

A very short introduction to using the UNIX terminal

- On Linux and macOS: search for the terminal command
- On Windows 10: Don't use the Microsoft "powershell". Instead use the Linux emulation created by Microsoft. Then you will be able to use most UNIX commands on a Windows 10 computer.
- Checkout <https://docs.microsoft.com/en-us/windows/wsl/faq>
- An alternative is to install Linux in addition to Windows.

UNIX terminal on Windows 10

- ① Go to Settings or Inställningar if you use Swedish.
 - If you use English, do as follows:
 - ① Search for Developer mode and enable it. This allows you to run program which do not come from the Microsoft Store.
 - ② Search for "Turn Windows features on and off", and then enable "Windows subsystem for Linux"
 - If you use Swedish, do as follows:
 - ① Search for Utvecklarläge and enable it.
 - ② Search for "Aktivera eller inaktivera Windowssfunktioner", and then enable "Windows undersystem för Linux"
- ② Restart the computer and install the Ubuntu app from the Microsoft Store.
- ③ You will be asked to create a user and assign a password.
- ④ Give the command: `sudo apt-get update`
- ⑤ Give the command: `sudo apt-get install gcc clang gdb`
- ⑥ Sudo means "super user do" which means do something as computer administrator. Use your normal Windows password when asked for the root password.

- You will use the command `cd` on the next slide.
- Directories are used to collect files, such as in Desktop or Downloads
- Go to directory `dir`: `cd dir`
- Go back to previous directory: `cd -`
- Go up to the directory above the current directory: `cd ..`

Windows 10: create directory for your course files

```
cd /mnt/c/Users/YOURNAME/Desktop  
# hashtag starts a comment so don't type this  
mkdir COURSENAME # e.g. EDAF05 or EDAF15  
cd COURSENAME
```

Windows 10: start your favorite editor

- Now start an editor such as Notepad, Atom or Sublime the way you usually do in Windows
- Copy and paste the following C program as the text in your editor.

```
#include <stdio.h>
```

```
int main(int argc, char** argv)
{
    printf("hello, world!\n");
    return 0;
}
```

- Now use Save As, and save the file as `hello.c` in the directory `Desktop/COURSENAME`
- Go back to the Ubuntu window, and type: `ls`
- You should see your C file.
- Next type: `gcc hello.c`
- And then: `./a.out`

Copy files

- `cp original.c copy.c`
- `cp -r dir1 dir2`

File name expansion

- `ls *.c`

Danger alert! Removing files

- `rm badfile.c`
- Warning! This is a very dangerous command which can remove all your files!!!!
- For myself, I normally use a C-program which removes all files that I usually want to get rid of
- When actually using `rm`, think at least one second if this is what you really want! Backup your modified files at least every day.
- If you as administrator type: `rm -rf /`
- Then all files on the computer will be deleted
- `-r` removes subdirectories, and `-f` avoids asking you some questions
- If you type: `rm -rf *.class`
- Then all `.class` files will be deleted
- If you type: `rm -rf * .class`
- Then all your files will be deleted

SSH: secure login from laptop to LTH

```
ssh-keygen -t rsa # initialize once
ssh-copy-id user@login.student.lth.se # upload once to LTH
ssh user@login.student.lth.se # login to LTH
scp -r dir user@login.student.lth.se: # copy dir to LTH
scp -r user@login.student.lth.se:dir . # copy dir from LTH
```

See exact content of a file

```
od -c file
```

```
od -x file
```

Comparing files

```
diff output correct
```

Comparing files

```
if diff output correct
then
echo PASS
else
echo FAIL
fi
```

```
gcc a.c &&  
./a.out < input > output &&  
diff output correct &&  
echo PASS
```

- You can put above line in a text file, say t.
- Then make it executable with the command: `chmod 755 t`
- And then you can type: `./t`

Testing all input files: *.in

```
for x in *.in
do
    echo testing $x
    y=$(basename $x .in)
    scala graph $x > output
    if diff output $y.correct
    then
        echo test failed for $x
        exit 1
    fi
done
```