Coding in C at Home

Part 2 Computational Physics

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THE UNIVERSITY OF

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1   Introduction

This document gives a quick overview of how to go about compiling and running C code at home.

You are not expected to do any coding outside of the lab sessions. Even so, this might be useful for those of you that want to have a head start playing around with some of the code before a session, want to continue at home after the session is complete, or are curious and want to continue coding in C after the end of the course.
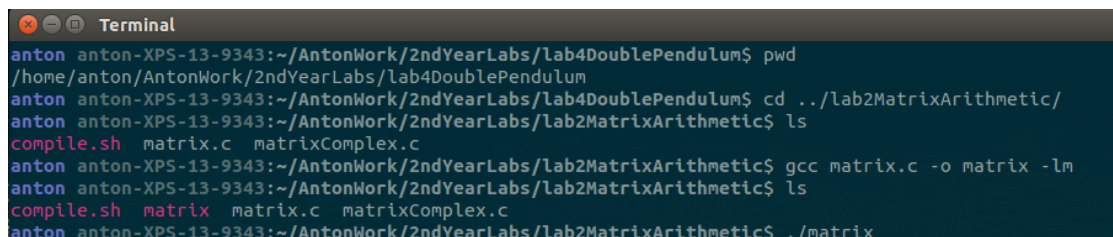
2 Linux

Coding in Linux will be the easiest as your Linux distribution should come with the C compiler **gcc** and all the relevant libraries already installed.

The computers in the lab sessions are running the Ubuntu distribution, and any of you running Linux at home will probably be running Ubuntu or an Ubuntu-like version of Linux. These instructions should be valid for those of you running another Linux distribution.

To run the code:

1. Write your code in an editor of your choice (kate, sublime, atom, vim; the list goes on..) and save it with a .c extension (e.g.: `myCode.c`).

2. Open up the terminal in the directory in which you saved your code. If you are not in the correct directory typing
   `pwd`
   and pressing enter will tell you where you are. Then navigate to the correct directory using `cd`, e.g.:
   `cd Documents`
   will take you into the directory named Documents, assuming it exists where you currently are. Meanwhile
   `cd ..`
   will take you up a level. To view a list of the files and directories in your current location enter the command `ls` .

3. Enter the command
   `gcc myCode.c -o myCode -libraries`
   where `-libraries` would be *-lm* for math libraries or *-lcpgplot* for plotting. This creates an executable named `myCode`.

4. Run your code! Enter `./myCode`

Here's the commands written in a terminal:

Note: Check the first week lab notes for more detailed information.

3 Mac OS X

Luckily, Mac OS X is somewhat similar to Linux. After some quick set up, follow the same commands as given above.

For those of you running Mac OS X 10.9 or newer do the following (Otherwise google how to install command line tools or Xcode on your version)

1. Open up the launchpad and open up the terminal.

2. Enter `xcode-select --install` and press enter.

3. A window will pop up; select install to just install the command line tools (without installing all of Xcode).

4. Done. Now follow the instructions for Linux distributions to get coding!

4 Windows

Throughout this course we use the C build of PGPLOT (`cpgplot`) to do all of our plotting. There is no easy way of getting this to work on Windows so you will need to do all of your plotting on a Linux machine (i.e.: during the lab sessions). Everything else should work fine.

The easiest way to write, compile and run C code on windows using the gcc compiler is to download *Code Blocks*:

1. Download *Code Blocks* directly from
   `http://sourceforge.net/projects/codeblocks/files/Binaries/16.01/`
   `Windows/codeblocks-16.01mingw-setup.exe`.
   (This will automatically start the download)

   Alternatively:

   (a) Go to `http://www.codeblocks.org/downloads/binaries`

   (b) Select the Sourceforge.net link corresponding to codeblocks-16.01mingw-setup.exe. (note the MinGW, this is important so as to get the gcc compiler built in).

2. Double click on the executable to begin the installation.

3. Select all the default options. Make sure that any options related to MinGW or gcc are selected to be installed (you might get the option to select a different compiler or no-compiler as the default, make sure the gcc compiler option is selected).

4. Run codeblocks and create a new project. For our uses this will just be a directory.

5. Create a blank `.c` document (should be the left most option on the toolbar).

6. Input your c code, and when ready select "build and run". This should bring up a terminal like window with any text output from your code.

Search online for any further information or any issues. There are plenty of instructional materials (including how to install and run CodeBlocks videos on youtube) and all common issues should have solutions just a google away.