# Getting ready for the tutorial

**First of all: thanks for signup up to this tutorial!**

We'll aim to learn the foundations of **Object Oriented Programming (OOP) through Signal Processing**. We'll explore a real world but simplified domain and modeling using *objects*.

The only requirement to follow the seminar is getting Python installed on your computer.

However, for a more in-depth experience with signals and waves, you'll need a *Jupyter* notebook instance.

You can get it as:

- cloud-based

- local-based

If you already have a Jupyter instance at your disposal, skip to the next chapter.

## Cloud based (preferred)

**Requirement**: have a Gmail account.

Just click here, follow the instructions and you're ready.
Once done, skip to the next chapter.

## Local based

In order to install Jupyter locally, you got two choices:

- install it with Docker (preferred)

- install it in a local environment

### Docker based Jupyter notebook

Once you install Docker (be sure to not use *root* to run docker), just type

```
docker run —name jupyter -p 8888:8888 jupyter/minimal-notebook
```

Point to here and skip to the next chapter.

Please notice that container are stateless: all your code/stuff will be lost when container will be deleted. To avoid this you can:

- download your stuff when you're done, before deleting the container (you can download notebooks and files);

- use binding/volumes

```
docker run —name jupyter -p 8888:8888 -v "${PWD}":/home/jovyan/work jupyter/minimal-notebook
```

The command mounts the current working directory ( `{PWD}` ) on the host as `/home/jovyan/work` in the container, that's where your stuff will be placed to.

Files created inside the container will be persisted to host manchine and viceversa.

Bind mounts syntax could be slight different if you use Windows. Please refer to official Windows documentation.

## Without docker

Follow the instructions here.

Py3 with type hinting support is required to use provided dependencies.

# Install dependencies

Once you have Jupyter ready, install these dependencies.

They are gonna be used to create, visualize and listen to waves.

There are two main types of stuff:

- common libraries:

Open up a notebook and type (the **!** is not a typo, just copy and past the whole command).

This will install those deps inside the notebook and make them usable for the rest of the workshop.

```
!pip install matplotlib numpy
```

- upload the **helpers.py** file; we'll use it throughout the workshop.

- load it into a new notebook

```
%load helpers.py
```

- execute this code snippet: you should see a widget useful to listen to a piano note as well as some chart plotting a line

```
from IPython.display import Audio
import numpy as np
import matplotlib.pyplot as plt

fs = 4410
T = 1.5
t = np.linspace(0, T, int(T*fs))
wave = np.sin(2*np.pi*440*t)
plt.plot(t, wave)
Audio(wave, rate=fs)
```

You need also to upload the wave file into the notebook. We'll use it later for playing with modulation!

Now you're ready to get the best experience from this classroom!

Files to download:

https://s3-us-west-2.amazonaws.com/secure.notion-static.com/38555d33-32ad-4902-91d1-25ffb007ea6d/a-flying-disk-has-been-found_F_minor.wav

https://samplefocus.com/samples/a-flying-disk-has-been-found

https://s3-us-west-2.amazonaws.com/secure.notion-static.com/e898accb-e05e-432e-bcb0-c10e4a6d0ec1/helpers.py