In-Class Work: Latex & Xfig

The following steps walk you through **Latex**, which provides THE tool for writing scientific papers, especially when formulae and equations are involved. I will walk you through steps 1.-3.

1. Sample File(s)

Copy
`~kvollmay/classes.dir/capstone_s2011.dir/papers.dir/template_caps2011.tex`
`~kvollmay/classes.dir/capstone_s2011.dir/papers.dir/samplefig1.eps`
`~kvollmay/classes.dir/capstone_s2011.dir/papers.dir/samplefig2.eps`
into your working directory. Have a *quick* look at `template_caps2011.tex`.

2. Compile

The `template_caps2011.tex` contains the "commands" and they need to be converted to something you can look at. Type (on the command line):
`latex template_caps2011.tex`
Check with `ls` that the file `template_caps2011.dvi` was created. You can look at the document with
`xdvi template_caps2011.dvi &`
This opens a new window with the document as it will look when you print it. You do not have to redo this `xdvi` command each time when you change the tex-file and recompile the tex-file, instead this window will get updated whenever you recompile (use `latex` command).

3. Make Printable File

Next we make out of the dvifile a file which you can print. Type
`dvips template_caps2011.dvi -o`
(In case of wanting only a few pages of the document you may use
`dvips -p1 -n1 template_caps2011.dvi -o`
where `-p1` specifies the starting page and `-n1` specifies how many pages you want to include in your psfile.) This creates `template_caps2011.ps`. And you can print this psfile with
`lpr -Pbert12-lp1 template_caps2011.ps`
To look at this psfile before you print it use `evince template_caps2011.ps` [1]
If you want instead a pdf-file, you may use `ps2pdf template_caps2011.ps`
which creates `template_caps2011.pdf` and you can look at the resulting pdf-file with `acroread template_caps2011.pdf` or with `xpdf template_caps2011.pdf`.

4. Title and Sections

Copy `template_caps2011.tex` into a tex-file which you will use to write your paper. In this file change the title (search for `\title`). Use `xdvi` to look at the resulting document. Next change the sections (`\section`) and make more than one section by using the command multiple times.

5. Formulae

Next look at the equations Eq.(1) and Eq.(2). Try modifying these equations to the equations for the model of your project. Check with your xdvi-viewer.

[1] Depending on the software of the computer you are using, you may use instead `ghostview template_caps2011.ps`

6. References

Type in next at the end of the tex-file the references of your bibliography. Each reference starts with `\bibitem{}` where `{}` corresponds to the label for each reference.

Info: For more information please note on our webpage the link "Computer Tools (PHYS Junior Lab)" and google for specific latex questions (or just ask me).

The next steps will guide you through basic command of the drawing tool **xfig**.

7. Xfig Intro

I will guide you trough the following main commands:

- To get started: Type on the command line: `xfig &`
  This will open a new window.
- drawing tools: background grid, circle, line, text, picture, grouping, scaling, copying, editing.
- To save an xfig session use `File` → `SaveAs` and give your xfig-file a name ending with `.fig`. You can get back to this session any time on the command line with `xfig filename.fig &` or within xfig with `File` → `Open`.
- To make an eps-file out of your figure use `File` → `Export`, make sure to choose "EPS (Encapsulated Postscript)" and choose the same filename but with the ending `.eps`. This eps-file can then be included in your latex file for the paper. (Later into the course I will also show you a variation of latex, latex beamer, which we will use to make talk-slides. You will be able to use the same eps-files for the paper and for the talk and therefore your work on the eps-files for your paper will be very handy for your talk preparation.)

Comment to advanced xfig users: In case you would like to use latex commands within xfig, please use the link on our capstone course web page "Computer Tools (PHYS329/330 Junior Lab)". In the section for xfig use the link "Using LaTeX using xfig" and on that page go all the way to the last section "How to use LaTeX within xfig - Perl Script Option". Use xfig2eps. [2]

8. Figure(s) for Model Section

Work on the figure(s) which you will use for the model section and/or background section of your paper. Even if your figure is not finished yet, safe the fig-file and make an eps-file of your figure and include it in the tex-file of your paper.

[2] KVLnotes: (1) `xfig -specialtext -latexfonts -startlatexFont default`
(2) first save then export to "Combined PS/LaTeX (both parts)."
(3) `xfig2eps filename` or `xfig2pdf filename`