# 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 BasicsWeek17-18: 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

- 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**

Parts of this section are excerpted from 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
  - 0 7

#### 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

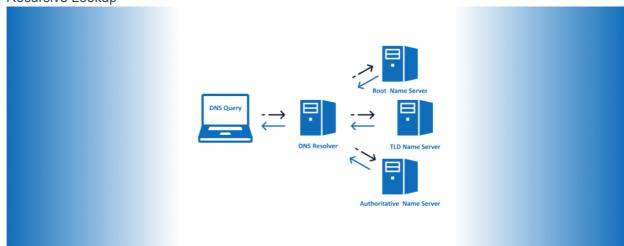
### **Networking Command (Optional)**

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



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

### References

- 1. Welcome to Linux command line for you and me!
- 2. AUTHORITATIVE VS RECURSIVE DNS: WHAT YOU NEED TO KNOW

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