



## Exercise sheet 2 – Build C programs

### Goals:

- Build on command line
- ELF structure and commands
- Makefiles usage
- Autotools usage

Update the OS\_exercises repository with `git pull`

```
1 cd ~/Desktop/OS_exercises
2 git pull
```

### Exercise 2.1: Build and run on command line

- Go to OS\_exercises/sheet\_02\_build/1\_hello\_world
- Build `main.c`
- Run the program

### Exercise 2.2: Explore ELF file

*Use your compiled program from the above exercise for this.*

- Find all strings that are contained in the ELF.
- Which sections has the ELF?
- Which symbols are defined?
- Determine the size of the program.
- Strip the symbols of the program.
- Try to list the symbols again.
- Determine the size of the program again? Has something changed?

### Exercise 2.3: Build with a Makefile

- Go to OS\_exercises/sheet\_02\_build/2\_simple\_prog
- Build the program
- Run the program
- Clean the object files
- Can you easily install the program into the system?

### Exercise 2.4: Build with Autotools

- Go to OS\_exercises/sheet\_02\_build/3\_simple\_prog\_automake
- Initialise the build system
- Configure the build



- (d) Explore `configure.ac`
- (e) Explore `Makefile.am`
- (f) Build the program
- (g) Explore the automatically created `Makefile`.
- (h) Install the program
- (i) Run the program
- (j) Set the `-DUSE_SPECIAL_ADD` define
- (k) Create a manpage (you may do a test view directly on the created file)
- (l) Include the manpage into the build
- (m) Build, install, and run again.
- (n) Can you use `man simple_prog`?