ASE 2023 - 2024 overview

Weeks 1 - 2: Linux literacy, git

Week 1: Working in the commmandline

- basic commands - ls, rm , mv, cp etc
- simple bash scripting
  - variables, loops and control flow
  - functions
  - commandline arguments

Week 2: Intro to git

- concept of version control
- a way to have a backup of your code and all of its history
- distinction between git (the software) and hosting platforms (github, gitlab, self-hosting etc. . .)
- initialising a directory as a git repo
- create git account and set up ssh key
- initialising .git dir and setting upstream url
- add, commit, pull, push
- fixing merge conflicts
- branching
- Rebase
- Cherrypicking

Weeks 3 - 6: Python programming fundamentals

Week 3: Installing conda and managing the programming environment

- downloading miniconda and installing it
- writing an environment.yml file with both conda and pip dependencies
- navigating between virtual environments
- getting VScode extensions for python and ipython

Week 4: basic python programming

- python variables and operators
  - assigning variables (explain the difference between by value vs by reference)
  - lists and list operations
  - dicts and their operations
- python functions
  - functions are first class objects in Python
  - recursion

Week 5: OOP and TDD

- classes and inheritence
- modules and imports
- TDD
  - the unittest class
  - how to write good tests
  - concept of writing tests first, having your program break, and then write code to pass the test

Week 6: Jupyter notebooks

- install Jupyter notebook stuff
- setting things up via vscode
- showing some of the benefits of using this, like visualising plots, using already executed cells as "checkpoints"
- importing python modules into notebooks

Weeks 7 - 12: Deep learning

Week 6 sets us up nicely for the next few weeks as we will almost exclusively be using jupyter notebooks now. These lessons will be identical to the ones covered last year, please check the github repo for details.

Week 7

- introduction to numpy
- basic operations and theory

Week 8

- introduction to pandas
- exercises

Week 9

- intro to pytorch and data loading

Week 10

- basic pytorch classification model

Week 11

- improving the training loop of the basic model

Week 12

- logging, saving and deploying model output