Week1

Introduction

1. Who am I
2. What do we do
3. What can you expect

Weeks	Contents	Q&A
Week1	Command Line Basics	
Week2	Command Line Basics Cont.	TBR
Week3	Other Tools and Shell Scripting	
Week4	Tools for C (and other languages)	TBR
Week5	Algorithms: Sort and Search (and Paper)	
Week6	Paper Continued	TBR
Week7	Network Basics	
Week8	Functional Programming: Haskell and Others	TBR
Week9	Delve deeper into FP (A Real Project)	
Week10	Continue + Q&A + Prepare for holiday 😃	TBR
Week11	Frontend Basics	
Week12	Backend Basics	TBR
Week13	Basic C++ and C++ vs. C	
Week14	Ideas behind Modern C++ and STL	TBR
Week15	Java vs. C++	
Week16	Can we be safer?	TBR
Week17	Algorithms: Dynamic Programming	
Week18	Algorithms: Greedy	TBR
Week19	Design Patterns	
Week20	`Special`	TBR

Uni-Related

1. What will you learn in 1st/2nd term

Course	Contents	Coursework/Exam
Engineering Challenges (ENGF0001)		A video + A bioreactor!
Design and Professional Skills 1 (ENGF0002)	Learn some Python	Tetris + Design a Protocol + Do a project + Presentation + Write a Report
Principles of Programming (COMP0002)	Learn some C + Haskell	Program a bot + Design a Set + Exam
Discrete Mathematics for Computer Scientists (COMP0147)	Set + Function + Group + Discrete Algorithms + Matrix	Two online quizzes + Exam
Theory of Computation (COMP0003)	Logic + Automata	Exam
Object-Oriented Programming (COMP0004)	Java	Web Design + Exam
Algorithms (COMP0005)	Search + Sort + Graph + String	A trading platform + Exam
Mathematics and Statistics (COMP0011)	Complex Number + Calculus + Vector Space + Matrix...	Exam

2. How could we support you
    - Week5: Algorithms: Sort and Search (and Paper)
    - Week7: Network Basics
    - Week9: Delve deeper into FP (A Real Project)
    - Week11: Frontend Basics
    - Week17-18: Algorithms

Logistics

1. How to access the materials?
2. Absence Policy
    - There are no absent policy!
3. How should you use discord?
4. Something about "the messages" in Discord
    - Exchangeable Image File Format

Setting up your environment

1. Links here: Setting up your environment
    - An additional link for C: Install MinGW-x64
2. But more... (why not try vscode?)

vscode

1. What is vscode?
2. How could it empower your development? (a short demo on C/C++, Python (Jupyter), Haskell, Java)

Python

1. Python

C/C++

1. C/C++ from Microsoft
2. `clangd`

Haskell

1. Haskelly (created by UCL students)
2. Haskell

Java

1. Install Language support for Java for Visual Studio Code
2. Maven for Java
3. Test Runner for Java

Other Extensions

1. Better Comments
2. Error Lens
3. Themes: One Dark Pro / vscode-icons
4. Wakatime
5. If you want to learn more tools: Trunk and Vim are waiting for you

Command Line

> This section is inspired by Welcome to Linux command line for you and me!

The following contents are only for Unix-like OS. Some of them are exclusively for Linux.

Shell

1. What is shell and terminal emulator?
2. `date`, `cal`, `tree`, `wc`, `echo`
3. Redirection and Pipes
4. `man` page
    - Read the man page for man-page

Shell Tools

1. If you are using zsh, you can install `oh-my-zsh` via brew
2. Choose a theme (the default is good)
3. Install some extensions
    - `zsh-syntax-highlighting`
    - `zsh-autosuggestions`
    - `git`
    - `colored-man-page`
    - `z`

File-related command

1. `cd`, `ls`, `rm`, `mkdir`, `touch`, `tee`
2. Their advanced options and meanings

- File Permissions
- `chmod`

Useful commands

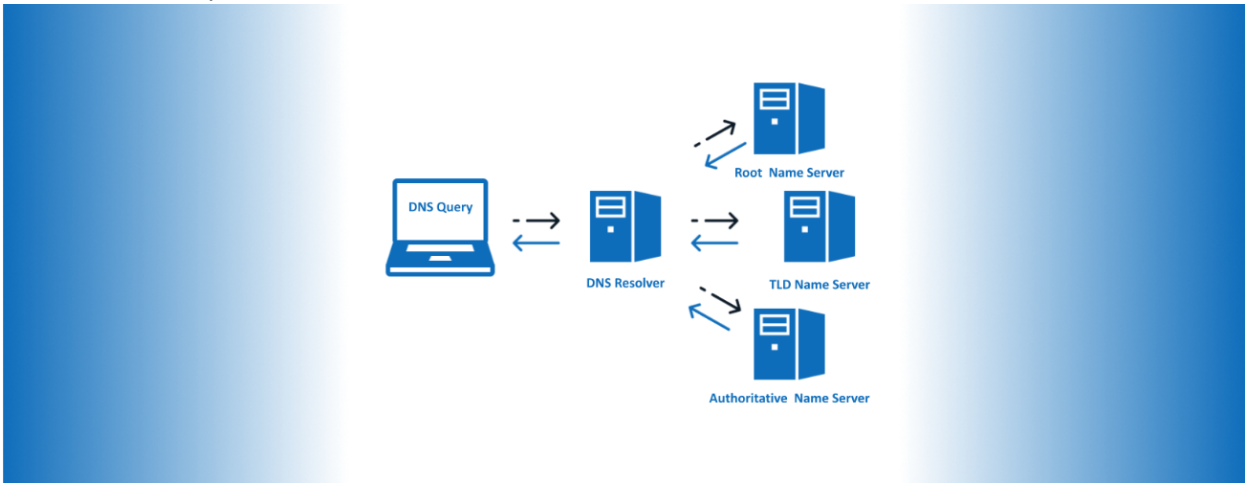
1. Soft Links and Hard Links
   - What are them?
   - How to create them?
2. `tar` files
   - What are `tar` files?
   - Extraction
   - Compression
3. Using `sudo` command
4. Environment variables
   - `PATH`
   - `printenv`
   - shell variables
   - Create/Delete new environment variables ("permanent"/temporary)
5. Sort files by size
   - use `-S` options from `ls`
   - use `sort`
6. Some `!` trick
   - Repeat previous `n` lines
   - Repeat the closest line starts with `x`
   - Repeat the closest line includes `x`

Networking Command (Optional)

> Read this section iff you have some basic Network knowledge.
>
> You can read the first two sections of Introduction to the Domain Name System (DNS) before exploring the following topics.

1. `ping` and `traceroute`
   - What is TTL?
   - How does `traceroute` work?
2. DNS and its lookup rules
   - What happens when we visit a website?

- Recursive Lookup



(from AUTHORITATIVE VS RECURSIVE DNS: WHAT YOU NEED TO KNOW)

- `dig` with example

3. hosts file
   - What is `hosts` ?
   - Path
     - Windows: `C:\Windows\System32\drivers\etc`
     - Mac: `/etc/hosts`

License