ΜΥΥ106 - Introduction to computer science
1st Lab

1 Part A΄ - Desktop environment

As you may have noticed, the graphical environment is different from what you may be used to. The following activities are intended to familiarize you with it.

On computers with the Linux operating system (such as those we have in the Department's laboratories) there are various desktop environments, and we can choose whichever one we like.
In the link below you can see the most popular desktop environments:
https://en.wikipedia.org/wiki/Desktop_environment#Gallery

1.1 Become familiar with the desktop environment

First, notice that the Desktop has the familiar elements, but with a different appearance or in a different position. Take a few minutes to locate the **icons**, the **application menu**, the **pinned applications**, the **open applications**, the **notification area**...

Our first activity will be to customize the graphical environment according to our preferences. Some options will be found in the **Settings** (the gear icon), while other options are in the **Tweaks** application. Locate these items yourself and open them.

In the followind activities 1. to 6., you do not need to give an answer. Simply do what each one asks of you and move on to the next. If you have difficulty, ask the lab assistants for help.

1. Find a way to change the background image. For now, choose one of the ones in the list. Later, you can choose your own.
2. Find a way to enable dark mode, meaning dark windows and menus. Customize the color of the menus to your preference.
3. Most graphical environments allow the use of multiple desktops. Locate this feature on your system. How can we move a window from one desktop to another?
4. What key combination changes your keyboard layout from Greek to English? Switching between languages is usually done with [Alt+Shift] or [Win+Space]. It is not certain which combination works for your account. Find out what works (not by testing, locate it in Settings) and change the combination if necessary.
5. Open two windows, a web browser (**Firefox**) and a word processor (**Libreoffice Writer**). How can we select and copy text from one window to another? There are copy-paste commands from the menu or by right-clicking, but to work more comfortably/quickly/efficiently we prefer keyboard combinations. Find out what these combinations are (if you have difficulty, ask the assistants before proceeding further).
6. Open a **Terminal** window. Try copying/pasting to or from the terminal.

   Notice what happens? The same combinations don't apply in this window (because they mean something else that we'll talk about later). Find out which combinations apply in the terminal (if you're having trouble, ask the assistants before continuing).

- Why waste time with all the above details?
- You will be using this system for years (probably even after graduation). The more familiar you are, the easier your job will be. Some simple tricks (e.g. keyboard shortcuts instead of mouse and menus) make a big difference.

1.2 Applications

For the next activities, we'll need a few more applications. Locate (in the pinned apps or in the app menu) and open the following items:

1. Web browser **Firefox**,
2. Text editor **Pluma**,
3. **Terminal**, and
4. File explorer (**Files**).

Activity 1: In the **Files** application, create a new folder in your personal folder named `myy106`. Inside it, create another folder named `lab1`. Then, in the **pluma** text editor, write your name and your registration number, and save the file in the `lab1` folder with the name `answers-lab1.txt` (do not close the text editor, however, we will need the file to record our answers to the following questions).

1.3 Find / Copy / Save information

For the next activity we will use the applications `pluma` and `terminal`. We will issue commands in the terminal, copy some information from one window to another, and save it in the file `answers-lab1.txt`.

A useful trick to work comfortably is to place windows next to each other and quickly copy the information that interests us:

- We drag the `pluma` window by the title bar and move it to the right side of our screen. When we reach the limit, a colored frame will appear that shows us the space that the window will take up if we leave it there. Maximize, but for half the screen.
- In the same way we place the **terminal** on the left side of the screen.

Now it's easy to copy information from one window to another.

Another trick for easy copy/paste of text (which only works on Linux, however), is this:

- We select the text we want to copy
  (we don't do anything else, we just select it)
- We move the mouse pointer to the point where we want to paste, and click the **mouse wheel** (yes, click... not scroll)

and we paste faster than we've ever known before!!

Activity 2: To become more familiar with the environment, we will find information about the computer we are using. We will learn (a) what exactly the operating system is (Windows, Linux, ...), (b) what the distribution is (Debian, Ubuntu, ...) and what the version is (22.04, 24.04, ...), (c) what the computer's processor is (model name) and (d) how much RAM it has (total memory). For all of this, there is a section in Settings where we can see it, but we will prefer to find it with commands that we will give in the terminal:

`uname -a` (for the type of operating system)
`cat /etc/os-release` (for the distribution and release of the operating system)
`lscpu` (for the processor)
`free -m` (for memory)

Copy the information you found (only the ones we want, not all the lines) into the file `answers-lab1.txt`. Also add labels, e.g.

Operating system: ...
Distribution: ...
Version: ...
Processor: ...
Memory: ...

Finally, don't forget to save the file.

2 Part B΄ - Spreadsheets

Often, as part of your work, you will be asked to present some information in the form of a graph (e.g. data from some measurements you have made). A simple way to visualize your numerical data is to put it in a spreadsheet and make a chart with it. For the next activity, you will open Libreoffice Calc.

Not familiar with Libreoffice? No problem! Remember that when you gain academic knowledge, you don't learn to use a specific application. You learn to get your work done using whatever tool you have at your disposal. So you will often need to explore the capabilities of a new application in order to find a way to achieve what you want.

1. Open a new spreadsheet with the **LibreOffice Calc** application and save it in the `lab1` folder with the name "**Instagram Hours**". (File → Save as)
2. Copy the text below and paste it into cell `A1` of the table.

```
Name,Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday
Yiorgos,3,3,2,4,6,6,2
Eleni,5,3,6,4,4,1,1
Panagiotis,0,2,0,0,3,5,5
Konstantinos,2,4,2,3,2,6,6
Maria,0,0,1,4,1,0,6
Nikoleta,4,3,0,0,3,3,0
```

The text you copied is in csv (comma separated values) format, a popular data representation in tabular format, i.e. rows and columns, but also in plain text format.

To paste the data correctly into the spreadsheet, you will need to **set the comma as the separator (delimiter)** in the window that appears.

In the questions below, the hint suggests that you use **right-click** to select the appropriate command from the corresponding menu. Often there are more than one way to achieve the same result.

For example, you could use the **menu** at the top of the window, or the **buttons** on the toolbars.

In **Libreoffice** there is also the option to open the "**Properties**" panel in the right side menu, which has the commands related to the item you have selected at that time.

3. Add another column at the end titled "**Total hours per user**".
   (Add the text to cell `I1`)
4. Format cell `I1` so that the text wraps.
   (Select cell `I1` → Right click → Format Cells → Alignment → Wrap Text Automatically)
5. In cell `I2` use the appropriate function to calculate the total hours of Instagram use during the week.
   (Select cell `I2` → f_x → sum → Number1 ...Select Area [SUM(B2:H2)]→ OK)
6. Copy the formula to the next cells in the column to calculate the total hours of Instagram use for all students.
   (AutoComplete: Select `I2` → Move the mouse pointer to the lower right corner of the cell → The pointer becomes a cross → With the left click pressed, drag to the cells where we want the formula to be copied, or double-click on the cross)
7. Add another column titled "**Average Usage Per Day**".
   (Add the text to cell `J1`)
8. Format cell `J1` so that the text wraps.
9. In cell `J2` use the appropriate function to calculate the average number of hours of Instagram usage per day. (AVERAGE function)
10. We want the result to be a decimal number with 1 decimal digit.
    (Select cell → Right click → Format Cells → Numbers → Decimal digits 1)

11. Copy the formula to the next cells in the column to calculate the average Instagram usage for all students.

12. After the last row, add a new row titled "**Total hours per day**". (Add the text to cell `A8`)

13. Using the appropriate function, calculate the total hours per day for the entire week. (SUM function)

14. Add another row titled "**Minimum number of hours**".
(Add the text to cell `A9`)

15. Using the appropriate function, calculate the minimum number of hours of Instagram usage per day. (MIN function)

16. Add another row titled "**Maximum number of hours**".
(Add the text to cell `A10`)

17. Using the appropriate function, calculate the maximum number of hours of Instagram usage per day. (MAX function)

18. Using `Ctrl`, select the range from `B1` to `H1` and from `A9` to `H10`. Then create a Line chart containing the maximum and minimum number of hours of Instagram usage per day. Insert → Chart → Line → Data Range (Select data range) → Data series (Select categories) → Chart Elements (Title, Subtitle, X Axis, Y Axis).

    (α′) Give titles for the x, y axes as well as for the chart.

    (β′) Format the chart (Format Axis, Format Data Series, Format Wall).

    (γ′) Move it to a new worksheet. (Select chart - left click on the chart and green squares will appear around it → right click, in the menu select Cut → create a new worksheet (Sheet→ Insert Sheet) → Paste to the new sheet.

    (δ′) Export the chart as an image (Select chart → Right click→ Export as Image).

19. Create a Column chart containing the weekly average Instagram usage for each student (Insert Chart → Column → Data Range → Data series Add, Data Ranges, Y-values J2:J7→ Title, Subtitle, X Axis, Y Axis).

    (α′) Give titles for the x, y axes as well as for the graph.

    (β′) Save the graph in a new worksheet Graph2.

    (γ′) Export the graph as an image.

20. Create a Pie chart containing the number of hours of Instagram usage for each student on Sunday.

    (α′) Format the chart so that the category labels are shown as a percentage. (Select Pie → Right-click → Insert Data Labels and then Format Data Labels → Show value as percentage).

    (β′) Give the chart a title.

    (γ′) Save the chart in a new worksheet Chart3.

    (δ′) Export the chart as an image.

When you have completed all the questions, ask the lab assistants to check your records and help you correct any deficiencies.

Don't forget to save the Instagram Hours file at the end.

Submit Answers: Click on the link below to open the form to submit your answers. **Copy** all the contents of the file `answers-lab1.txt` and **paste** them into the corresponding box (**Ctrl+A** to select all).
https://forms.office.com/e/HNRXQJmv0n

Close all windows and log out (**Log Out**) from your account.