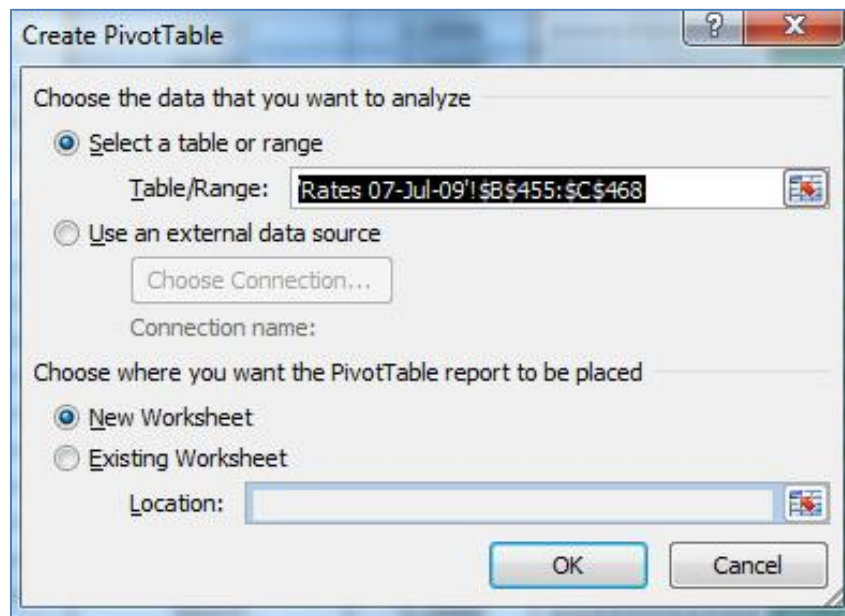
- The next step is to select which data is to be displayed in a pivot table. In the upper part of the **PivotTable Field List** select data (columns) you want to include in the report. In the lower part of the field it'll classify into 4 categories:
    - Filter reports: this section contains fields that allow you to filter the data in the table.
    - Inscription columns: this section contains fields that define the layout of data displayed in columns in the table.
    - Inscription lines: this part contains fields that determine the distribution of the data presented in rows in the table.
    - Value: this part contains fields that determine what data are shown in the cells of pivot table – values that are added in the last column.
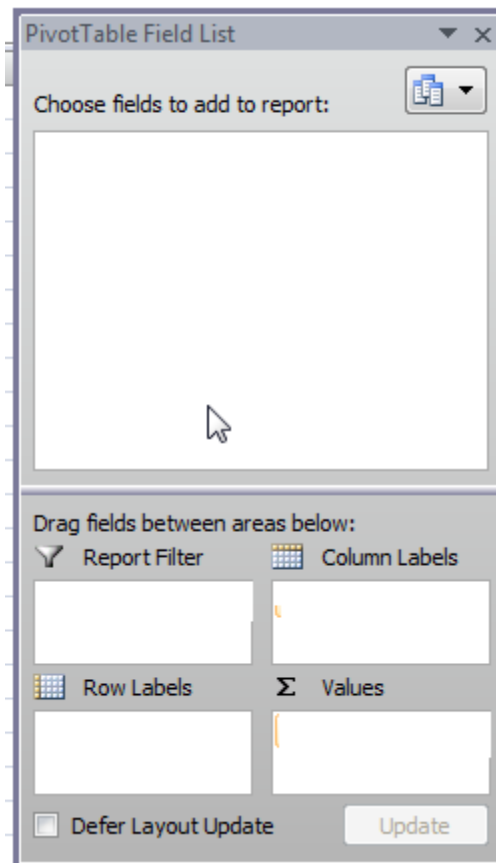
- If we were to create in the following table a pivot table in which the data were presented in a way that is grouped by events in a particular case as a result we get a table as shown below:

Student	Competition	Points
Ana	Mathematics	45
Pero	English	47
Filip	French	38
Jelena	History	42
Petar	Mathematics	35
Marina	English	45
Hrvoje	French	28
Martina	History	48

Row labels	Sum of Points
⊟French	66
Filip	38
Hrvoje	28
⊟English	92
Marina	45
Pero	47
⊟Mathematics	80
Ana	45
Petar	35
⊟History	90
Jelena	42
Martina	48
Total sum	328

PivotTable Field List

Choose fields to add to report:

- ☑ Student
- ☑ Competition
- ☑ Points

Drag fields between areas below:

Y Report Filter   Column Labels

Row Labels   Σ Values

Competition ▾   Sum of Points ▾
Student ▾

☐ Defer Layout Update   Update

Select the other options to see how it changes the display depending on selected files.
For smaller tables Pivot table may not be of much use, but if we have data like say 1000 students and 10 different items then this is a quick and easy way to get an overview of all points.

For datapilot table the procedure is similar, except that when you create it you don't choose how it will be moving columns/rows in the table but that logic will be shown in the chart
- Click anywhere in the table you want to work datapilot.
- **Insert -> Table -> Datapilot**
- If you have already made the pivot table out of it, you can easily get datapilot by clicking inside it and then go to Insert -> Graphics and choose a chart of your choice.

For the above example, the chart would look like:

Sum of Points

Chart Area

Sum

	Filip	Hrvoje	Marina	Pero	Ana	Petar	Jelena	Martina
	French		English		Mathematics		History	

■ Sum

Competition ▾ Student ▾
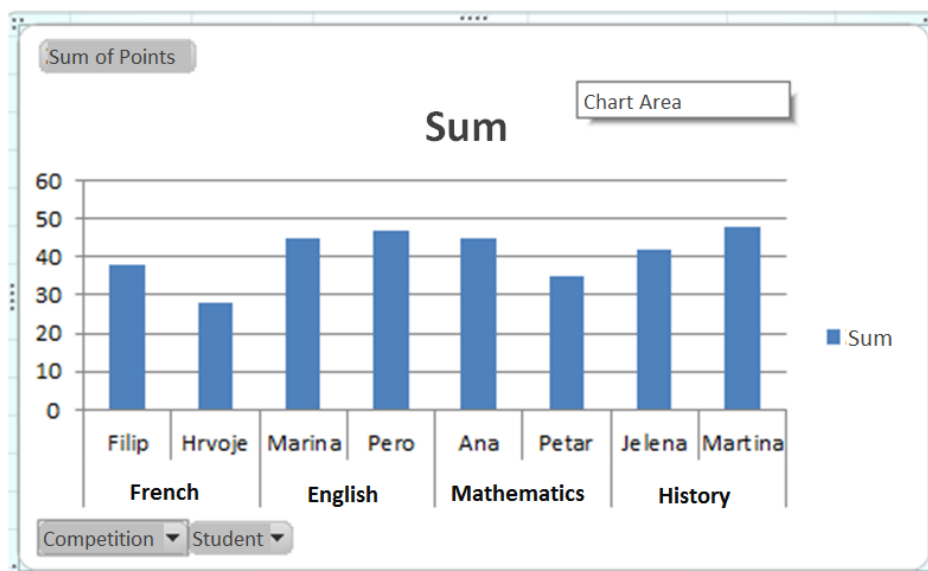
Datapilot is a convenient way of data visual presentation, which also allows data filtering and viewing graphical relations.

Modify the data source and refresh the pivot table/datapilot

Mark the table/graph and when appears a card with **PivotTable** choose **Update/Change data source** for necessary modification**.**
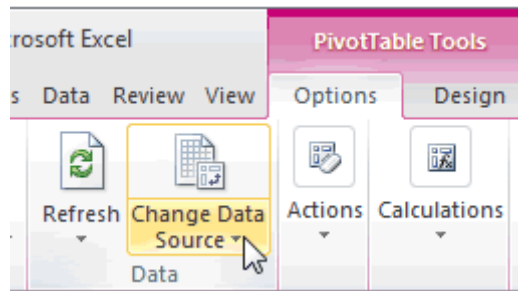
Filter, sort the data in a pivot table / swivel chart

Mark the table/graph and from **PivotTable Tools** choose **Filter/Sort**. The operations can be done directly from the table/graph by clicking the down arrow that indicates a drop down menu.
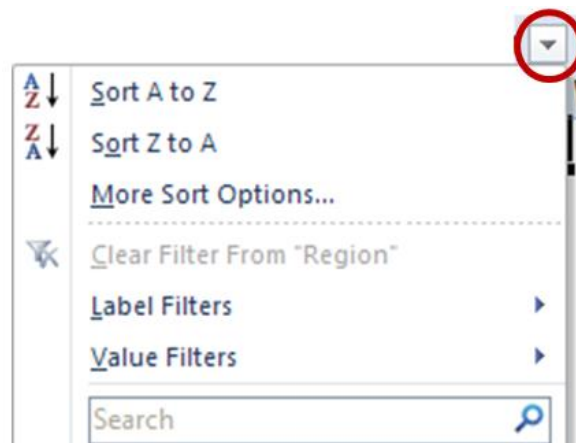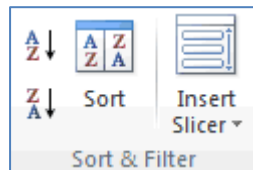
Automatically, manually group data in a pivot table / chart and rename groups

Let's say you previously created a pivot table which you want to modify in a way to make the 2 groups depending on the decision whether the event was in April or May. Highlight the desired items, and then click on **Group selection** which is located in the **PivotTable Tools -> Options -> Group.**

If we grouped the first 2 cases and the other 2 results should look as follows:

E	F
Row labels	Sum of Points
⊞ French	66
⊞ English	92
⊞ Mathemathcs	80
⊞ History	90
Total sum	328

Names of Group1 and Group2 are automatically created, in order to modify, it is necessary to select the cell and change the name in the formula bar.

E	F
Row labels	Sum of Points
⊟ Group1	
⊞ French	66
⊞ English	92
⊟ Group2	
⊞ Mathemathcs	80
⊞ History	90
Total sum	328

f_x	April				
C	D	E	F	G
Points		Row labels	Sum of Points	
45		April		
47		⊞ French	66	
38		⊞ English	92	
42		⊟ Grupa2		

Use the table with one or two inputs / multiple operations

Tables with input variables fall under **What if analysis**, or under **Datasheets**. Datasheet is a certain range of cells that shows how changing of one or two variables in a formula affect the result of the formula.

Table with one input -> to make it easier to understand what it is, using the table with one input will be shown through example.

B5		▼ ⊙		*fx*	=B1*(1+B2)^B3
	A	B	C	D	
1	Principal	5000			
2	Interest rate	7.50%			
3	Number of years	5			
4					
5	Amount	7178.147			

The table shows how to get the amount you'd deposited of 5000 kn for 5 years at an interest rate of 7,5%. If you would like to check if the amount varies depending on the interest rate, we could in cell B2 enter different interest rate and watch the result. However, this can be achieved in a faster way.

	A	B
1	Principal	5000
2	Interest rate	7.50%
3	Number of years	5
4		
5	Amount	7178.147
6		6%
7		7%
8		8%
9		9%
10		10%

In cells A6:A10 are inserted different interest rates. After that, you must mark the field as made in the image. Go to card **Data-> Data Tools -> What if analysis -> Data table**. It will appear a dialog box in which to enter a reference to cell B2 (due to the track changes in interest rates).

What-If Analysis ▾

Scenario Manager...
Goal Seek...
Data Table...

Group

Data Table

Row input cell:

Column input cell: B2

OK   Cancel
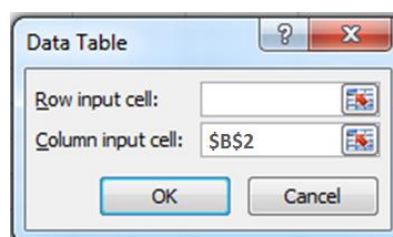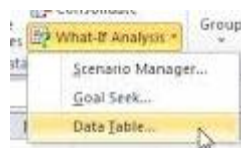
Enter the value in the cell of the column because the data is displayed in the column. If you want the result of the operation displayed in the line then enter a value in a cell line. The result is a table in which you now have different values depending on different interest rates.

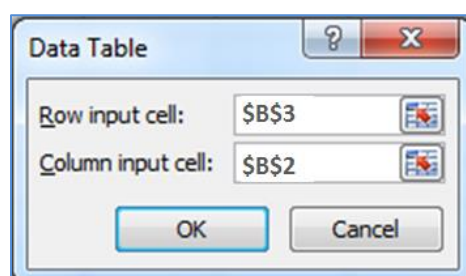| B10			f_x {=
	A	B	C
1	Principal	5000	
2	Interest rate	7.50%	
3	Number of years	5	
4			
5	Amount	7178.147	
6		6% 6691.128	
7		7% 7012.759	
8		8% 7346.64	
9		9% 7693.12	
10		10% 8052.55	
11			

The principle is the following: the value from cells A6:A10 are forwarded to the formula in cell B5 and with the appropriate result the cell B6:B10 is fully charged.

Table with two input variables will be shown also through an example. The difference compared to the table with one input which is now looking at the results of the change of two variables. We use a table of the previous example with some changes.

A5			f_x =B1*(1+B2)^B3			
	A	B	C	D	E	F
1	Principal	5000				
2	Interest rate	7.50%				
3	Number of years	5				
4						
5	7178.146631	1	2	3	4	5
6	6%					
7	7%					
8	8%					
9	9%					
10	10%					

In this case, we will swap value of interest rate and years to see different results.
Select cell A5:F10 and again choose **Data -> Data Tools -> What if analysis -> Data table.** In the dialog box we are filling now both fields, as we monitor the results by the columns and the rows. In the columns we monitor the changes in interest rates and we follow the changes per year.

Data Table		? X
Row input cell:	B3	
Column input cell:	B2	
	OK	Cancel

The result we get is:

	A	B	C	D	E	F
	A5	▼	f_x =B1*(1+B2)^B3			
1	Principal	5000				
2	Interest rate	7.50%				
3	Number of years	5				
4						
5	7178.146631	1	2	3	4	5
6	6%	5300	5618	5955.08	6312.385	6691.128
7	7%	5350	5724.5	6125.215	6553.98	7012.759
8	8%	5400	5832	6298.56	6802.445	7346.64
9	9%	5450	5940.5	6475.145	7057.908	7693.12
10	10%	5500	6050	6655	7320.5	8052.55

In this case the value of B5:F5 is inserted into the formula instead of B3 and a value A6:A10 is inserted in location B2.

4.2 SORTING AND FILTERING

Sort data by multiple columns at the same time

First, select a range of cells with 2 or more columns. Then on the tab go to **Data-> Sort and filter -> Sort**. then a dialog box **Sorting** will appear.
Select the first column in which the applicant wishes to sort and choose according to what it wants to carry out sorting and in what order.
In order to add another column to sort, click **Add level** and repeat the procedure as for the first column.
In the table we used for examplifying pivot tables, if we want to sort by competition and by points it would look like the following figure:

The result would be a table:

Student	Competition	Points
Ana	French	28
Pero	French	38
Filip	English	45
Jelena	English n	47
Petar	Mathematics	35
Marina	Mathematics	45
Hrvoje	History	42
Martina	History	48

Create a customized list and perform a custom sort

Custom lists are used for sorting by user-defined order. To create a custom listf the steps are as follows.
In the range of cells, enter the values that you want to sort, in the order of preference, from top to bottom. Eg.

	A
1	High
2	Medium
3	Low

Select the range that you entered (in this case A1:A3). Go to **Files -> Options -> Advanced -> General -> Edit custom lists -> Import** and click **OK**.

On the worksheet, highlight the column you want to sort and click **Sort**. In the dialog box that appears, select **Custom list** and then select the list you have just created. The following illustration shows the column before and after sorting.

medium	high
low	medium
high	medium
medium	low
low	low
low	low

Automatic filter

For example, we will use the following table.

Student	Mathematics	English	Results
Ana	85	87	satisfactory
Filip	50	77	satisfactory
Janko	72	22	not satisfactory
Mirjana	24	12	not satisfactory

To enable the filter,it is sufficient to mark any cell in the table and then choose **Filter** from the **Data card**.

Arrows appear automatically down in the header of each column.

I	J	K	L
Student ▼	Mathematics ▼	English ▼	Result ▼
Ana	85	87	satisfactory
Filip	50	77	satisfactory
Janko	72	22	not satisfactory
Mirjana	24	12	not satisfactory

If we want to filter the only students with satisfactory results, you need to click on the arrow in the column Result and select the menu option "satisfactory".

As a result we get a table in which are hidden all the data that do not correspond to a given filtering condition.

Student	Mathematics	English	Result
Ana	85	87	satisfactory
Filip	50	77	satisfactory

### Change the advanced filter options in the list

When using the advanced filter, the arrow drop-down menu does not appear, instead we need to enter the criteria in the range of criteria.

, for example,if we want to see only students who have more than 50 points in mathematics, then is should be defined as follows:

Mathematics	Mathematics
>50	<100

We mark a table in which we want to filter, and then on the tab go to **Data -> Advanced Sorting and Filtering**.

There will appear the dialog box in which we bring our criteria, or in this case in the range of criteria we import table with conditions that we just defined, and then click **OK**.
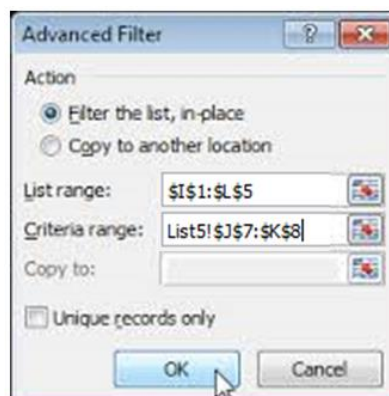
The result will be a table in which the only students who meet the defined criteria will be shown.

Student	Mathematics	English	Results
Ana	85	87	satisfactory
Janko	72	22	not satisfactory

Use an automatic calculation of subtotals

Select the cell range, sort them first, and then **Data -> Structure -> Subtotal**. It will open then a dialog box as shown below in which you define what you want to monitor and count.
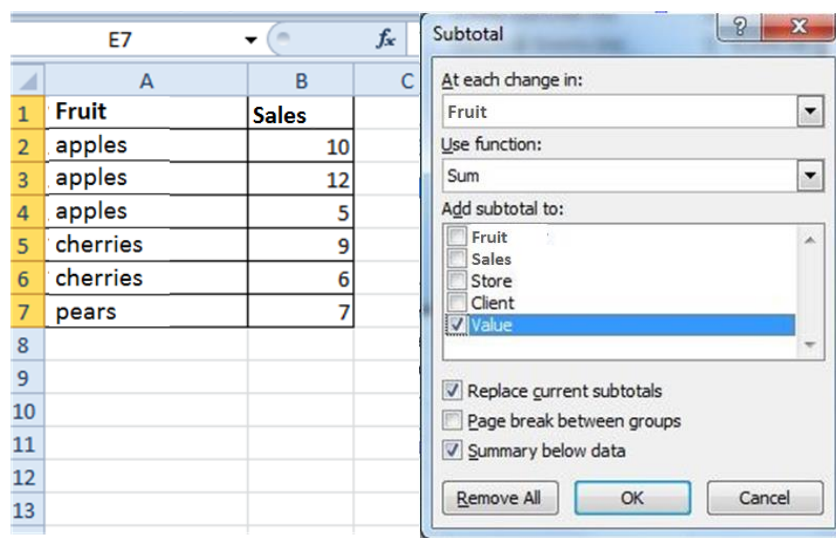
The following figure shows the result for the selected item:

4.3 SCENARIOS

The scenario is a set of values that Excel saves and can automatically replace the cells in the worksheet. On the worksheet, you can open and save different groups of values and then switch to any of these new scenarios to see different results.

Create scenario

Creating a scenario will be shown in the following table:

	A	B
1	Budget 2014	Marketing
2		
3	Revenues	50000
4	Expenses	20000
5		
6	Profit	=revenues-expenses

Workbook wipes all the leaves except for the first and give it the name Budget

Enter the values as shown in the figure. Name the cells (not mandatory, but is also easier to manage scenario). Cell B1= department, B3=income, B4=expenditure, B6=profit. In cell B6 enter the formula =revenue- expenditure.

Go to **Data -> >Tools Data ->What if analysis? -> Managing scenarios**. On it click **Add...** Enter the name of the Scenario, eg. Marketing. Under the changing cells select B1, B3, B4. Click **OK**. This will open a dialog box **Scenario value**. There you can change the values, for this example we will keep those that have been entered when creating the table so just click OK to return to the dialog manager scenarios and click Close to return to the worksheet.

View, edit, delete scenarios

To view scenarios, click on **What if analysis?** and with a list choose a scenario to display. In the same way, the scenario can be deleted by selecting **Delete**. To change select **Edit.**

Create a scenario summary report

Click on **What if analysis? -> Managing Scenarios -> Summary**.

The following figure shows the result that would be obtained if there is added another Scenario with different values. In this way we can easily compare different Scenarios.

A	B	C	D	E	F	G

Scenario summary						
	Current value:			Marketing	Marketing2	
Cells that change						
Department		Marketing	Marketing	Marketing		
revenues		50000	50000	40000		
expenses		20000	20000	10000		
Cells with results						
profit		30000	30000	30000		

Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

## 5.	EVALUATION AND SUPERVISION

### 5.1	EVALUATION

Set, edit validation criteria for data entry into a range of cells such as integer, decimal, list, date and time

For data evaluation the following steps are required:

- Select the desired range of cells
- Click on **Data-> Data Tools -> Data validation -> Preferences**. In the settings, then select the desired value.

Enter input message and the error message

To enter an incoming message we need to follow the steps as in the previous instructions, and then click on the **Incoming message**, enter the message in accordance with the criteria of evaluation. This message will appear when you highlight a cell for which is criteria defined.

To enter a warning error follow the same steps as in the previous instructions, then click on **Error warning** and enter the requested information. This message will be displayed when you enter a value that does not meet the criteria.

### 5.2	SUPERVISION

Subscribe precedent, dependent cells. Tracking errors.

Formulas in Excel can contain predecessors and can serve as a dependent on other formulas. Cells often serves as previous and as a dependent.
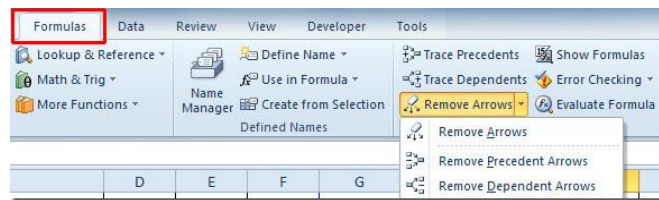
	A	B	C	D	E
1	Branch	Actual sales			
2	Zagreb	50000			
3	Split	20000			
4	Dubrovnik	33000			
5	Osijek	21000			
6	Rijeka	36000			
7	Zadar	18000			
8	Total sales	=SUM(B2:B7)			
9				Profit	=B8-B17
10	Branch	Costs			
11	Zagreb	7000			
12	Split	2000			
13	Dubrovnik	4000			
14	Osijek	3000			
15	Rijeka	5000			
16	Zadar	1000			
17	Total costs	=SUM(B11:B16)			

Note the following: cells B2:B7 are previous to cell B8, and at the same time cell B8 is dependent on cells B2:B7. The same goes for cell B17 i E9, provided that E9 is not anybody's previous.
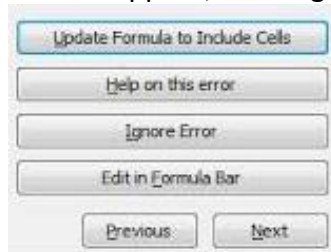
The following figure shows the same worksheet, but with dependency.

	A	B	C	D	E
1	Branch	Actual sales			
2	Zagreb	50000			
3	Split	20000			
4	Dubrovnik	33000			
5	Osijek	21000			
6	Rijeka	36000			
7	Zadar	18000			
8	Total sales	=SUM(B2:B7)			
9				Profit	=B8-B17
10	Branch	Costs			
11	Zagreb	7000			
12	Split	2000			
13	Dubrovnik	4000			
14	Osijek	3000			
15	Rijeka	5000			
16	Zadar	1000			
17	Ukupni troškovi	=SUM(B11:B16)			

Previous and dependent cells are obtained by selecting the cells we want to check, for the previous and the dependent cells and it is necessary to choose **Formula -> Control formula -> Trace Precedents** or **Formula -> Control formula -> Trace dependents**. To remove the arrows use **Formula -> Control formula -> Remove arrows.**

Tracking errors -> if in B8 you replace B2 with B3, monitoring will automatically disappear and the monitoring and predecessors will appear, warning about a possible error.

You can check errors using **Formula -> Control formula -> Error checking** and then opens a dialog box through which you can continue to handle errors.
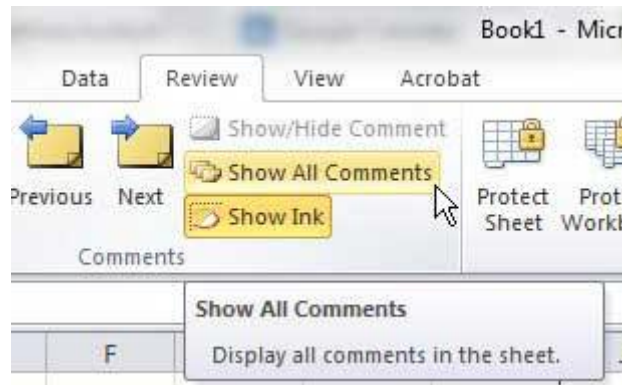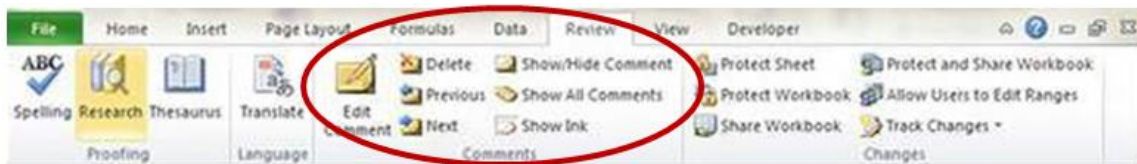

Show all formulas in a worksheet, rather than the value of the results

Formula -> Control Formula -> Show formula

Insert, edit, delete, show, hide comments/notes

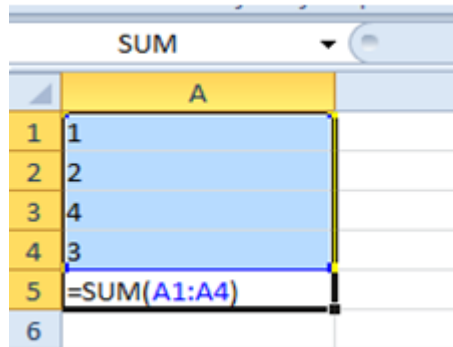Everything needed for these actions is in **View -> Comments.**

6.   IMPROVE PRODUCTIVITY

6.1   CELLS APPOINTMENT

Appoint cell ranges, delete names for cell ranges

It is necessary to select a cell or range of cell which is desired to provide a name, and then click the Name box located on the left edge of the strip formula. Enter the desired name and then click ENTER.

Another option is to define the title over the card **Formula -> Defined names -> Managing names.** Over managing is the name which you can delete.

Use named cell ranges in functions

We are using named ranges in functions in a simple way, which is that instead of the function name a range of cells to name names. In the following example, the cells containing the amounts are named Quantity, so in the formula to summarize the range of cells insert just the name of Quantity.
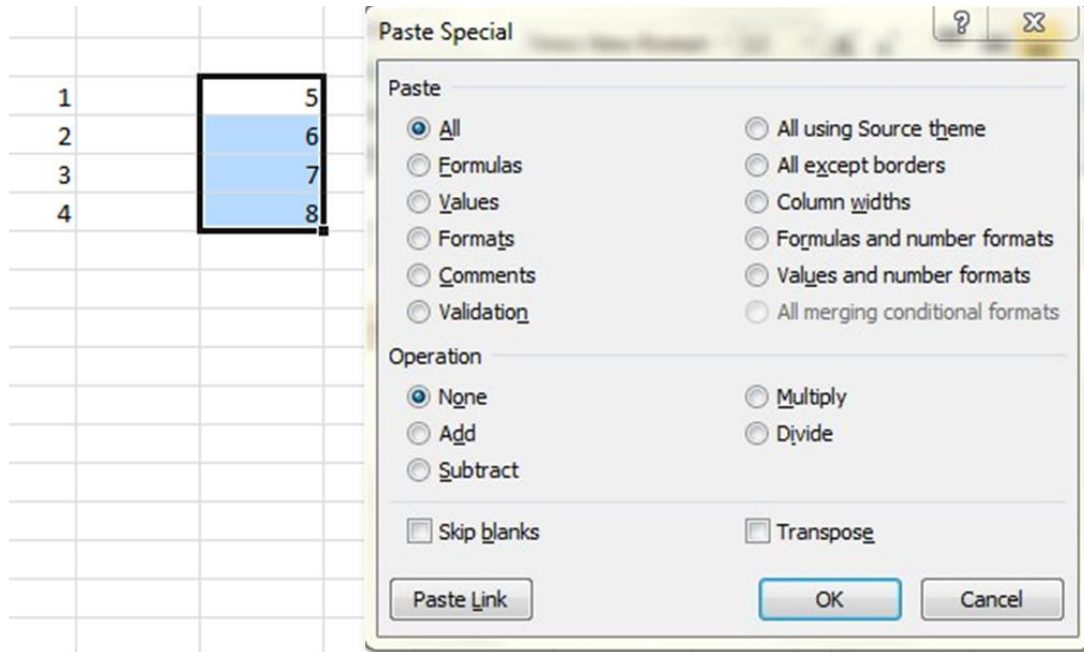

6.2   PASTE SPECIAL

Use the paste special options: add, subtract, multiply, divide

With the help of the dialog box **Paste special,** complex items can be copied from the worksheet of the program Microsoft Office Excel and pasted into the same or another Excel worksheet using certain attributes of the copied data or mathematical operations you want to apply to the copied data.

For example in one column, we have value 1,2,3,4. We mark these values and click on **Copy** ,Then mark the column with the values 5,6,7,8 and with a right-click we open up the menu

with the options among which is the **Paste special** (to Paste special we can get through the main menu **Home -> Paste-> Paste special**). In the Paste special select the desired operation, eg. Paste all and Procedure add up. Once you click on OK in the second column we get aggregated value from the first and second columns. In the same way we achieve other operations.

Use the Paste special options: values/numbers, transpose
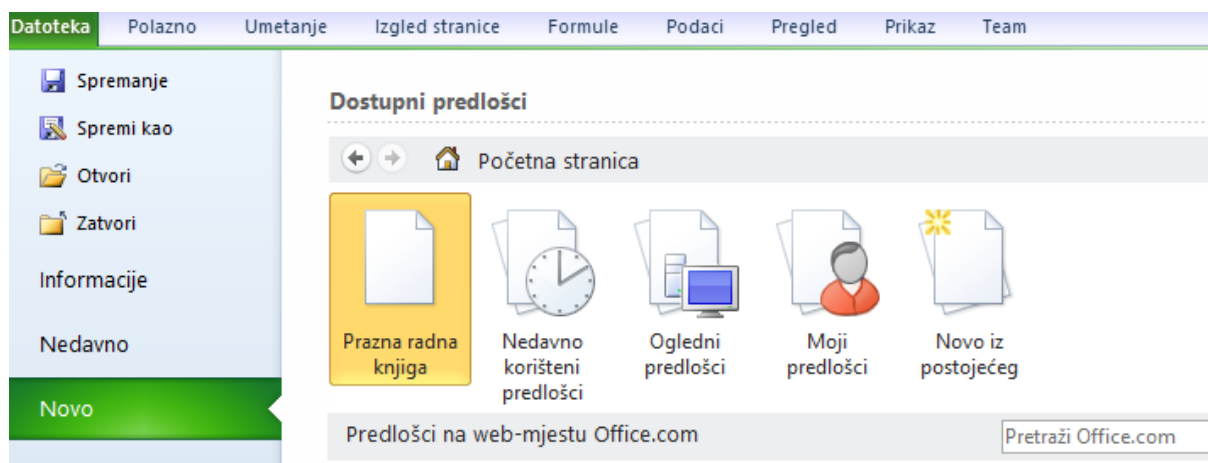
Steps for all of the options are the same as the previous.

- Value- Paste only the value of the copied data as they are shown in the cells.
- Transpose- If you select this option, columns of the copied data changes to rows and vice versa.

6.3 TEMPLATES

**Make a workbook based on an existing template**

Click on **File -> New -> Available templates**

Select **Sample templates**, or **My templates** (if you have previously stored) and select the desired template and double-click on it.

Modify template

With templates you can make changes you desire. Some templates protect changing list which you can enable via **View -> Changes -> Unprotect Sheet**.
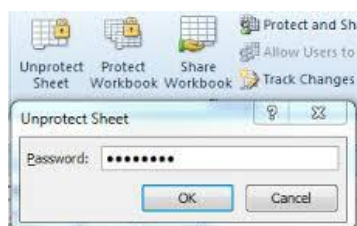
To amend the modified template as a template, it is necesserary to choose when saving **Save as -> Template Excel (.xltx).**

## 6.4 CONNECT, IMPORT AND EXPORT

Edit, insert, remove a hyperlink

Hyperlink is a connection from the document that opens another page or file when you click it. Connection can be done with the existing file or web page placed in the current document, a new one or e-mail address.

- Creating a hyperlink to an existing file or web page:

On the worksheet, highlight the cell in which you want to create a hyperlink. **Insert -> Connections -> Hyperlink**. Under **Connection** click **Existing file** or **web-page**. In the menu then you can select a file or web page you want to connect to. While you are in the menu, you can define **Text do display** and the name under which it will display a hyperlink in a cell.

If you create a link to the www.google.com and define the **Text to dispaly** as Google at the end, it should eventually look like this:

Google

Google
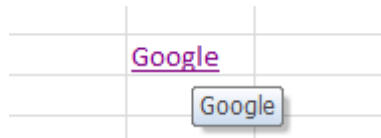
Edit the hyperlink so that you can highlight a cell in which there is a hyperlink and right click with the mouse. Among the options **Edit hyperlink** will appear**.** The same applies to the removal of a hyperlink.

Link data in the workbook, between spreadsheets, between applications

Linking data allows the changes made in one to affect the other place where we keep the same information. For example, while connecting a data within a spreadsheet, if we change the value of the first worksheet cell A1, it will change to another worksheet that contains a link to the first worksheet, especially in that cell.

The steps to connect are:

Mark the desired cell in the source worksheet (if you work linking between workbooks ensure that both workbooks are open and that all changes are saved) and select **Copy.**

In the destination worksheet higlight the cell in which you want to copy the data, press the click-right between **Bonding options** choose **Paste links**.
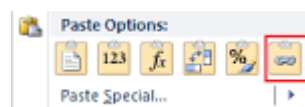
When you click on the cell, you've connected to the source cell in the formula bar to include a reference to the cell with which the marked cells are connected.
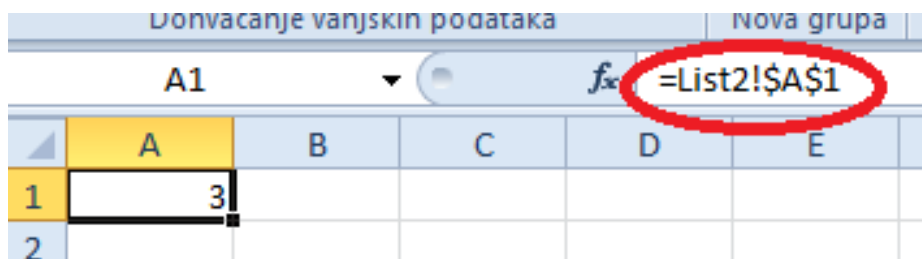
Connectivity between applications is done in the same way. We mark the table, select **Copy** and in a text document, choose **Paste special**.
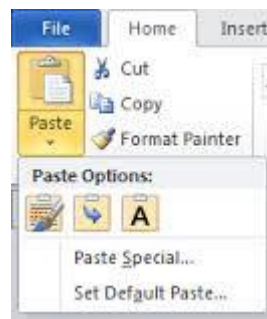
It'll open a dialog box in which you can choose **Paste link**:

After all the changes you make to the worksheet it will automatically copy in a Word document.

Import delimited data from a text file

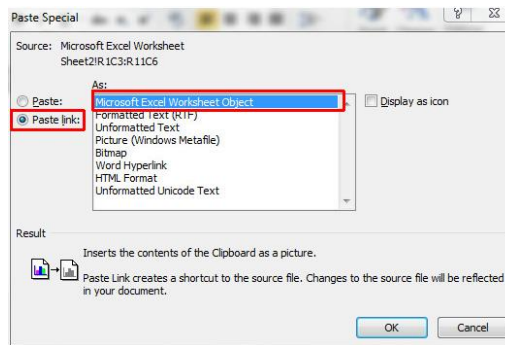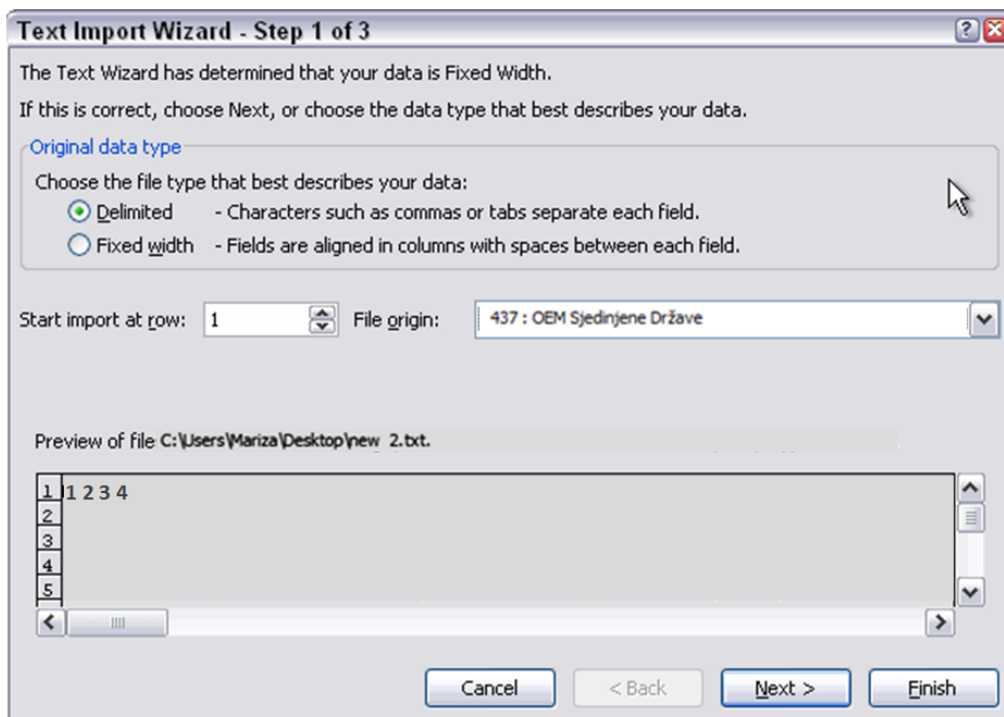Delimited text files (.txt) are those in which all text fields usally delimit tab. You can import the data from these files with the following steps:

Click the cell where you want to place the data from text files, then go to **Data -> Get external data -> From the text.**

Find the text file you want to import and then follow the wizard to import text

6.5 AUTOMATION

Create macros such as change page setup, apply a custom number format, apply the automatic formatting to a cell range, insert fields in the header, footer worksheet

Macros allow you to record specific steps that can then be made by simply moving macros. For example, if we have to add fields in the header/footer on each worksheet, they won't do that every time again for each sheet,they do it on a sheet, record and then just move on to other lists.

The commands that are used to work with macros are in the group **Code** on the tab **Developer** which is hidden by default. To display it, go to the **File -> Options -> Customizing the ribbon**. In the list select **General tab** then click on **Developer -> Add-> OK**.

To record a macro go to **Development -> Code ->Save macro**. This will open a dialog box **Recording macros** in which you enter the data of your choice. When you click **OK** it starts shooting, and all action performed will be recorded. When finished with the desired actions, click the **Stop recording** (it will appear on the spot Record macro).

Run a macro

Go to the tab **Development -> Code -> Macros**. This will open a dialog box **Macros** from which you select the macro you want to run and click **Run.**

Assign a macro to a button in the toolbar

Select **File -> Options -> Toolbar for quick access**. From the list **Select commands** choose **Macros**. In the list, click the macro that you created and then click on **Add**. To change the image of macros button, select the macro within which you add it and then click Modify. Under Symbol click the image button you want to use. Click OK.

7.   COLLABORATIVE EDITING

7.1   TRACKING AND REVIEWING

Turn off, track off changes. Tracking changes in a worksheet using the preview pane.

View -> Changes -> Shared using workbook. In the dialog box label **Allow concurrent changes by multiple users**. In the tab **Advanced** you can select how long you want to keep the message in history, how often to update the changes and similarly when you set all the parameters, click OK. After that you will be told that it is necessary to save the workbook and so you do it.

Changes made can be displayed on the worksheet, respectively may be included monitoring the way in which the cell gets to changing and acquire a special mark. By positioning it you can get more detailed information about the change made.
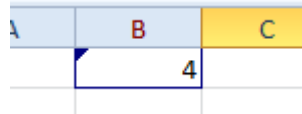

Monitoring changes can enable/disable:
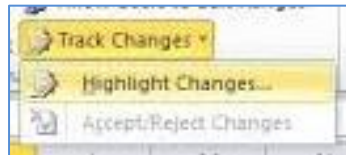
Accept, reject the changes to te worksheet

To accept or reject the changes go to **View ->Changes ->Accept/reject changes**. After that it will open a dialog box through which you will be able to review the changes and keep or discard the desired ones.

Compare and merge workbooks

Turning track changes automatically allow you to share the workbook. When several employees use the same workbook, you can use the **Compare and merge workbooks** to see all the changes at once and accept or reject them. Every person working in a shared workbook must save a copy of the book under a unique name that is opposed to the original. For example, if the original workbook is called "Statistics" associates could use the name "Statistics –Ana", "Statistics-Petar" and similarly, they can only be connected up sharing the same workbook. All copies you want to connect should be placed in the same folder.

Command Compare and merge workbooks is not immediately available but it is necessary to add to the toolbars.
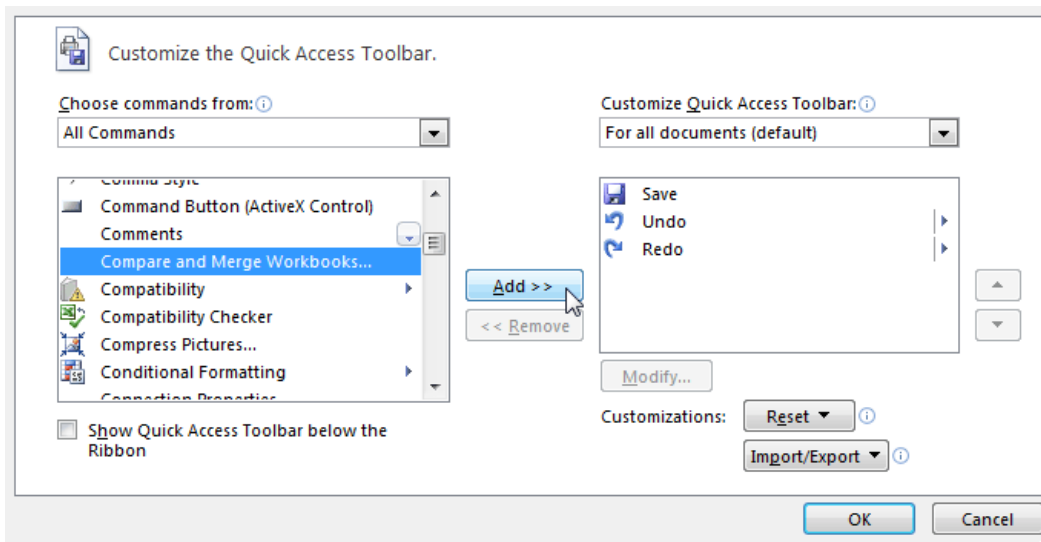
To make the comparison and merging open one of the copies of the workbook, click on the **Compare and merge workbooks**, you will then see a dialog box in which you will have to choose another copy of the same book. To select multiple copies, hold down CTRL or Shift on your keyboard while highlighting the names of copies.

The changes in each copy will be merged into a single copy. All changes and comments in that moment will be visible at the same time. For each user, changes will be shown in different colors. Now , as discussed in section 7.1.2. , you can keep or discard specific changes if necessary.

7.2 PROTECTION

Add, remove password protection for workbooks: opening, modification

Protecting a workbook allows changes to the appearance of the workbook (for example, prevents adding new worksheets). The protection does not apply to the contents of the workbook, but only to the appearance settings.

In order to protect the book, you should to the tab **Overview** in the category go to **Changes** click **Protect workbook**, then appears a dialog box in which you should enter the password. To remove the password, click again on the Workbook protection, and it will appear a dialog box in which you must enter the password and thus the workbook protection will be removed.
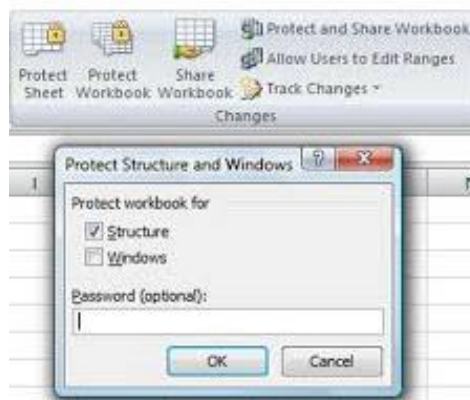
Protection, removal of the protection cell, worksheet with a password

On the tab **Overview** in the category **Changes** select **Protect sheet**. A dialog box will appear in which you need to enter password. At the same time, a list of actions you want to enable will be offered. Removing password and protection is performed so that you click again on **Protect sheet** and enter a password.

Hide, unhide formulas

To hide formulas, you must first remove the protection on all cells. For that it is necessary to mark the entire cells and then go to the **Home tab -> Cells ->Format -> Format cells**. In the dialog box that appears, go to the tab **Protection** and leave the boxes empty in front of **Locked** and **Hidden**, then mark the cell (cells)which you want to hide the formula and go back to the **Format** and **Format cells** and now on the menu from before, on the tab **Protection** check the box in front of **Hidden**. As the formulas were hidden the worksheet should be protected. The steps for this are explained in section 7.2.2. After this step formula will no longer be visible on the worksheet.

To remove the protection, it is necessary to remove the protection from the worksheet.

This manual is intended for learning in conjunction with materials published on the following links:

Using quizzes published on the links below, test kowledge of advanced work with spreadsheets in Microsoft Excel 2010 (*prepared and drafted:* Mario Dujlo)**:**

Editing data and layout: Name cells/cell range on a worksheet; Apply automatic formatting on the cells range; Create user number format; Use conditional formatting and special paste options; Import data from a text file delimited by a comma, space or a tab; Freeze row and/or column; Hide/unhide rows or columns or worksheets; Use automatic sub-totalling features; Use the table with one or two variables/"What if" tables	start the quiz
Protection and security: Protect/unprotect worksheet with a password; Add, remove password protection for a spreadsheet: to open, to modify: **Data sorting:** Sort the data according to the criteria in multiple columns; Perform a custom sort **Queries/Filters:** Create a query with one or more criteria using the available options; Use advanced queries/filtering options	start the quiz
Data connecting: Link data/chart within a worksheet; Link data/chart between worksheets; Link data/chart between workbooks; Link data/chart with the document of the text editing application; Consolidate data in adjacent worksheets by using the 3D sum function Update, break a link **Templates:** Use the template; modify the template **Charts:** Creating charts Format text or numbers on the axes of the chart; Re-position chart title, legend or data labels; Change the angle of slices in a pie chart; „separate" (explode) all the segments of the pie chart; Delete the data set from the chart; Change the chart type for a defined data series; Increase the distance between the columns in a 2D chart; Insert an image in a 2D chart	start the quiz

Using functions:
    Use the date and time functions: TODAY, DAY, MONTH, YEAR;
    Use mathematical functions: SUMIF, SUMPOSITIVE, ROUND;
    Use statistical functions: COUNT, PURECOUNT, COUNTA, COUNTIF;
    Use the functions for text: PROPER, UPPER, LOWER, CONCATENATE;
    Use financial functions: FV, NPV, PMT, PV, RATE;
    Use the functions for referencing and searching: HLOOKUP, VLOOKUP;
    Use logical functions: IF, AND, OR, ISERROR;
    Use available database functions: DSUM, DMIN, DMAX, DCOUNT;
    Use nested functions
	start the quiz

Analysis – Pivot Table:
    Create, modify a pivot table using the defined field names;
    Modify the data source and refresh a pivot table;
    Filter, sort, group data in a pivot table
Analysis – Scenarios/Versions:
    Create named scenarios/versions based on a default cell range;
    Show, edit, delete scenarios;
    Create a scenario summary report
Analysis – Formula Auditing:
    Trace precedent cells on a worksheet;
    Trace dependent cells on a worksheet;
    Show all formulas or see the locations of all formulas on a worksheet;
    Insert, edit, delete comments on a worksheet;
    Show, hide comments on a worksheet
Special tools – Macros:
    Record a simple macro (e.g. change the page settings);
    Run a macro;
    Assign a macro to a custom button on the toolbar
	start the quiz

Enhancing Productivity:
    Name cell ranges; use named cell ranges in a function;
    Use paste special options
Advanced Formatting:
    Apply an autoformat/table style to a cell range;
    Apply conditional formatting based on cell content;
    Create and apply custom number formats;
    Import delimited data from a text file
	start the quiz

8.   TERMS OF SERVICES

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