

Spring 2022 courses

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Tutorial videos Spring 2022

DONE Installation of Emacs on your PC (with PATH setting)

The video covers finding relevant FAQs on GitHub, download and install on Windows/MacOS, and setting the search `PATH` so that your PC can find Emacs from anywhere (e.g. the CMD line/terminal).

- [FAQ on GitHub \(checklist\)](#)
- [Video Emacs for Beginners 1: Installing Emacs](#) on YouTube (9'30")
- Test installation:
 - Open Emacs from desktop (double-click on shortcut)
 - Open Emacs from the terminal at the prompt with the command `emacs`
 - Shut it down again with `C-x C-c` (or close the window).

The next step here is to install an initialization file `.emacs` - that's part of a separate video.

This video is part of a [YouTube playlist "Emacs for Beginners"](#).

DONE Installing of R on your PC (with PATH setting)

The video covers finding relevant FAQs on GitHub, download and install on Windows, and setting the search `PATH` variable so that your PC can find R from anywhere (e.g. on the CMD line/terminal, but also from within Emacs so that you can run code blocks in Org-mode files - subject of another video).

- [FAQ on GitHub \(checklist\)](#)
- [Video Installing R for Windows](#) on YouTube (8'30")
- Test the installation
 - Open R in a terminal - type `R` at the prompt
 - Open R in an Emacs buffer (with ESS): `M-x R` - then close buffer (confirm `Do you want to close this running process?` with `yes`)
 - Open R inside an Emacs shell: `M-x eshell`, then at the prompt, enter `R --vanilla`
 - To leave R, type `q()` and confirm with `n` (do not save work space).

DONE Installing an Emacs initialization file .emacs

If you want to run code blocks inside Emacs, some customization is necessary. This is done with an

initialization file that Emacs picks up when starting, from the `$HOME` location on your PC.

The video covers download of the `.emacs` file from the web, and opening Emacs with or without it, finding the `$HOME` directory. In another video, I explain how to download Emacs packages with the package manager, and how to change the layout.

- Get the `.emacs` file from the web: <https://tinyurl.com/lyonemacs>
- [Video Emacs for Beginners 7: Initialization with .emacs](#) on YouTube (5'21")
- Test installation: restart emacs - you should see no menu or tool bar at the top (the init file that you just installed contains commands to switch them off).

DONE Installing of GCC on your Windows PC (with PATH setting)

The video covers finding relevant FAQs on GitHub, download and install under Windows, and setting the search `PATH` variable so that your PC can find the C compiler from anywhere (e.g. on the CMD line/terminal, but also from within Emacs so that you can run code blocks in Org-mode files - subject of another video).

- Where to get GCC for Windows: sourceforge.net
- Test installation: open a CMD line terminal and enter `gcc --version`
- [Video: Installing GCC on your Windows PC on YouTube \(7'50"\)](#)

DONE Running a C program inside an Org-mode file

Org-mode allows you to run code in many programming languages inside GNU Emacs. This video shows how to create a simple Org-mode file, define a C code block, run the file inside Emacs, extract C source code from the Org-mode file, and run it on the CMD line terminal. See also: [assignment in GitHub](#).

Conditions: you must have the [GCC compiler MinGW installed](#) and in the `PATH`, and you must have [my .emacs file loaded by Emacs](#).

- Create a working directory with `C-x d` followed by `+` and the name
- Create an Org-mode file (`.org`) with `C-x C-f first.org RET`
- Font change with `C-x C-=` followed by `+` or `-` or `0`
- Meta information always begins with `#+`
- To undo any key sequence: `C-/` (or `C-x u`)
- Org-mode links are surrounded by `[[` and `]`]
- To name the code block use `#+name:`
- Code block begins with `#+begin_src`, and ends with `#+end_src`
- You need to add a header (minimum: programming language, e.g. C)
- Add the statement inside the block
- To execute the code block use `C-c C-c` (with the cursor anywhere inside the block)
- To mark a region, use `C-SPC`

- To follow a link, use C-c C-o

Video: [Run a C program inside an Org-mode file](#) on YouTube (20 min)

DONE Tangling C source code from an Org mode file

Org-mode allows you to tangle (or extract) source code files from code blocks. Watch "Running a C program inside Emacs" before this video, if you don't know how to create a named code block.

- Add header information: `:tangle hello.c :comments both`
- Inside the code block, enter M-x org-babel-tangle (C-c C-v t)
- Open a UNIX shell in Emacs with M-x eshell
- At the command prompt, enter `ls -la` to see all content
- Compile `hello.c` by entering: `gcc -o hello hello.c`
- At the command prompt, enter `ls -la` to see all content
- Execute the file `hello.exe` by entering `hello`
- Open Dired (C-x d) and look at the file `hello.c`

Video: [Tangle C code, compile and run it in an Emacs shell](#) on YouTube (10 min)

DONE Running R code inside an Org-mode file

Org-mode allows you to run code in many programming languages inside GNU Emacs. This video shows you how to create a simple Org-mode file, define a R code block, and run the file inside Emacs. See also: [assignment in GitHub](#).

Conditions: you must have the [R program installed](#) and it must be in the PATH, and you must have [my .emacs file loaded by Emacs](#).

- Create a working directory with C-x d followed by + and the name
- Create an Org-mode file (.org) with C-x C-f first.org RET
- Font change with C-x C-= followed by + or - or 0
- Meta information always begins with #+
- To undo any key sequence: C-/ (or C-x u)
- Org-mode links are surrounded by [[and]]
- To name the code block use #+name:
- Code block begins with #+begin_src, and ends with #+end_src
- You need to add a header (minimum: programming language, e.g. R)
- Add the statement inside the block
- To execute the code block use C-c C-c (with the cursor anywhere inside the block)
- To mark a region, use C-SPC
- To follow a link, use C-c C-o

Video: [Run R Code inside an Emacs Org-mode file](#) on YouTube (11'30")

DONE Tangle R code, and run it in an Emacs shell

Org-mode allows you to tangle (or extract) source code files from code blocks. Watch "Running an R program inside Emacs" before this video, if you don't know how to create a named code block.

- Add header information: `:tangle mtcars.R :comments both`
- Inside the code block, enter `M-x org-babel-tangle (C-c C-v t)`
- Open a UNIX shell in Emacs with `M-x eshell`
- At the command prompt, enter `ls -la` to see all content
- Run the program with `Rscript mtcars.R`
- Open Direx (`C-x d`) and look at the file `mtcars.R`

Video: [Tangle R code and run it in an Emacs shell](#) on YouTube (3 min)

DONE Create and run a shell script inside an Org-mode file

In this video, I show how to create a hello world shell script as an Emacs Org-mode code block, then start an Emacs shell (i.e. inside Emacs) and run the same script there, too.

Conditions: you must have `bash.exe` installed and in the `PATH` of your PC so that it can be found by Emacs. You must have [GNU Emacs installed](#). You must have my sample [.emacs file loaded by Emacs](#).

To install the `bash.exe` shell program, download and install CygWin, a suite of utility programs for Windows [from here](#).

- Make sure you have bash shell: open `eshell` inside Emacs (`M-x eshell`) and enter the command `which bash`. On Windows, you should get the location of the file `bash.exe`
- Create a code source block for the language `bash` in an Org-mode file.
- Add a bash statement: `echo hello world`
- Run the code block with `C-c C-c`. You should see the output.
- Next, create a file `hello.sh` which has in its first line the code `#!/[path to bash.exe]`. Get the `[path to bash.exe]` from the shell with `which bash`.
- Save the file and run it in the `eshell` with `./hello.sh`.

Video: [Create and run shell scripts in GNU Emacs on YouTube](#) (12')

DONE Inserting an inline image in an Org-mode file (and a lot about links)

In the video, you see how Emacs handles links. You can link to any named object - be it a code chunk, a reference, a file, a URL or an image. Not shown: links to files and URLs - same syntax though.

Video: [GNU Emacs links and inline images](#) on YouTube (9'30")

Preliminaries on links

- Below you see a link to a code chunk (`chunk`), and to a reference
- In the next section, we'll look at inline images

1 ([Knuth, 1984](#))

Listing 1:

- References
Knuth

Inline image link

- Open the link to the image 1 with `C-c C-x C-v`

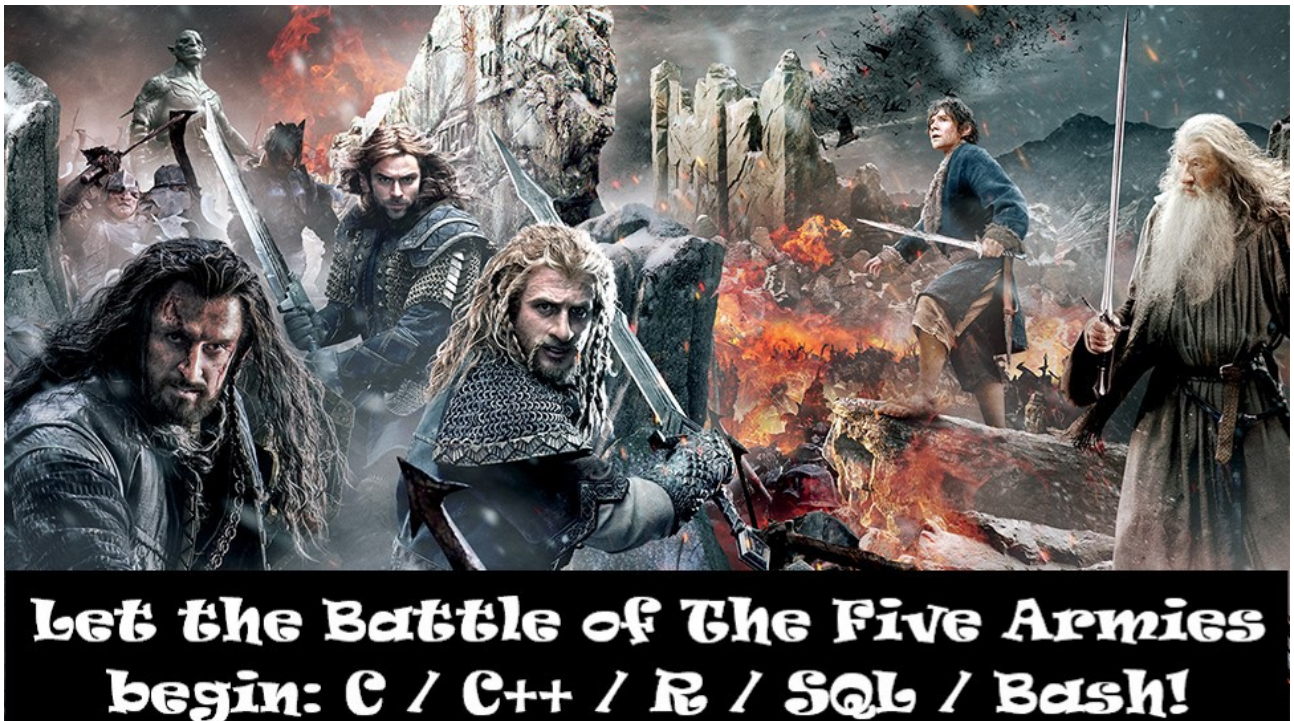


Figure 1: The Hobbit: Battle of the Five Armies (Source...)

- You can embed links to references, files, images, code chunks

TODO Weaving documentation from an Org-mode file and printing it

- To render, use `C-c C-e`
- We can render Org-mode files in many different formats. I use:
 - HTML (In browser)
 - ODT (Open Office - like WORD)
 - LaTeX (for scientific publications and pretty scripts)