

Installing Linux/Emacs/GCC/R/ESS

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Prerequisite

An Internet connection. You need to make sure that you're connected when trying to install, update etc.

Installing Linux

- On MacOS you do not need Linux, because MacOS is a form of Unix.
- On Windows:
 1. From the search field, open the **PowerShell** and enter `WSL --install` at the prompt.
 2. Execute the following command on the Ubuntu shell:

```
sudo apt update -y && sudo apt upgrade -y
```
 3. Reboot your computer.
 4. You'll need to pick a username and a (simple) password. You can change the password easily enough later with the `passwd` command.
 5. For the next steps, make sure you're opening the Ubuntu shell, and not the PowerShell. Save the icon to your Taskbar.
- On an Android phone: Get F-droid and download Termux, a full Linux simulator on your phone.

Installing Emacs and GCC

These tests will run provided you have the following applications available (installation instructions work under Linux only):

- Emacs (editor):
 1. Executable: `emacs`
 2. Check with: `emacs --version`
 3. Install with: `sudo apt install emacs`
 4. Configure: `wget -O .emacs tinyurl.com/lyon-emacs`
- GCC (compiler)
 1. Executable: `gcc`
 2. Can install with `sudo apt install gcc`
 3. Check with `gcc --version`
- Note that you can also get Emacs/GCC and bash for the tests below in a Windows environment, but then the installation is rather painful.

C Test

- You should be able to create a code block with the keyboard sequence `<s TAB` - if this does not work, you did not install the configuration file `.emacs` properly:
 - The file may be in the wrong location: It should be at `~/.emacs`
 - The `wget` command may have failed because of a typo (the flag is `-O` and the `O` is Big-Oh as in "Otto").
- Hello world program:

```
printf("Hello, world!\n");  
  
Hello, world!
```

C++ Test

- Hello world program:

```
std::cout << "Hello, world!" << std::endl;
```

Shell test

The following program generates an input file as stdout, and the C code reads the file as stdin:

```
echo Marcus > input
cat input

char name[100];
fgets(name,sizeof(name),stdin);
printf("Hello, %s\n", name);
```

Tangle and weave

- Tangle hello.c with `C-c C-v t` (or `M-x org-babel-tangle`)
- You can now view the file here:

```
cat ./hello.c
```

Learning Emacs and Org-mode

- Emacs has an on-board tutorial that takes about 1 hour to complete - you can start it inside the editor with `CTRL + h t`.
- In addition, I have created a shorter tutorial, and made two videos showing how it all works: Part I and Part II. The tutorial itself is here on GitHub.

Installing R and Python (advanced)

You need this for data science courses.

- On Linux, you already have Python! Try `python3 --version` to check.
- Open the Linux terminal
- Enter `sudo apt install r-base -y`
- Test R on the terminal by entering ‘`R --version`’
- Open Emacs

- Open the package list with `M-x list-packages`
- Find ESS with `C-s ess`
- Add it for installation with ‘i’
- Install it with ‘x’
- Open an R console with `M-x R`
- Create a new file with `C-x C-f Rtest.org`
- Create an R code block with `<s TAB R`

Run these commands in the code block

```
head(mtcars)
```

Create a graphic code block and plot something:

```
#+begin_src R :file test.png :results file graphics output
  plot(mtcars)
#+end_src
```