

# COMP1531

## 2.5 - Python - Packages

# Importing libraries

Python comes packaged with a number of standard libraries (e.g. "math"). However, many libraries that you may want to use have to be installed for usage.

Installing is quite easy due to the **pip** program, which makes installations of python dependencies doable in just a single line of code. **pip** is a package installer for python.

# Importing libraries

To use the `numpy` library we need to first install it on our machine.

```
1 $ pip3 install numpy
```

```
1 import numpy as np
2
3 a = np.array(42)
4 b = np.array([1, 2, 3, 4, 5])
5 c = np.array([[1, 2, 3], [4, 5, 6]])
6 d = np.array([[[1, 2, 3], [4, 5, 6]], [[1, 2, 3], [4, 5, 6]]])
7
8 print(a.ndim)
9 print(b.ndim)
10 print(c.ndim)
11 print(d.ndim)
```

# Virtual Environments

A virtual environment is a tool that helps to keep dependencies required by different projects separate by creating isolated python virtual environments for them.

You can read more about them [here](#) and [here](#).

You may be asked a question about them on the exam, but you will never be required to use them.

They are often required for use with CI/CD

# Virtual Environments

Even though we know how to install modules, we now run into a problem:

- How do I easily share the modules that I've installed with my team members?
- How do I ensure my project doesn't end up accidentally using installed modules from other projects, and vice versa?

# Virtual Environments

```
1 pip3 install virtualenv
2 python3 -m virtualenv venv/
3 source venv/bin/activate
4
5 # Do stuff
6
7 pip3 freeze > requirements.txt # Save modules
8 pip3 install -r requirements.txt # Install modules
9
10 deactivate
```