MYY106: Introduction to Computer Science
9th Lab

Christmas mood

For those who were unable to see snow on their screen in the previous lab, the command for **xsnow** is:

```
user@host:~$ /usr/games/xsnow &
```

Introduction

In this lab we will become familiar with the document creation language LaTeX which provides a powerful automatic typesetting system (and which is not pronounced "latex", the correct pronunciation is "la-tech").

When we submit an article for publication, we are usually provided with a **latex-template** that defines the format of the text. This way we can focus only on the content. If we need to change the formatting for another journal, we simply use a different template without changing the text.

1. Create the directory **lab9** inside the directory **~/myy106/**, go inside it, and download (with **wget**) the file **https://www.cse.uoi.gr/~myy106/files/lab9-files-en.tar.gz** . Unzip it (with **gunzip**) and unpack it (with **tar**). A directory named **lab9-files-en** will be created which will contain, among other things, the file **lab9-template-en.tex**.

2. Copy the file **lab9-template-en.tex** from the **lab9-files-en** directory to the **lab9** directory, and at the same time change its name to **lab9.tex** (we want to keep the template intact, in case we need to start from scratch).

3. Open the file **lab9.tex** with the text editor **TeXstudio** (it is a text editor that provides a complete LaTeX IDE with the ability to build and live preview the **.pdf**).

   

   When you open **.tex** files by double-clicking them from the **Files** application, they load into **gedit**, a simple text editor. To set **TeXstudio** as the default application, **right-click** the file → Properties → Open With → select TeXstudio → Set as Default.

4. Take a look at the code in the file **lab9.tex**. You don't need to study it thoroughly. Just look for LaTeX fields that you are familiar with from the lecture slides.

5. Press the **F5** key on your keyboard to **Build & View** your file. Congratulations!! You just built...

   

   What? It didn't work?
   Take a look at the comments of the .tex file... it tells you something about the compiler.
   Read the instructions and try to fix the problem yourself.

   

   The default **compiler** for LaTeX is **PDFLaTeX**. However, we will not use it today, because it does not support Unicode (UTF-8) characters. This results in Greek characters not being displayed correctly.

   To write Greek, we will change the **compiler** and set XeLaTeX as the default.

   After you fix the problem, create the .pdf to see how your document appears.

Content Format

In the `lab9-files-en` directory there is also the file `lab9-final-en.pdf`. Open it and study it. Your goal is to format your own document in such a way that it resembles `lab9-final-en.pdf` as much as possible.

A simple search on the internet will find everything you need to know about writing commands in LaTeX, as there are plenty of guides and tutorials. You can search for either general categories of commands (e.g. `"LaTeX math"`) or something very specific (e.g. `"LaTeX rightarrow"`). Usually the commands belong to external packages, which you have to import into your .tex file with `\usepackage{...}`.

6. For mathematical expressions, consult the `math` environment. Find out how to express the `sum` and the `fraction`. Also note how the index (`subscript`) and the exponent (`superscript`) are declared.

7. For lists, see what options the `itemize` and `enumerate` commands have.

8. For images, explore the `figure` package.
   To create Figure 1, you will use a drawing program such as `LibreOffice Draw`, which can export files in `.eps` or `.pdf` format that you can import into LaTeX as images.

   After opening `LibreOffice Draw`...

   (α′) In the properties in the right panel, select the page size to `A6` (page format),

   (β′) select the page orientation to `landscape`,

   (γ′) insert the shapes (to fill the page),

   (δ′) export to `.pdf`, and then in LaTeX load it as an image.

   

   We can of course import `.png` or `.jpg` images as well, but we prefer `.eps` or `.pdf` images which can contain vector graphics, and maintain quality at any scale, while `.png` and `.jpg` are imported as bitmaps (raster graphics) and lose quality when enlarged.

9. For tables, see the command `tabular`. Study the table in the file `lab9-final-en.pdf` and observe.
   - How many columns does the table consist of?
   - What is the alignment of each column?
   - In which rows of the table are there dividing lines (horizontal borders)?
   - In which columns of the table are there dividing lines (vertical borders)?

   Based on what you observed, create the table of `lab9-final-en.pdf`.

10. Note that the table appears before Figure 1, even though the figure comes earlier in your code. Why does this happen? Examine the properties of `\begin{figure}[h]`. What does this `[h]` mean? What other options are available? Try each of them and observe how the position of the figure changes each time.

11. To format the code within the text, use the `listings` environment.

    The code already contains the necessary commands that determine the appearance of the text (lines 24 to 46). Remove the comments from the beginning of each line to activate them.

    Then take the `bash` code from `lab9-final-en.pdf`, and copy it into your own `.tex` file. Place the commands within the `lstlisting` environment, using the following settings, exactly as they are given.

    ```
    \begin{lstlisting}[style=bashstyle, numbers=left, caption={A Simple Bash Script}]
        ...
    \end{lstlisting}
    ```

LaTeX is a powerful tool for writing scientific text. Once you learn it, each of your publications (technical reports, articles, papers, or even your thesis) will gain professional prestige, while you will save time, have full control over formatting, and produce complete and well-structured material. By learning it, you will acquire an essential skill with value in any academic or technical environment.

Submit answers: Paste the **contents** of the file `lab9.tex` into the corresponding box of the form https://forms.office.com/e/HNRXQJmv0n