SAMBa Worksheets

Please complete these worksheets before the Friday of induction week.

> **★ Prerequisites**
>
> Your undergraduate training.

Schedule

Approximate time to spend on each of the exercises:

0:30	LaTeX (./01_latex-ws.html)	Quick LaTeX document to produce
1:00	Python (./02_python-ws.html)	Image processing in Python
1:00	MATLAB (./03_matlab-ws.html)	Finite differences in MATLAB
0:30	R (./04_R-ws.html)	Statistics in R

Try and complete as much as you can.

Setup

You will need access to the programming languages for each course. They are worth having as they will be used in the subsequent courses. A guide for using/installing all the software cannot be provided here, but some helpful hints are given below.

The jupyter notebooks are available here (../notebooks_rendered), and pdfs of the worksheets are available here (../pdf).

LaTeX

To install LaTeX on your own machine follow the guide here (https://www.latex-project.org/get/).

If you can't install on your own machine for whatever reason you can use Overleaf (https://www.overleaf.com/), which is an online tool for producing LaTeX documents.

Python

To install Python on you own machine follow the guide here (https://www.python.org/downloads/), although you may wish to use Anaconda (https://www.anaconda.com/download/). Be sure to get **Python 3**, which is not backwards compatible! Some projects are still using the older Python 2, it is recommended to use Python 3 as support will soon be dropped for Python 2.

If you can't install on your own machine for whatever reason, you can try uszing a Microsoft Azure notebook (https://notebooks.azure.com/), which is accessible if your institution uses Microsoft's system and has enabled Azure. Once loaded start a new Python 3 notebook.

MATLAB

MATLAB is commercial software, and although the university have a site licence, it is not possile to distribute a copy before the start of the course. If you have access to MATLAB on your own machine, use this. If not Octave (https://www.gnu.org/software/octave/) promises to be a free alternative, and you should be able to complete the exercises, using that.

R

To install R on your own machine follow the guide here (https://www.r-project.org/). You may find it more useful to use the R-studio (https://www.rstudio.com/products/rstudio/download/#download) environment, which is free commercial software.

If you can't install on your own machine for whatever reason, you can try uszing a Microsoft Azure notebook (https://notebooks.azure.com/), which is accessible if your institution uses Microsoft's system and has enabled Azure. Once loaded start a new R notebook.