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. (For some of you this might be a reminder.) You can use Latex in the Linux environment (steps 1A. and 2A.) or you can use the webpage based interface Overleaf (steps 1B. and 2B.).

Latex Within Linux:

1A. Sample File(s)

Copy into your working directory the following files:
`~kvollmay/share.dir/papertools.dir/templateWithBib.tex`
`~kvollmay/share.dir/papertools.dir/myRefs.bib`
`~kvollmay/share.dir/papertools.dir/samplefig.pdf`
`~kvollmay/share.dir/papertools.dir/cubic.pdf`

Have a <u>quick</u> look at `templateWithBib.tex`

2A. Compile, Look at Paper, Print Paper

The `templateWithBib.tex` contains the "commands" and they need to be converted to something you can look at. Type (on the command line):
`pdflatex templateWithBib.tex`
`bibtex templateWithBib`
`pdflatex templateWithBib.tex`
`pdflatex templateWithBib.tex`
This should have created `templateWithBib.pdf` which you can look at with any pdf viewer. In the linux environment for example with
`atril templateWithBib.pdf`
and then you can also print your `templateWithBib.pdf`.

This information on how to compile and view the template-paper, you find also at the beginning as comments of `templateWithBib.tex`

Latex Overleaf:

1Bi. Copy zip-file: Download or copy into your working directory the following file:
`~kvollmay/share.dir/papertools.dir/templateWithBibAll.zip`

1Bii. Register at Overleaf:
This step you have to do only once. (So if you already are registered, please skip this step.) Go to
`https://www.overleaf.com/`
and register. Remember your username and password.

1Biii. Log Into Overleaf: Go to
`https://www.overleaf.com/`
and on the top right click on LogIn. Use the same credentials you used when you registered.

1Biv. Upload a New Project: On the top left click `NewProject` and then `Upload Project`. Select the file `templateWithBibAll.zip`.

2Bi. Edit Project: Click on the Project and you will find both, on the left you can edit the `templateWithBib.tex` and on the right it gets automatically compiled. [2]

2Bii. Copy Project: To make copy of the template project for your own project, click on the left arrow, then on the right side of TemplateWithBib click on on the second symbol, which is the copy symbol. It offers you to rename the project right then.

2Biii. Upload Single File: To upload a single file while working on a project, click on one of your files (on the left on the three dots, then choose `NewFile`, then `Upload` and then `Select`.

2Biv. Download project To download the source files of a project, go to `Menue`, then click on `Source`. That will download a zip-file. It might end up in your `~/Downloads/`. You can copy the downloaded zip-file, let's call it `file.zip` and copy this file into the directory you want to use it. You can unpack this file with
  `unzip file.zip`.

3. Title and Sections

In Overleaf in your own project (copied), or in linux environment copy `templateWithBib` to a tex-file (with a different name) which you will use to write your paper. In this file change the title (search for `\title`). Look at the resulting document. Next change the sections (`\section`) and make more than one section by using the commanud multiple times.

4. 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 the resulting pdf-file. See below where you can get more information.

5. References

You can add references to `myRefs.bib` and then cite them in `templateWithBib.tex` with `\cite`.

6. Xfig Intro (if time)

I will guide you through the following main commands of `xfig`, which is drawing tool:

- 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

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[2]If you like to use vim as your editor, select the project you want to edit, then click on the top left on `Menue`, then scroll down to keybindings and select `vim`

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.)

7. (optional) Comment for Advanced xfig Users:

In case you would like to use latex commands within xfig use the following steps: First copy
`~kvollmay/share.dir/papertools.dir/xfig2eps`
and
`~kvollmay/share.dir/papertools.dir/xfig2pdf`
then make both executable (these are perl-scripts)
`chmod u+x xfig2*`. These `xfig2*` files will be needed for step (3) below.

Instead of `xfig` use instead
(1) `xfig -specialtext -latexfonts -startlatexFont default`
(2) first save then export to "Combined PS/LaTeX (both parts)."
This creates two files: `filename.pstex` and `filename.pstex_t` . To then make an eps-file (which you can include in your paper) (3a) `xfig2eps filename`
or to make a pdf-file use
(3b)`xfig2pdf filename`

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 first paper.