Introduction to the tools we are going to use in this class

vscode text editor

- Extensively used by programmers, data scientist and so on.
- Primarily used to edit **plain text** files
    - These are files composed of characters one after another - there is no formatting or other components.
    - Editors that you are familiar with, such as Microsoft Word are actually more complex documents composed of text, formatting, pictures etc.

Markdown - writing formatted text in plain text

- A way to write formatted text in plain text. Files often end in ".md"
- Examples of markdown:

```
# Header
## Second header

Regular text. __Bold__ text, _italic_ text.
* Itemized values
* Second item
```

Jupyter notebooks

- A way to run small snippets of programs
  - Interactive: You can write code in small chunks (called cells) and run them one at a time.
  - Mix of Code and Text: You can combine code, results, and explanations (using Markdown) all in one place.
  - Immediate Feedback: When you run a code cell, the output appears right below it, which is good for testing and exploring.
  - Visualization: You can display charts, images, and other visuals directly inside the notebook

Jupyter notebooks

- It is the most used tool for AI and data science
- You can run it right away in vscode.
- There are a number of web interfaces that provide variations of it.
- To explore the various AI topics, we are going to use notebooks composed of Markdown text and Python programs.

Some ways to use Jupyter notebooks

- From vscode
  -will run on your computer
- From your browser with a jupyter server running on your computer
  -will run on your computer
- From connecting to Google Colab with your browser
  -code will run on Google's servers
- Other services, editors etc.

Google Colab

- A free, cloud based service provided by Google, to run Python in Jupyter notebooks
- Your notebooks are saved to Google Drive
- Whatever data you are using has to be
    - Either on Google drive
    - Uploaded for the session

Python programming language

- Wait, what?
- **Relax!**
- You don't need to write programs, all the programs will be written for you.
- What you will need to do:
  - Run the programs (super easy)
  - Change the input values and parameters of the program

What you need to know about Python (and programming in general)

- A program is a set of plain text instructions
- In Python, indentation matters:

```
a = 5
if a > 3:
    print("A is bigger than 3")
```

- This means that when you copy a program into your computer you need to make sure that the indentation is retained exactly.
- **Running a program** means making the computer execute the instructions in a program.

Assignments

An assigment makes the value of the variable change to the value after the = sign. We will use this to store data.

```
input = "fido.jpg"
```

Data types

- The data assigned to a variable can be of several types:
  - A number

    -0, 5, or 15.5
  - A yes/no value

    -True or False
  - A string

    -"Hello!" or 'Bye!'
  - A collection of values, such as a list:

    -[1, 2, 3] or ['Cat', 'Dog', 'Bunny']

Comments

- Within the program, there are parts that are marked as comments.
- In python, everything from # to the end of the line is a comment
- These are **not** executed
- You might add comments to programs to remember what you changed

```
input = "mitten.jpg" # was "fido.jpg"
```