

## Tutorial 1

### Exercise 1 (Set theory).

Simplify the following expressions:

(i)  $(\{1,2,3\} \cup \{3,4,5\}) \cap \{3,4\}$

(ii)  $(\{1,2,3\} \setminus \{3,4,5\}) \cup \{3,4\}$

*Solution.*

(i)  $(\{1,2,3\} \cup \{3,4,5\}) \cap \{3,4\} = \{1,2,3,4,5\} \cap \{3,4\} = \{3,4\}$

(ii)  $(\{1,2,3\} \setminus \{3,4,5\}) \cup \{3,4\} = \{1,2\} \cup \{3,4\} = \{1,2,3,4\}$

### Exercise 2 (Git installation).

Install Git on your computer via the official website <https://git-scm.com/downloads>. Ensure that the `git --version` command works in your terminal.

### Exercise 3 (Managing Files and Directories).

Perform the following tasks using your command line interface:

- (i) Create a directory called `python-course`.
- (ii) Change the current working directory to `python-course`.
- (iii) Create a file called `hello.txt`.
- (iv) Write the string `Hello World!` to the file `hello.txt`.
- (v) View the contents of the file `hello.txt`.
- (vi) Search for the string `Hello World!` in the file `hello.txt`.
- (vii) Rename the file `hello.txt` to `hello_world.txt`.
- (viii) Move the file `hello_world.txt` to the directory `Documents`.
- (ix) Copy the file `hello_world.txt` to the file `hello_world_copy.txt`.
- (x) Delete the file `hello_world.txt`.
- (xi) Delete the directory `python-course`.

*Solution.*

```
# (i) Create a directory called python-course.
mkdir python-course

# (ii) Change the current working directory to python-course.
cd python-course

# (iii) Create a file called hello.txt.
touch hello.txt

# (iv) Write the string Hello World! to the file hello.txt.
echo "Hello World!" > hello.txt

# (v) View the contents of the file hello.txt.
cat hello.txt

# (vi) Search for the string Hello World! in the file hello.txt.
grep "Hello World!" hello.txt

# (vii) Rename the file hello.txt to hello_world.txt.
mv hello.txt hello_world.txt

# (viii) Move the file hello_world.txt to the directory Documents.
mv hello_world.txt ~/Documents/

# (ix) Copy the file hello_world.txt to hello_world_copy.txt.
cp ~/Documents/hello_world.txt ~/Documents/hello_world_copy.txt

# (x) Delete the file hello_world.txt.
rm ~/Documents/hello_world.txt

# (xi) Delete the directory python-course.
cd ..
rm -r python-course
```

#### **Exercise 4** (Python installation).

Install Python 3.12 or 3.13 on your computer via the official website <https://www.python.org/downloads/>. Ensure that both `python --version` and `pip --version` commands work in your terminal.

*Note:* Do not use other distributions like from Microsoft Store etc., as they may behave differently in some cases throughout the course.

#### **Exercise 5** (uv installation).

Install uv on your computer via the instructions on the official website <https://docs.astral.sh/uv/getting-started/installation/>. Ensure that the `uv --version` command works in your terminal.

*Note:* Depending on your operating system, you may need to install additional software first like `curl` on Linux. Follow the instructions on the website to install uv and do not use discouraged methods like `pip install uv`.

#### **Exercise 6** (Optional: Vimtutor).

Open the terminal and type `vimtutor`. Follow the instructions to learn the basics of Vim and do, e.g., the first section of the tutorial.