

# Computersystems and -architecture

## Introduction to UNIX

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## Time Schedule

Exercises are made individually. Put all your files in a tgz archive, as explained on the course's website, and submit your solution to the exercises on Blackboard.

- Deadline: **October 3, 23u55**

## Exercises

Use as few commands as possible. Nearly all exercises can be solved with only 1 command. Fill in all commands you used to solve the exercises in the file `oefeningen.html`.

### 1. Files and Browsing

- Navigate to the root of the file system using the absolute path.
- List all files and directories in the current directory.
- Descend into the directory `usr`. Print the current directory.
- Descend into the directory `bin`. List the file type for all files that start with an `f` in this directory.
- Navigate up to the root directory using a relative path.
- Navigate to your home directory.
- List all files including hidden files.
- Create in your home directory two new subdirectories named `color` and `shape`.
- Navigate to the `color` directory, and create the files `red`, `green`, `blue`, `apple` and `square`.
- List all files in the directory.
- Remove `apple`, as it is not really a color.
- Hide `square` by prepending a dot.
- Edit the remaining files so that they contain their hexadecimal color codes (`FF0000` for red, `00FF00` for green, `0000FF` for blue).
- Copy `blue` to a new file `purple`, and change the contents of the new file to `800080`.
- Rename `red` to `yellow`, and change the contents of the file to `FFFF00`.
- Create a soft link named `darkblue` to `blue`.
- List all files in the directory.

- (r) Edit `darkblue` to `0000A0`.
- (s) Print the contents of `blue`.
- (t) Print the disk size of every file in this directory (*hint: use the wildcard \**).
- (u) Move `.square` to the `shape` directory using the relative path and make it visible again.
- (v) List the contents of the `shape` directory without navigating there.
- (w) Go to the parent directory and remove the `shape` directory.

## 2. Archiving

- (a) Create an archive `color.tar.gz` containing all files in the `color` directory (not the `color` directory itself!).
- (b) Create a new file `orange` with contents `FFA500`.
- (c) Change the file `purple` to `FF0080`, which is a lighter variant of the color.
- (d) Remove the compression of the archive `color.tar.gz` by unzipping it.  
*You have to unzip the archive because updating a compressed archive is not possible.*
- (e) Update the archive `color.tar` to include the new and changed files.
- (f) Gzip the archive `color.tar` again, and make sure the file has a `.tar.gz` extension.
- (g) Remove the `color` directory, but keep the archive.
- (h) Create a new directory `color2` in your home directory, and unzip the archive into that directory. What happened to the soft link?

## 3. Processes

- (a) Navigate to the directory `/usr/games`.
- (b) Run one of the games in the foreground. Kill the program using the keyboard short-cut.
- (c) Run another game in the background. Display the process info and note the process ID.
- (d) Kill the process using the process ID.
- (e) Startup a number of `sleep 60` processes in the background, and terminate them all at the same time using the `pkill` command.

## 4. Streams

- (a) Download the file `http://tiny.cc/cs1names`.
- (b) Unzip the downloaded archive.
- (c) Display the first 30 female names.
- (d) Display the last 25 male names.
- (e) Count the number of lines in both files. Are there more male or female names?
- (f) Search the list for your own name.  
*(Hint: use `grep`)*
- (g) Print all names that contain the letter `q`.
- (h) The name `raf` is not in the list. Append the name using the stream operator `>>`.
- (i) Sort the male names again and write the result to `male-names-sorted`.  
*(Hint: use a pipe and a stream operator)*

- (j) Merge the male and female names into the file `all-names`. Make sure the names are sorted.
- (k) Print the number of names that appear more than once in `all-names`, and are thus suitable for both boys and girls.  
(*Hint: use `uniq`*)
- (l) Store all names that are both male and female names in `unisex-names`.
- (m) Remove duplicate names from `all-names`.
- (n) Update the archive `Names.tgz` so that it contains the updated version of `male-names` and the new files `all-names` and `unisex-names`.
- (o) Use `find` to compile a list of all directories in the system, redirecting the output so that the list of directories ends up in a file called `directories.txt` and the list of error messages ends up in a file called `errors.txt`.