ITdesk.info - Project of computer e-education with open access - Manual for digital literacy

Advanced spreadsheets – LibreOffice Calc

Author: Mariza Maini
Author:
Mariza Maini

Translation:
Jasmina Šarić

Expert review:
Francis Pol Lim

Main title:
ITdesk.info – project of computer e-education with open access – Manual for computer literacy

Subtitle:
Advanced spreadsheets – LibreOffice Calc, manual

Expert review (croatian version):
Frane Šesnić, mag.ing.el., EdukaCentar, ustanova za obrazovanje, R. Croatia

Front page:
Silvija Bunić

Publisher:
Otvoreno društvo za razmjenu ideja (ODRAZI), Zagreb

Place and year of publication:
Zagreb, 2015.

Education and Teacher Training Agency of Croatia has approved the use of this Supplemental resource in Croatian language in primary schools with decision
klasa: 602-09/14-01/0419
urbroj: 561-03-03/10-15-4
Zagreb, April 2015.

Copyright:
Feel free to copy, print, and further distribute the whole or part of this publication, including for the purpose of organized education, whether in public or private educational organizations, but only for noncommercial purposes (ie free of charge to end users of this publication) and with attribution (source: www.ITdesk.info - project of computer e-education with open access). Derived works are not permitted without prior approval of the copyright holder (NGO Open Society for Idea Exchange - REFLECTIONS). Contact for permission: info@ITdesk.info
Today's society is characterized by rapid growth and development of information technology (IT), which resulted in great dependence of society, in a broad sense, on the knowledge and competence in the IT area. And although that dependence is growing from day to day, human right to education and information is not extended to the IT area. Problems, that affect society as a whole, are emerging, creating gaps and distancing people from the main reason and motivation for improvement, from opportunity. Being a computer illiterate person today means to be a person who is unable to participate in 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 (e.g. persons with disabilities, people with learning difficulties, female workers / and migrants, unemployed people, people living in remote places where computer education is not accessible).

This Manual, along 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, thus becoming an active member of modern IT society.

Sincerely yours,

iTdesk.info team
## CONTENT

Preface ........................................................................................................................................... i

1. FORMATTING .......................................................................................................................... 1

1.1 CELLS ....................................................................................................................................... 1

   Apply an autoformat/table style to a cell range ................................................................. 1
   Apply conditional formatting based on cell content ....................................................... 1

1.2 WORKSHEET .......................................................................................................................... 2

   Copy, move worksheets between spreadsheets ............................................................ 2
   Split a window. Move, remove split bars ................................................................. 3
   Hide, show rows, columns, worksheets ..................................................................... 4

2. FUNCTIONS AND FORMULAS ................................................................................................. 5

   Use functions and formulas: TODAY, NOW, DAY, MONTH, YEAR ................................. 5
   Use mathematical functions: ROUNDDOWN, ROUNDUP, SUMIF ................................. 5
   Use statistical functions: COUNTIF, COUNTBLANK, RANK .......................................... 6
   Use text functions: LEFT, RIGHT, MID, TRIM, CONCATENATE .................................. 7
   Use financial functions: FV, PV, PMT ............................................................................. 8
   Use lookup functions: VLOOKUP, HLOOKUP .................................................................... 9
   Use database functions: DSUM, DMIN, DMAX, DCOUNT, DAVERAGE ........................ 10
   Create a two-level nested function ............................................................................. 11
   Use a 3-D reference within a sum function ............................................................... 11
   Use mixed references in formulas ............................................................................. 12

3. CHARTS ....................................................................................................................................... 13

3.1 CREATING CHARTS ............................................................................................................... 13

   Create a combined column and line chart ................................................................. 13
   Add a secondary axis to a chart ................................................................................ 14
   Change the chart type for a defined data series ....................................................... 15
   Add, delete a data series in a chart ........................................................................... 15

3.2 FORMATTING CHARTS .......................................................................................................... 15

   Re-position chart title, legend, data labels ................................................................. 15
   Change scale of value axis: minimum, maximum number to display, major interval ...... 15
   Change display units on value axis without changing data source: hundreds, thousands, millions ................................................................. 16
   Format columns, bars, plot area, chart area to display an image ............................. 16

4. ANALYSIS .................................................................................................................................. 17

4.1 USING TABLES ....................................................................................................................... 17

   Create, modify a pivot table/datapilot ................................................................. 17
   Modify the data source and refresh the pivot table/datapilot .................................... 18
Filter, sort data in a pivot table/datapilot ............................................................. 18
Automatically, manually group data in a pivot table/datapilot and rename groups. .... 19
Use one-input, two-input data tables/multiple operations tables ................................ 21

4.2 SORTING AND FILTERING ............................................................................. 23
Sort data by multiple columns at the same time .................................................... 23
Create a customized list and perform a custom sort .......................................... 23
Automatically filter a list in place ...................................................................... 24
Apply advanced filter options to a list .................................................................. 25
Use automatic sub-totalling features .................................................................. 25

4.3 SCENARIOS .................................................................................................. 26
Create named scenarios ....................................................................................... 26
Show, edit, delete scenarios .................................................................................. 28

5. VALIDATING AND AUDITING ................................................................. 29

5.1 VALIDATING ............................................................................................... 29
Set, edit validation criteria for data entry in a cell range like: whole number, decimal, list, date, time ................................................................. 29
Enter the input message and the error warning .................................................. 29

5.2 AUDITING .................................................................................................... 29
Trace precedent, dependent cells. Identify cells with missing dependents .......... 29
Show all formulas in a worksheet, rather than the resulting values ..................... 30
Insert, edit, delete, show, hide comments/notes ................................................ 31

6. ENHANCING PRODUCTIVITY .................................................................. 32

6.1 NAMING CELLS .......................................................................................... 32
Name cell ranges, delete names for cell ranges ................................................... 32
Use named cell ranges in a function ................................................................... 32

6.2 PASTE SPECIAL ......................................................................................... 33
Use paste special options: add, subtract, multiply, divide .................................. 33
Use paste special options: values/numbers, transpose ...................................... 33

6.3 TEMPLATES ................................................................................................. 34
Create a spreadsheet based on an existing template .......................................... 34
Modify a template .............................................................................................. 34

6.4 LINKING, EMBEDDING AND IMPORTING ........................................... 34
Insert, edit, remove a hyperlink ........................................................................ 35
Link data within a spreadsheet, between spreadsheets, between applications .... 35
Import delimited data from a text file ................................................................. 36

6.5 AUTOMATION ............................................................................................. 37
Record a simple macro like: change page setup, apply a custom number format, apply autoformats to a cell range, insert fields in worksheet header, footer .......................... 37
Run a macro..................................................................................................................................................37
Assign a macro to a custom button on a toolbar. .........................................................................................38
7. COLLABORATIVE EDITING.........................................................................................................................39
7.1 TRACKING AND REVIEWING ....................................................................................................................39
Turn on, off track changes. Track changes in a worksheet using a specified display view ........39
Accept, reject changes in a worksheet........................................................................................................39
Compare and merge spreadsheets................................................................................................................40
7.2 SECURITY ...................................................................................................................................................40
Add, remove password protection for a spreadsheet: to open, to modify ......................................40
Protect, unprotect cells, worksheet with a password .............................................................................41
Hide, unhide formulas....................................................................................................................................42
8. GENERAL TERMS OF USE ..........................................................................................................................46
1. FORMATTING

1.1 CELLS

Apply an autoformat/table style to a cell range

- Mark the desired cell (a minimum of 3 rows and columns must be marked, including headers)
- Go to Format -> AutoFormat to open the AutoFormat dialog box
- Then choose the desired formatting in the dialog box

![AutoFormat dialog box](image)

Apply conditional formatting based on cell content

Create and apply custom number formats

Sometimes it is necessary to create the data in a way that the formatting is changed depending on a condition which is given before. This allows, for example, to highlight with different colour certain numbers that have a special meaning for you (e.g. temperatures higher than the average). In order to change the conditional formatting must first be ensured that AutoCalculate is turned on: Tools -> Cell Contents -> AutoCalculate.

- Select a cell, or range of cells, over which the conditional formatting wish to be applied
- Format -> Conditional Formatting -> Condition
- The dialog box will display all existing conditional formatting (if any)
- Click Add to define a new condition
• Select the desired condition and style that will be applied (it is possible to create your own style).
• Conditional formatting except Condition, offers and **Color scale** and **Data Bars** (selected in the same way as the Condition). Color scale is used when you want to set the background color of the cell depending on a value in a cell. This option is available only when the condition is applied to all cells. Data bars offers a graphical representation of data. It can only be used when the condition applies to all cells.

**1.2 WORKSHEET**

**Copy, move worksheets between spreadsheets.**

Selection of worksheets:
• Select a worksheet by simply clicking on the tab at the bottom of the worksheet
• You can select more consecutive sheets by clicking on the tab with the name of the first worksheet you want to bookmark, moving the mouse to the last row in the worksheet you want to bookmark and pressing the Shift + click on the tab. Tabs of marked sheets will change color to white.
• You can select more non-consecutive list by clicking on the tab with the name of the first worksheet you want to bookmark and clicking on the tabs of other sheets while holding down Ctrl. Tabs of marked sheets will change color to white.
• To select all the worksheets, right-click on any tab and choose Select All Sheets option.

To copy / move worksheets, it is necessary to mark desired sheets, then go to **Edit -> Sheet -> Move/Copy**. This will open a dialog box where you can then define whether you want to
copy or move the sheets. You can define whether you want to copy / move in the same workbook or in another, and choose the desired location in the workbook you want to copy / move worksheets.

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

Split a window. Move, remove split bars.

The window can be split vertically, horizontally, or both..

Vertical or horizontal split

- Select a row below the row in which you want to insert the division, or mark the column after column in which you want to insert the division.

- **Window -> Split**

Vertical and horizontal split (split into 4 parts)

- Select a cell that is located below the row where you want to set up a division, and that there is also the right of the column in which you want to set up a division.

- **Window -> Split**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The division in both cases removes so that it will again go to **Window -> Split**.

For moving the division it is sufficient to click on the dividing line and drag it to the desired page.

---

**Hide, show rows, columns, worksheets.**

In the Calc, you can hide elements so they are not visible on the computer screen, or when printing. However, the hidden elements can still be indicated when copying, by checking the elements that surround them. For example, if the line B is hidden, it will be highlighted when you select lines A and C.

**Hiding:**

- Select the column/row/worksheet that you want to hide
- **Format -> then select Sheet, Row or Column**, depending on what you want to hide -> **Hide**

**Showing:**

- Mark adjacent rows / columns / worksheets
- **Format -> Sheet/Row/Column -> Show (or right click, then Show)**
2. FUNCTIONS AND FORMULAS

Functions are predefined formulas that perform calculations by using specific values, called arguments, in a precisely defined order or structure. Different calculations can be performed using functions.

**Use functions and formulas: TODAY, NOW, DAY, MONTH, YEAR**

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

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

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

- **DAY(number)** - The ordinal number is the date of which day you are trying to find. If you for example, in cell A1, using the tool TODAY() store the current date, and then highlight the cell A2 and in the formula bar enter =DAY(A1) you will get a day of the month (ranging from 1 to 31).

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

**Use mathematical functions: ROUNDDOWN, ROUNDUP, SUMIF**

- **ROUNDDOWN(number; count)** - number rounded to the lower number closer to zero. It receives 2 arguments, namely the number of which is desired to round to the lower value and the number of digits on which it is desired to be rounded.

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

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

  - If the number of the 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) - rounds to a smaller number so that there are no decimal places, and the result will be 5

  =ROUNDDOWN(5.123456; 3) - rounds the given number to 3 decimal places, so the result will be 5.123

- **ROUNDUP(number; count)** - rounds to the number more further than 0. It receives 2 arguments, namely the number of which is desired to round to the higher value and the number of digits on which it is desired to be rounded.

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

• If the number of the digits is less than 0, the number is rounded up to the left of the decimal point.

Examples:
=ROUNDUP(52.4; 0) -> rounds to a larger number so that there are no decimal places and is the result of 53
=ROUNDUP(3.14182; 3) -> rounds the number to three decimal places and is the result of 3.142.

**SUMIF(range, criteria, sum_range)** -> is used for adding value in a range that meet these criteria. For example, if in a column, you want to add up only the numbers that are less than 9, the formula would be =SUMIF(C1:C15, “<9“). It receives 2 required arguments, namely the range of cells to which we want to function to apply, and the criteria in the form of a number, expression, cell reference, text or function that defines which cells will be added. Some examples of criteria are 15, „>12“, D2, „student“ or TODAY(). Additionally it receives the sum_range that 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 sum_range argument is omitted, Calc adds cells that are determined in the range argument (same cells to which the criteria applies).

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kategorija</td>
<td>Prozvod</td>
<td>Cijena</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Igračke</td>
<td>Pišani zec</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Kozmetika</td>
<td>Sampon</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Igračke</td>
<td>Autić</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Hrana</td>
<td>Keksi</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>=SUMIF(A2:A5, &quot;Igračke&quot;, C2:C5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this case with the formula =SUMIF(A2:A5, "Igračke", C2:C5) we said that we want to get the sum of all prices for products that fall into the category of Toys (Igračke).

**Use statistical functions: COUNTIF, COUNTBLANK, RANK.**

- **COUNTIF(range, criteria)** -> counts the number of cells within a range that meet only the criteria you specify. It recieves 2 mandatory arguments, namely the range of cells to be counted and the number of criteria, ie. 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 then we will write down = COUNTIF (A2: A20; 10).

  If the number 10 appears in three cells that will get that number as a result.

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

- **RANK(value, data, type)** - returns the position of the number in the list of numbers. Position of the number is its relative size in relation to other values in a list, or when looking at it as a sorting, then the position of a number would be its position. Receives 3 mandatory arguments, namely the number whose position you want to find, data, i.e. the field of list of numbers or a reference to a list of numbers, and the order or the number that determines how to determine the position of the number. If the argument is the order of 0 or omitted, then the ranking is done as if the argument data is sorted descending, otherwise the ranking is done as if the argument data is sorted ascending.

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

- **LEFT(text, number)** - returns the first character or characters from the left side (from the beginning of the text) of a text based on the specified number of characters. It receives 2 arguments of which the text is optional and refers to the text string containing the characters you want to extract, and the number of characters which is not mandatory, and determines the number of characters that the function will allocate. If num_chars is indicated, it must be greater or equal to zero. If it is greater than the length of the text, it returns to the full text, if the number of characters is omitted, it is assumed that it is 1.

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

- **RIGHT(text, number)** - does the same thing as the LEFT but returns the first character or characters from the right side (from the end of the text).

- **MID(text, start, number)** - function returns a number of characters from a text string starting from the point that you specify on the basis a specified number of characters. It receives 3 mandatory arguments, and those are text that contains characters which we want to extract, the initial number or location of the first character that we want to extract from the text and the number of characters or the number of characters that you want from MID function to return.

  - If the argument is the initial number greater than the length of text, MID function returns "" (empty text).
  
  - If the initial number is smaller than the length of the text, and the sum of the arguments start number and the number of characters exceed the length of text, MID function returns the characters to the end of the text.
  
  - If the argument is the initial number smaller than 1, MID function returns an error #VALUE!.
  
  - If the argument the number of characters is negative, MID function returns an error #VALUE!.
- Suppose that in cell F1 is the text "Mathematics". If we write the function = MID(F1,3,4) we will get a "theme" as a result.

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

  If in cell A1, we have a text „Today is a beautiful day“, with function =TRIM(A1) we would get „Today is a beautiful day“ as a result, i.e. The spaces from the beginning of the text would be removed.

- **CONCATENATE(text1, text2 ...)** -> function that combines several text strings into one text string. Connected could be text, numbers, cell references, or a combination of both. Receives one mandatory parameter, text1, and it is the first string that should be attached. Other parameters are optional and represent other series that we want to connect.

  If, for example, in one column we have the names of students, and in the second their last names, full name can be obtained from =CONCATENATE(A1," ",B1). Second argument in the example is (" ") i.e. space. Be sure to specify the spacing and punctuation which you want to appear in the final result. Character & is equal to function CONCATENATE, so = A1 & B1 returns the same as = CONCATENATE(A1, B1)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>Petar</td>
<td>Peric</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>Petar Peric</td>
</tr>
</tbody>
</table>

**Use financial functions: FV, PV, PMT**

**FV(Rate, NPer, Pmt, PV, Type)** -> returns the future value of an investment based on periodic, constant payments and interest rates.

- **Rate** – required. The interest rate per period.
- **NPer** – required. Total annuity payment period.
- **Pmt** - Repayment in each period; cannot be changed during the duration of the annuity. Rate usually contains principal and interest without additional taxes and charges. If you omit the rate, you must enter the argument PV
- **PV** - optional. The present value, or the total sum of the present value of the stream of future payments. If PV is omitted, it is assumed that it is the 0 (zero), and you must specify the argument Pmt.
- **Vrsta** - optional. Number 0 or 1 and indicates when payments are due. If the type is omitted, it is assumed that it is 0, which means that payments are made at the end of the period. 1 indicates that the payments are made at the beginning of the period.
Example: Suppose that your balance is 500 kn (which is the present value), and you want it to deposit in five years with an annual interest rate of 2.5%. At the end of each month will pay another 200 kn.

If we enter =FV(2.5%/12, 5*12, -200, -500) as a result we get 13 334,61 kn. Therefore in 5 years the value of your account will be 13 334,61. We divided the interest rate with 12 because payments are made monthly, and the number of years is multiplied by 12 to get the number of months of repayment. PMT and PV have a negative sign because they represent benefits.

\[ \text{PV} (\text{Rate}, \text{NPer}, \text{Pmt}, \text{FV}, \text{Type}) \text{ -> returns the current value of the investment. The present value is the total amount of the present value of the series of future cash expenditures. The arguments it receives are the same as for the FV function with the difference that it doesn't receive the argument PV but FV, which indicates future value or cash balance you want to attain after the last payment. FV may be omitted, but then the state the amount of the installment must be stated.} \]

Example: Suppose we want to find out how much we should pay today in order to have, with 8% annual interest rate and with a monthly income of 500 kn, after 4 years, 20 000 kn on account.

If we enter =PV(8%/12;48;500;20000) as a result we would get -35 019,37 kn. This means that we would have had to pay that amount in order to receive a 500 kn monthly for four years, and that at the end 20 000,00 remain on the account. Hence the negative, because 35 019,37 kn represents expenditure.

\[ \text{PMT} (\text{Rate}, \text{NPer}, \text{PV}, \text{FV}, \text{Type}) \text{ -> function which serves to determine the rate of repayment of loans based on interest rates and periodic, constant repayment. Receives 5 arguments, of which the first 3 are required. Rate, Nper, and type have the same meaning as in the previous two functions. PV is the present value or principal. FV is optional and represents the future value, if not specified, the default value will be 0.} \]

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

\[ \text{VLOOKUP} (\text{SearchCriterion}, \text{Array}, \text{Index}, \text{SortOrder}) \text{ -> this function performs vertical search, or search by column. As arguments it receives the value by which it is performing the search, a series of columns that are being searched, ie. the index number of the column from which it wants to be recieved as a return value, a value that is in the same row as the value which is transmitted. SortOrder is optional and indicates whether the first column in a series arranged in ascending order. If it is not specified, or if it is TRUE or 1, it is assumed that the data is sorted ascending. In this case, if the function does not find an exact match, it will return to the first maximum value which comes before the required value (let's say we are looking for the value of 20, and it does not exist, it will return the nearest lower value than required, ie. if there was a value 19, we would get as a return value). If for SortOrder is put FALSE or zero, then if the function does not find the exact matching, as a result it returns an error "Error: Value Not Available".} \]
The upper figure shows an example where in one column we have the codes, and in the other product names. Let’s say you want to find out which product is under the code 3, you would enter \( =\text{VLOOKUP}(3, \text{A1:B4}, 2) \) and as a return value you would get Bomboni.

In the upper case, the required product is under the code 3 which does not exist. Since we have stated that the first column is sorted descending (TRUE in code), the function will bring back the 2 or the first highest value that is less than the required value.

**HLOOKUP(SearchCriterion, Array, Index, SortOrder)** -> works in the same way as VLOOKUP, except the search is conducted by the words.

**Use database functions: DSUM, DMIN, DMAX, DCOUNT, DAVERAGE**

**DSUM(Database, DatabaseField, SearchCriteria)** -> adds numbers that meet certain conditions.

All three receiving arguments are mandatory, and those are: Database, or a range of cells that makes a list or database, DatabaseField is a column that is used in the function, and SearchCriteria is a range of cells that contains the conditions that you specify.

Example: For the table below, if we call a function = DSUM (A4: D8, C4, A1: B2) we get 9 as a result, i.e. the sum of the prices per unit for all orders that have a serial number over 10, and in which the amount is larger than or equal to 3.
DMIN(Database, DatabaseField, SearchCriteria) -> shows the lowest number in the field (column) of the entry in a list or database that meets certain requirements. The receiving arguments are the same as function DSUM. If we call a function =DMIN(A4:D8,C4,A1:B2) over the table above, as a result we would get 4, i.e. the lowest price per unit.

DMAX(Database, DatabaseField, SearchCriteria) -> shows the highest number in the field (column) of the entry in a list or database that meets certain requirements. The receiving arguments are the same as function DSUM and DMIN. If we call a function =DMAX(A4:D8,C4,A1:B2) over the table above, as a result we would get 5, i.e. the highest price per unit.

DCOUNT(Database, DatabaseField, SearchCriteria) -> Counts the cells that contain numbers in a field (column) of the entry in a list or database that meet certain conditions. For this function it applies all of the above like for the earlier functions, so the call =DCOUNT(A4:D8,C4,A1:B2) would return number 2, meaning that 2 cells meet the required criteria.

DAVERAGE(Database, DatabaseField, SearchCriteria) -> Determines the average value of the field (column) of the entry in a list or database that meet certain conditions. For this function it applies all the previously mentioned, so the call =DAVERAGE(A4:D8,C4,A1:B2) would return 4.5 i.e. it would divide what DSUM returned what DCOUNT returned in this case.

Create a two-level nested function

Sometimes we need to use a function as an argument that be forwarded to another function. This is called nesting.

When Function B is used as an argument of the function A, B function is a two-level function. The example of two-level nested function would be = ROUND(SUM (D1 : D3), 2). Here the function ROUND as a first argument receives what function SUM returns.

Use a 3-D reference within a sum function

3D references allow us to simultaneously reference a cell in multiple worksheets. =SUM(Sheet2:Sheet13.B5) -> returns the sum of all values contained in the cell B5 on all the worksheets between 2 and 13, including those 2 worksheets.
=SUM(Sheet1:Sheet10.A1:C3) -> returns the sum of all the values in the cells in the range A1:C3 in the worksheets between 1 and 10, including those 2 worksheets.

**Use mixed references in formulas**

Mixed references allow us to combine one absolute and one relative label whether it is a column label or tag line. Relative references are the ones that will change if we copy to another location the cell with the formula in which they are used. These are defined only with labels of column and row (eg. A1, B3). Absolute references are the ones which when copying or moving formulas always reference the same cell. They should be marked in addition to the label of the column and row of referenced formula, we put a dollar sign ($) (e.g. $A$1).

There are 2 variations of mixed references:

- **Absolute column - relative row.** An example of such a reference is $A3. With these references the $ prefix is located in front of letter which indicates column. If we copy the formula with this reference, by changing the cell in which the formula is, only the address of the row would be changed. If we copy a formula in which we use the above reference $A3, into one row below and one column to the right of the one containing the original formula, the reference will change to $A4.

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

3.1 CREATING CHARTS

Create a combined column and line chart.

In the table first mark all the data you want to show in the chart (for this example a whole table will be marked).

<table>
<thead>
<tr>
<th>Uspjeh</th>
<th>Matematika</th>
<th>Hrvatski</th>
<th>Povijest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odličan</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Vrlo dobar</td>
<td>7</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Dobar</td>
<td>10</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Dovoljan</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Nedovoljan</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

After that go to Insert -> Object -> Chart. At that moment a wizard for graphs will be launched, allowing you to select column and line chart.
Calc will implicitly take data from the last column and display them in-line. If you want for example Matematika to be displayed in-line, and the other two items in the column,s it is necessary to mark the graph and then Format -> Data Ranges, then remove the data from Mathematics to the last position by clicking on the page highlighted in the picture.

Add a secondary axis to a chart.

It is possible to add a secondary X axis, secondary Y axis, or both.
Mark graph, right click and Insert/Delete Axes.
This will open a dialog box where you can then choose what you want to add.

![Axes dialog box]

**Change the chart type for a defined data series**

Mark the desired chart and right click the mouse and then choose **Chart Type**. This will launch a chart wizard in which you can change the chart.

**Add, delete a data series in a chart**

Right-click on chart then select **Data Ranges**. In the dialog box, click on the Remove to clear a series of data or Add to add a series of data. When adding a series of data it is necessary to define the name of a series and the range of the X and Y axis (see figure under Create a combined column and line chart).

**3.2 FORMATTING CHARTS**

**Re-position chart title, legend, data labels**

To modify the properties of elements it is necessary to mark the desired element (e.g. title) and then right-click. In the menu that appears, select **Position and Size**.

![Chart title and data labels]

**Change scale of value axis: minimum, maximum number to display, major interval**

Mark the desired axis and then right-click. Select option **Format Axis**.
In the menu that appears, choose a tab **Scale**, in which you can then determine the minimum, maximum and the main interval.

![Y Axis](image)

**Change display units on value axis without changing data source: hundreds, thousands, millions**

This is accomplished in the same way as described in Change scale of value axis. If we want to show the value in the hundreds, we will add a 0, for 1000 2 zeros *etc.*

![Y Axis](image)

**Format columns, bars, plot area, chart area to display an image**

To change the properties of the elements it is necessary to mark the chart, and then go to **Format -> desired element.**
4. ANALYSIS

4.1 USING TABLES

Create, modify a pivot table/datapilot.

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

For creating the pivot table go to Data -> Pivot table -> Create. In the first dialog box that appears, choose the source of your data.

In the next step in the dialog box, select the deployment of data in a pivot table:

You can drag fields as you wish. If for example we want to see how many people traveled to which country, we will create a new row for each country in way that we drag a field Country in the Row Fields section of the dialog menu, and Person in the Data fields.

Calc in the pivot tables implicitly adds numbers. That is not possible in this case when we have a name, so we have to make a small adjustment. When we drag Person in the Data Fields, a button that says "Sum - Person" appears, in order to modify this, click on this button and when the dialog box opens, select Count. In this way we define that we do not want to add up the people, but we want to count them. The result is the following table, in which we get the total number of persons who have traveled in the a particular country. In the same way, we can get statistics on the reasons for the trip.
To modify a pivot table it is enough to right-click within it and choose **Edit Layout** option.

**Modify the data source and refresh the pivot table/datapilot.**

Refresh data sources -> click inside the table, then right-click and choose **Refresh**.

To edit data sources -> click inside the table, then right-click and **Edit Layout**. In the dialog box that appears click **More**.

And after that, in **Selection from** enter a new source.

**Filter, sort data in a pivot table/datapilot.**

The data in a pivot table is automatically sorted increasing. You can change **sorting**:

- Click on the down arrow located in the column header and select a different sort
- Automatically sort by selecting **Data Field Options**. To get to this menu you need to click inside the table then right-click and **Edit Layout**. In this dialog box, double-click the row/column you want to edit. This will open a dialog box **Data Field**. Within it, click on **Options**.

To filter the data you need to click on the cell containing the word **Filter** (automatically created when you create pivot tables) and then meet the filtering criteria of your choice.

**Automatically, manually group data in a pivot table/datapilot and rename groups.**

**Grouping of categories with scalar values**

- It is necessary to select a single cell in the the category you want to group and go to **Data -> Group and Outline -> Group**. In the dialog box that appears, specify the criteria for grouping.
In the picture below as an example is a table in which we have measurements of velocity and their frequency of occurrence.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>km/h</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>81</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>82</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>83</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>84</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>87</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>88</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>89</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>90</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>91</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>92</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>93</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>94</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>95</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>100</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If in the grouping dialog box, you enter values as shown in the picture, then the grouping will be made in groups with an interval of 5, i.e. the result will look like the following figure.

Grouping categories with text values

For categories that contain text values it is not possible to create intervals. Multiple categories can be grouped in a way that you mark the desired category, then go to Data -> Group and Outline -> Group.

For the example, on the table in the following figure, the first three departments are marked and it is made a group out of them.
Calc automatically assigns the names of the groups. To change the group name, highlight the cell and in the input field for value, enter the name of the group (it is possible that after this you will have to refresh the page (right click and Refresh)).

Use one-input, two-input data tables/multiple operations tables.

Tables with one input -> will be explained through the following example. Let’s say you produce toys that you sell at 10 kn each. The cost of making each toy is 2 kn. In addition, you have 10 000 fixed costs annually. The question that arises is how much you earn in a year if you sell a certain amount of toys. To begin with, we will put 2000 pieces. In cell B5 we will calculate profits for the amount through formula =Amount *(Selling price – Cost by unit) – Fixed costs, =B4*(B1-B2)-B3.

Then in the column D we enter various amounts of sold toys.

Highlight the range D2:E11 and go to Data -> Multiple Operations. In the dialog box that appears, we reference the field B5 for the formula, while for input variable we reference B4, i.e. the amount. Thus we have said that the amount is changeable. What will Calc now do is
to take each amount specified in column D, and insert it into the formula. The result for different amounts will appear in column E.

Tables with two input variables -> in this case we will observe changes in the amount and selling prices and accordingly calculate earnings.

In cells E1, F1, G1, H1 we will enter prices 8, 10, 15, 20. Mark the range D1:H11 then go to Data -> Multiple Operations. Enter the formula in the dialog box, and for Row input cell choose one with a price (B1) because we have prices listed in the row, and for Column input cell choose the one with the amount (B4).

In this way, we have said that, when calculating, we want to take into account two variables, that is the amount will be calculated in a way that for each quantity/price we insert other data. As a result we get a table with all the possible variations. Thus, in cell F2 are the earnings in the case when we sell 500 units at a price of 10 kn.
4.2 SORTING AND FILTERING

Sort data by multiple columns at the same time

You must first select the data, then go to the Data -> Sort.

In the dialog box, then enter the order in which you want to sort.

Create a customized list and perform a custom sort

To create a custom list go to Tools -> Options -> LibreOffice Calc -> Sort Lists.

In the dialog box, click Add and enter the desired order, from top to bottom.

To use a desired custom list, mark what you want to sort and go to Data -> Sort. In the dialog box, go to the tab Options and select Custom sort order and select the desired sorting.
Automatically filter a list in place

We will use the following table as an example.

<table>
<thead>
<tr>
<th>Učenik</th>
<th>Matematika</th>
<th>Hrvatski</th>
<th>Rezultat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ana</td>
<td>85</td>
<td>87</td>
<td>zadovoljio</td>
</tr>
<tr>
<td>Filip</td>
<td>50</td>
<td>77</td>
<td>zadovoljio</td>
</tr>
<tr>
<td>Janko</td>
<td>72</td>
<td>22</td>
<td>nije zadovoljio</td>
</tr>
<tr>
<td>Mirjana</td>
<td>24</td>
<td>12</td>
<td>nije zadovoljio</td>
</tr>
</tbody>
</table>

To enable the automatic filtering is necessary to mark the table and go to Data -> Filter -> AutoFilter. As a result, down arrows will appear in the header of each column.
Apply advanced filter options to a list

When using the advanced filter, the arrows of drop-down menu don't appear, instead we need to enter criteria in the scope of criteria.

If we want to see, for example, only students who have more than 50 points in mathematics then we would define it as follows:

<table>
<thead>
<tr>
<th>Matematika</th>
<th>Matematika</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50</td>
<td>&lt;100</td>
</tr>
</tbody>
</table>

We mark a table in which we want to do the filtering and on tab Data -> Filter -> Advanced Filter.

The dialog box will then appear and then we bring our criteria in it, or in this case in the range of criteria we import table with conditions that we have defined, and then click OK.

![Advanced Filter dialog box](image)

The result will be a table in which only the students who meet the defined criteria will be shown.

<table>
<thead>
<tr>
<th>Učenik</th>
<th>Matematika</th>
<th>Hrvatski</th>
<th>Rezultat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ana</td>
<td>85</td>
<td>87</td>
<td>zadovoljio</td>
</tr>
<tr>
<td>Janko</td>
<td>72</td>
<td>22</td>
<td>nije zadovoljio</td>
</tr>
</tbody>
</table>

Use automatic sub-totalling features.

If in the worksheet, we have information on for example sales of various products, we can calculate how many of products were sold by product type in a simple way. It is necessary to select the data and then go to Data -> Subtotals and to enter information in the dialog box, in accordance with the desired results.
4.3 SCENARIOS

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

Create named scenarios

In the table, mark the cells in which the values will be changed and then go to Tools - > Scenarios, then save scenario.
In cells for which you specified that the value will change, you can now enter other values and create a new scenario.

In the drop-down menu you can now choose the scenario and see the changes. In this case, a total number of sold products, for example.
Show, edit, delete scenarios

You can continue to operate with scenarios via Navigator.
5. VALIDATING AND AUDITING

5.1 VALIDATING

Set, edit validation criteria for data entry in a cell range like: whole number, decimal, list, date, time

Validation criteria: we use validation criteria when we want to enable to involve a certain type of data in a particular cell or cells (whole number, date, decimal number, etc.). It is also possible to limit the input to the values that are in specified interval, or equal to a certain value, lesser/greater than certain value etc.

- Select the cells in which you want to change certain criteria
- Data -> Validity
- When the dialog box opens, enter the desired settings

![Validity Dialog Box]

**Enter the input message and the error warning**

To enter an input message, follow the steps as in the previous instructions, and then click on tab **Input Help**, enter the message in accordance with the criteria of evaluation. This message will appear when you highlight a cell for which the criteria is defined.

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

5.2 AUDITING

Trace precedent, dependent cells. Identify cells with missing dependents

Formulas in Calc may contain precedents and can serve as dependents on other formulas. Cells often serve as both precedents and as dependents.

In order to monitor, we can use Detective.
In order to see precedent cells we must mark the cell containing a formula, and then go Tools -> Detective -> Trace Precedents.

![Excel screenshot showing cell B8 with formula SUM(B2:B7) and precedent cells B2:B7](image)

The upper figure shows that the cells B2:B7 are precendents of the cell B8. The arrows shows the flow of information, that is all values are added together and the result is in the cell B8.

For monitoring dependent cells the procedure is identical, except you need to select Tools -> Detective -> Trace Dependents.

![Excel screenshot showing cell E10 dependent on cells B8 and B19](image)

From the figure, you can see how cell E10 is dependent on cells B8 and B19. That is, all changes that occur in these cells will be reflected in the cell E10.

For removing the arrows go to Tools -> Detective -> Remove Precedents/Remove Dependents ili Remove All.

Tracing errors: Tools -> Detective -> Trace Errors.

Show all formulas in a worksheet, rather than the resulting values

Tools -> Options -> LibreOffice Calc -> View -> check the box for Formulas
Insert, edit, delete, show, hide comments/notes

For inserting, editing, deleting, showing, hiding comments it is enough to mark the cell and then right click. On the menu that appears, then choose the desired action.

To edit comments it is enough to double click inside the comment, and edit content.

Cells with a comment can be identified by a small red square that appears in the top right corner of the cell.
6. ENHANCING PRODUCTIVITY

6.1 NAMING CELLS

**Name cell ranges, delete names for cell ranges**

It is necessary to select a cell or range of cells which we want to name, and then click the Name box located in left edge of configuration task bar. Enter the desired name and click ENTER.

Another option to define the title is through tab **Insert -> Names -> Manager**. The name can be deleted through the manager.

**Use named cell ranges in a function**

Named ranges in functions are used in a simple way, which is that instead of entering the cell range in a function, we enter the name. In the following example, the cells containing
the amounts are given the name Quantity, and then in the formula for summarizing, instead of the cell range, we only enter only the name Quantity.

6.2 PASTE SPECIAL

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

Using the dialog box Paste Special, complex items can be copied from the worksheet and pasted in the same or another worksheet using certain attributes of copied data or using mathematical operation that you want to apply on copied data.

In the example below, in one column we have values 1,2,3,4. We mark these values and we click on Copy. Then mark the column with the values 5,6,7,8 and right-click opens a menu with possibilities among which there is a Paste special (to Paste Special we can get also through the main menu Edit -> Paste Special). In the Paste Special then select the desired action, such as Paste all and Add. After we click OK in the second column we will get summed values from the first and second column. In the same way we can achieve other operations.

Use paste special options: values/numbers, transpose

If you want to copy only the numbers/text/formula located in the specific cells, it is necessary to select the desired cell and then Copy. Right-click on the location where you want to copy and select the option Paste Only and then Text/Number/Formula, depending on what you want to copy. The figure below shows the result of choosing to copy only numbers.
Transpose: If you select this option, it changes the columns of copied data to the rows and vice versa. As in previous cases, it is necessary to select the desired cell and Paste Special -> Transpose.

6.3 TEMPLATES

Create a spreadsheet based on an existing template

Go to File -> New -> Template and in the dialog box that appears, choose the desired template.

![Template Manager](image)

Modify a template

In the templates, you can make changes as you wish, or you can create your own template. When you are finished editing, the template must be saved in order to be used again.

Go to File -> Save as and in the dialog box that appears, select the Save as type -> ODF Spreadsheet Template.

![Save as dialog box](image)

6.4 LINKING, EMBEDDING AND IMPORTING
Insert, edit, remove a hyperlink

To insert a hyperlink mark the cell where you want to insert a hyperlink and then **Insert -> Hyperlink**. In the dialog box that opens, select the desired settings. To edit, the steps are the same. Therefore, mark the cell and open the dialog box for hyperlinks.

Hyperlink is removed when you mark the cell, then right-click and **Clear Direct Formating**.

![Hyperlink dialog box](image)

Link data within a spreadsheet, between spreadsheets, between applications

**Linking data within a spreadsheet:**

- Referencing of data is performed through formula `=spreadsheet_name.cell_name`. If in a cell in the worksheet Sheet1 you enter `=Sheet2.A1` thus, you said that you want the cell to contain data contained in cell A1 of the worksheet Sheet2. Any changes that occur in the differentiated cell is automatically copied to the cell in which you entered the formula.

**Linking data between spreadsheets:**

- To the spreadsheet for which you want to enter a reference to another cell, mark the desired cell and enter `. Then go into workbook which contains the data you want to reference and mark cell. Go back to the first workbook. Calc will automatically insert in a cell a reference to the highlighted cell. Reference is in the form: `=file:///C:/Users/Desktop/Untitled 1.ods`#Sheet2.A3 -> i.e. contains the path to the document which is referred to and the name of the worksheet and cells.

**Linking data between applications:**

- To link data between Calc and, for example, Open Libre Writer, we use DDE, i.e. Dynamic Data Exchange. DDE provides copying information in real time, where all changes that are made in the Calc worksheet are automatically transferred to the Writer document. Mark cells that you want to link and select Copy.
- In the Writer document, select Paste Special, and in the dialog box that appears, select DDE link.

![Paste Special dialog box](image)

- Any changes you make in the Calc worksheet will be automatically updated in the Writer document.

**Import delimited data from a text file.**

Delimited files are files that contain data separated by commas, tabs, etc. If we have for example a text file with data is stored in a way that they are separated by a semicolon (1;2;3;4;5) these data can be imported into Calc by going to File -> Open and then selecting the desired file. This will open a dialog box in which we can define, for example, how the data are delimited (Separated by).

![Text Import dialog box](image)

Upon completion, the data will be imported into Calc worksheet.
6.5 AUTOMATION

Record a simple macro like: change page setup, apply a custom number format, apply autoformats to a cell range, insert fields in worksheet header, footer

Macros allow you to record specific steps that can then be performed by simply launching macros which will then make the recorded steps for you.

For turning on the option for creating macro commands you must first go to Tools -> Options -> LibreOffice -> Advanced then mark the box for Enable macro recording.

When you want to start recording go to Tools -> Macros -> Record macro. A dialog box will open, in which you can click to eventually stop recording.

Upon completion of the recording, a dialog box will open, where you enter a name for your macro.

Run a macro

Go to Tools -> Macros -> Run macro. This will open a dialog box from which you select the macro you want to run and click Run.
Assign a macro to a custom button on a toolbar.

Select View -> Toolbars -> Customize, then click Add.

In the dialog box that opens then click Add then choose the desired macro. Macro will appear on the toolbar.
7. COLLABORATIVE EDITING

7.1 TRACKING AND REVIEWING

Turn on, off track changes. Track changes in a worksheet using a specified display view

To enable tracking of changes you must first go to File -> Properties -> Security then select box for Record changes. It is also necessary to enable the sharing of the document, and that can be done by going to Tools -> Share document and selecting the box for Share this spreadsheet with other users.

When a change occurs within a cell, the cell gets a red edge and by positioning the cursor on that cell, a description of the change is displayed.

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

08/08/2014 07:19:51: Cell D1 changed from 'D1' to '5'

To display all the changes go to Edit -> Changes -> Show. In the dialog box that appears, you can filter the changes you want to see (by date, author, etc.).

![Show Changes dialog box]

Tracking of changes can be deactivated via Edit -> Changes -> Record.

Accept, reject changes in a worksheet

Go to Edit -> Changes -> Accept or reject. It will open a list of all the changes that you can accept by simply clicking on Accept to or reject it by clicking on the Reject.
Compare and merge spreadsheets.

Open the original document and go to **Edit -> Changes -> Merge document**.
This will open a dialog box in which you must select the copy of the document that you want to merge. Then click Open.

After merging of the documents an Accept or Reject Changes dialog box will appear in which the changes will be displayed. In the manner described in the previous section, you can now accept or reject the changes.

Since it can happen that someone forgets to record their changes, it is possible to compare the documents via **Edit -> Compare Document**.

- Open the modified document that you want to compare to the original document
- **Edit -> Compare Document**
- In the dialog box that appears, choose the original document
- At this point, the document will be marked with all the changes you can then keep or discard as you wish.

### 7.2 SECURITY

**Add, remove password protection for a spreadsheet: to open, to modify**

Protection of workbooks protects the structure of the document. If enabled, it allows insertion, deleting, renaming, moving or copying worksheets. To activate it, go to **Tools -> Protect Document -> Document**.

In the dialog box that appears, it is possible to add a password (optional).
To remove the password go to Tools -> Protect Document -> Document and then enter the password.

**Protect, unprotect cells, worksheet with a password**

The cells can be protected in the following way: go to Format -> Cells, and in the dialog box in the Cell Protection tab, check the box for Protected.

The cells are protected only when the worksheet is also protected.

To protect a worksheet go to Tools -> Protect Document -> Sheet. In the dialog box that appears, you can then define a password.
To remove the protection of the worksheet go back to **Tools -> Protect Document -> Sheet** and enter a password.

**Hide, unhide formulas.**

First go to **Format -> Cells** and in the dialog box in the Cell Protection tab, check the box for Hide formula.

After that, it is necessary to enable the protection of the worksheet as previously discussed. After protecting a worksheet, the formulas will not be displayed anymore.

**Worksheet without hiding formula:**
Worksheet with hidden formulas:
This manual is designed for learning in addition to materials published on the following links:

By using the quizzes posted on the links below test your knowledge of advanced work with spreadsheets in the Microsoft Excel 2010 program (prepared and drafted by: Mario Dujlo):

<table>
<thead>
<tr>
<th>Editing data and layout:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name cells/cell range on a worksheet;</td>
<td></td>
</tr>
<tr>
<td>Apply automatic formatting on the cells range; Create user number format;</td>
<td></td>
</tr>
<tr>
<td>Use conditional formatting and special paste options;</td>
<td></td>
</tr>
<tr>
<td>Import data from a text file delimited by a comma, space or a tab;</td>
<td></td>
</tr>
<tr>
<td>Freeze row and/or column;</td>
<td></td>
</tr>
<tr>
<td>Hide/unhide rows or columns or worksheets;</td>
<td></td>
</tr>
<tr>
<td>Use automatic sub-totalling features;</td>
<td></td>
</tr>
<tr>
<td>Use the table with one or two variables/&quot;What if&quot; tables</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protection and security:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect/unprotect worksheet with a password;</td>
<td></td>
</tr>
<tr>
<td>Add, remove password protection for a spreadsheet: to open, to modify</td>
<td></td>
</tr>
<tr>
<td>Data sorting:</td>
<td></td>
</tr>
<tr>
<td>Sort the data according to the criteria in multiple columns;</td>
<td></td>
</tr>
<tr>
<td>Perform a custom sort</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Queries/Filters:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a query with one or more criteria using the available options;</td>
<td></td>
</tr>
<tr>
<td>Use advanced queries/filtering options</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data connecting:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link data/chart within a worksheet;</td>
<td></td>
</tr>
<tr>
<td>Link data/chart between worksheets;</td>
<td></td>
</tr>
<tr>
<td>Link data/chart between workbooks;</td>
<td></td>
</tr>
<tr>
<td>Link data/chart with the document of the text editing application;</td>
<td></td>
</tr>
<tr>
<td>Consolidate data in adjacent worksheets by using the 3D sum function</td>
<td></td>
</tr>
<tr>
<td>Update, break a link</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Templates:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the template; modify the template</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charts:</th>
<th>start the quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating charts</td>
<td></td>
</tr>
<tr>
<td>Format text or numbers on the axes of the chart;</td>
<td></td>
</tr>
<tr>
<td>Re-position chart title, legend or data labels;</td>
<td></td>
</tr>
<tr>
<td>Change the angle of slices in a pie chart; „separate” (explode) all the segments of the pie chart;</td>
<td></td>
</tr>
<tr>
<td>Delete the data set from the chart;</td>
<td></td>
</tr>
<tr>
<td>Change the chart type for a defined data series;</td>
<td></td>
</tr>
<tr>
<td>Increase the distance between the columns in a 2D chart;</td>
<td></td>
</tr>
<tr>
<td>Insert an image in a 2D chart</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Analysis – Pivot Table:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Create, modify a pivot table using the</td>
<td>Create, modify a pivot table</td>
</tr>
<tr>
<td>defined field names;</td>
<td>using the defined field names;</td>
</tr>
<tr>
<td>Modify the data source and refresh a</td>
<td>Modify the data source and</td>
</tr>
<tr>
<td>pivot table;</td>
<td>refresh a pivot table;</td>
</tr>
<tr>
<td>Filter, sort, group data in a pivot table</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis – Scenarios/Versions:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Create named scenarios/versions based on</td>
<td>Create named scenarios/versions</td>
</tr>
<tr>
<td>a default cell range;</td>
<td>based on a default cell range;</td>
</tr>
<tr>
<td>Show, edit, delete scenarios;</td>
<td>Show, edit, delete scenarios;</td>
</tr>
<tr>
<td>Create a scenario summary report</td>
<td>Create a scenario summary report</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis – Formula Auditing:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace precedent cells on a worksheet;</td>
<td>Trace precedent cells on a</td>
</tr>
<tr>
<td>Trace dependent cells on a worksheet;</td>
<td>worksheet;</td>
</tr>
<tr>
<td>Show all formulas or see the locations of</td>
<td>Show all formulas or see the</td>
</tr>
<tr>
<td>all formulas on a worksheet;</td>
<td>locations of all formulas on a</td>
</tr>
<tr>
<td>Insert, edit, delete comments on a</td>
<td>worksheet;</td>
</tr>
<tr>
<td>worksheet;</td>
<td>Insert, edit, delete comments</td>
</tr>
<tr>
<td>Show, hide comments on a worksheet</td>
<td>on a worksheet;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special tools – Macros:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Record a simple macro (e.g. change the</td>
<td>Record a simple macro (e.g.</td>
</tr>
<tr>
<td>page settings);</td>
<td>change the page settings);</td>
</tr>
<tr>
<td>Run a macro;</td>
<td>Run a macro;</td>
</tr>
<tr>
<td>Assign a macro to a custom button on the</td>
<td>Assign a macro to a custom button</td>
</tr>
<tr>
<td>toolbar;</td>
<td>on the toolbar;</td>
</tr>
</tbody>
</table>
8. GENERAL TERMS OF USE

Web site www.ITdesk.info is launched by the organization "Open Society for Idea Exchange - ODRAZI" in order to actively promote human right to free access to information and human right to education.

Feel free to copy and distribute this document, provided that it does not change anything in it!

All freeware programs and services listed on the ITdesk Home Web site at ITdesk.info are the sole property of their respective authors. Microsoft, Windows, and Windowsxxx are registered trademarks of Microsoft Corporation. Other registered trademarks used on the ITdesk Home Web site are the sole property of their respective owners. If you have questions about using or redistributing any program, please refer to the program license agreement (if any) or contact: info@itdesk.info.

These sites contain links to other web sites or resources. ITdesk.info team is NOT responsible for the text and / or advertising content or products that are on these sites / resources provided, as is not responsible for any content that is available through them, or the possibility of the inaccuracy of the content. Use links at your own risk. Also, ITdesk.info team does not guarantee:

- that the content of this web site free from error or suitable for any purpose,
- that these web sites or web services will function without error or interruption,
- would be appropriate for your needs,
- that implementing such content will not violate patents, copyrights, trademark or other rights of any third party.

If you disagree with the general terms of use or if you are not satisfied with the sites we provide, stop using this web site and web services. ITdesk.info team is not responsible to you or any third party for any resulting damages, whether direct, indirect, incidental or consequential, associated with or resulting from your use, misuse of this web site or web services. Although your claim may be based on warranty, contract violation or any other legal footing, regardless whether we are informed about the possibility of such damages, shall be released from all liability. Accepting the limitations of our responsibilities is a necessary prerequisite of using these web pages and web services.

Please note that all mentioned software in literature published on ITdesk.info, is stated only for educational or exemplary purposes and that we, in any case or manner, do not prefer these software over the other, similar software mentioned or not mentioned in materials. Any statement that would suggest that we prefer some software over the other, mentioned or not mentioned in materials, will be considered as false statement. Our direct and unconditional support have only open source software that allows users to become digitally literate, use computer and participate in the modern information society without barriers.
Publisher:
Open Society for Idea Exchange (ODRAZI), Zagreb