

ObsPy Introduction

A Python Framework for Seismology



Iman Kahbasi

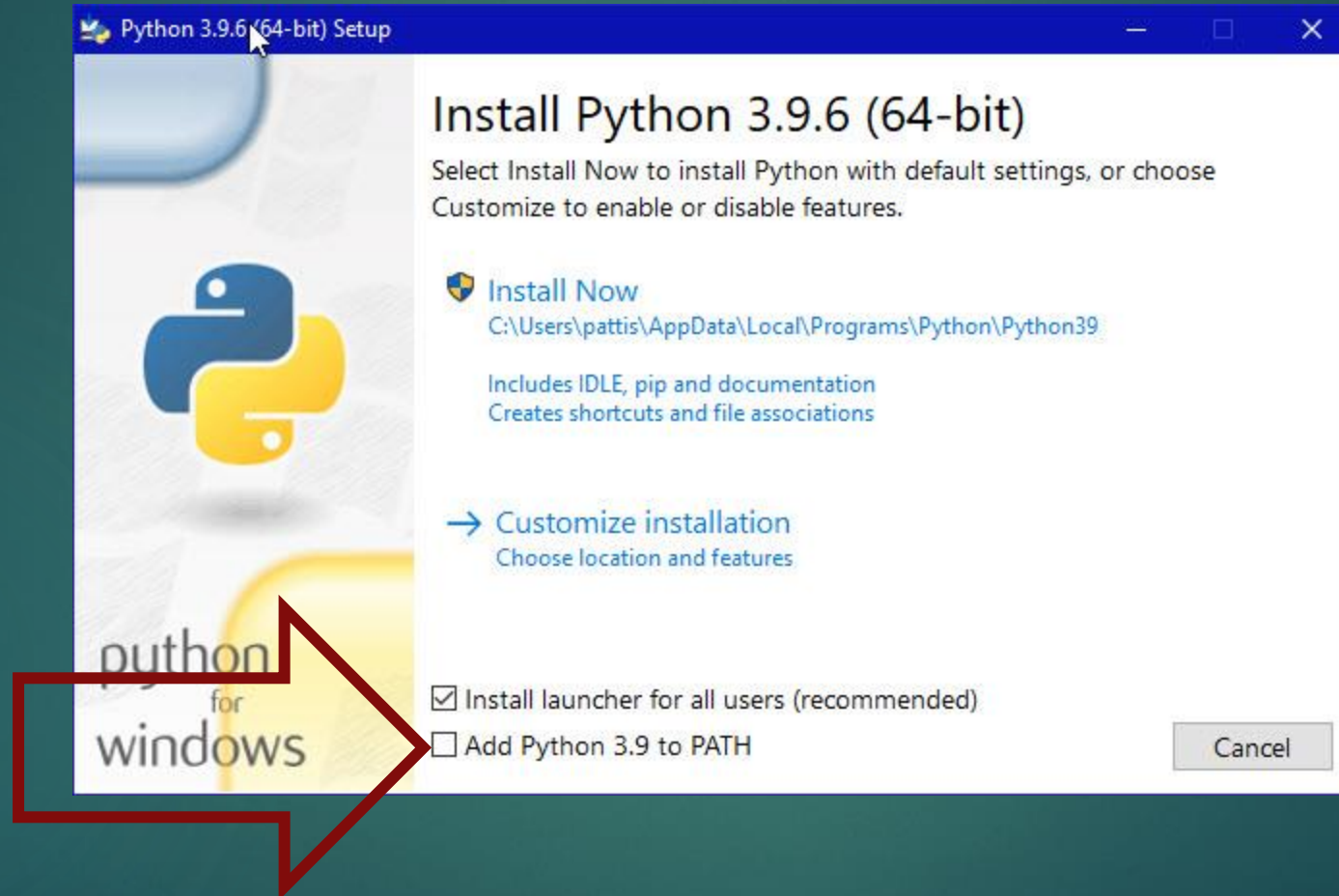
PhD student at IIEES

1400/12/02



<https://www.python.org/>

3



Install module with pip command in cmd

4

- ▶ `pip3 install numpy`
- ▶ `pip3 install obspy`
- ▶ `pip3 install ./path/to/file.whl`

Anaconda

<https://www.anaconda.com/products/individual>

- 1) Linux
 - ▶ `sudo apt install ./Anaconda3-2021.11-Linux-x86_64.sh`
- 2) Windows
 - ▶ double click on exe file
- 3) After installation
 - ▶ `conda config --set auto_activate_base false`
 - ▶ `conda install -c conda-forge obspy`

Types of default objects in python:

- ▶ Integer: 1, 2, 3, ...
- ▶ Float: 1.2, 0.5, ...
- ▶ Complex: 1+2j, complex(1, 2), ...
- ▶ String: "name", '1', "1.2", 'sentences', ...
- ▶ List: [1, 0.2, 'name', ..., [...]], ...
- ▶ Dictionary: {key1: value1, key2: value2, ...}, ...
- ▶ Tuple: (1, 0.2, 'name', ..., [...]), ...



Function & type:

$$\textit{Output} = \textit{function}(\textit{input})$$

$$y = f(x)$$

$$f(x) = \sqrt{x}$$

If $x=4$ find y ?

If $x=\textit{'name'}$ find y ?!

Numpy
<https://numpy.org>

9



NumPy

Matplotlib

<https://matplotlib.org/>

10

matplotlib



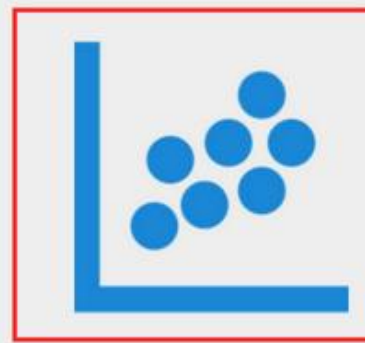
Pie Plot



Area Plot



Bar Graph



Scatter Plot



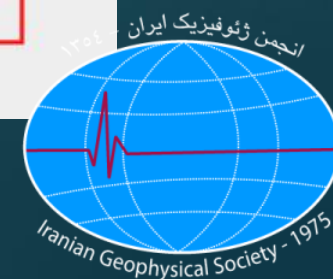
Histogram

MindMajix



ObsPy

A Python Framework for Seismology



How to import and use a function

Method 1

```
>>> from module_name import function_name
```

```
>>> output = function_name(input)
```

Method 2

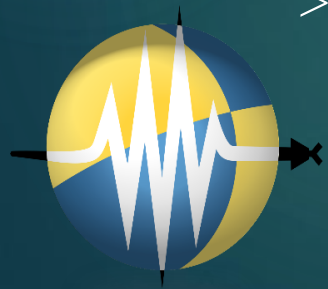
```
>>> import module_name
```

```
>>> output = module_name.function_name(input)
```

Method 3

```
>>> from module_name import function_name as nick_name
```

```
>>> output = nick_name(input)
```



ObsPy

A Python Framework for Seismology

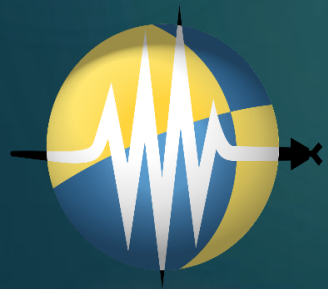
How to find the type of an object in python

12

▶ `>>> type(object)`

or

▶ `>>> type(variable_name)`



ObsPy

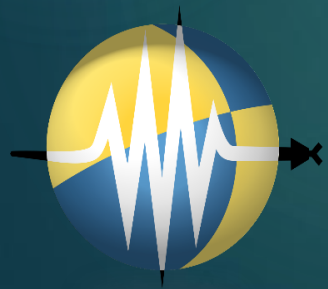
A Python Framework for Seismology



Methods and feature

13

- ▶ `>>> variable_name.<double Tab>`
- ▶ `>>> dir(variable_name)`



ObsPy

A Python Framework for Seismology



IDE (integrated development environment)

14

