KOLT Python

Introduction

Ahmet Uysal

Monday 11th February, 2019

Agenda

1. Program Information
2. Logistics
3. Installations
4. Introduction
5. References

Course Outcomes

- Apply basic programming concepts using Python
- Demonstrate how Python can be used in different areas or disciplines
- Create code that are easy to understand
- **Implement practical challenges** by gaining experience in Python

Why Python?

```python
# Print descriptive text to console and assign input to variable
name = input('Enter a sentence:')
# Greet user
print('Hello from Python,', name)
```

```java
import java.util.Scanner;

public class Example{
    public static void main(String[] args){
        // Create a scanner object
        Scanner scanner = new Scanner(System.in);
        // Print descriptive text to console
        System.out.print("Enter your name: ");
        // Read user input and assign it to a variable
        String name = scanner.nextLine();
        // Greet user
        System.out.println("Hello from Java, " + name);
    }
}
```

Why Python?

- Easy Syntax
- Beginner Friendly -most popular language for introductory CS courses in top universities[1]-
- Wide usage area
- Large and growing community

Some of the Usage Areas[2]

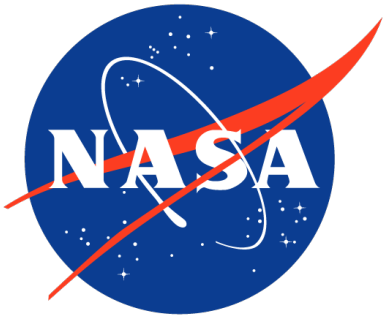
- Data Analysis
- Web Development
- System Administration
- Machine Learning
- Web Parsers/Scrawlers
- Testing
- Education
- Network Programming
- ...

Python at Koç University

- COMP341: Introduction to Artificial Intelligence
- COMP421/521: Introduction to Machine Learning
- ENGR350(Selected Topics - Summer 19): Introduction to Programming for Data Science

Python at Industry

Google



YouTube

Team

Ahmet Uysal
auysal16@ku.edu.tr

İpek Köprülülü
ikoprululu16@ku.edu.tr

Weekly Schedule

Monday 17:30–18:45 **Lecture**

Wednesday 17:30–18:45 **Contest/Review**

Every Week **HackerRank Contest**

We will use HackerRank a lot this semester, create your account if you have not already!

Programming Assignments

- 4-6 Programming Assignments
- Review sessions will be conducted to **help you**
- Some assignments will have **autograders** to help you find your mistakes and test your code.
- Later assignments will be based on **your interests!**
- We can also organize hackathons if requested :)

Programming Contests

- Weekly Online Contests
  - 5-10 Programming questions related to topic we have seen
  - Duration: 1 week (Starts after the lecture on Monday, ends before next lecture)
- Biweekly Onsite Contests
  - Wednesdays, on weeks which you don't have an assignment
  - 2-3 Programming questions related to Monday's lecture
  - Duration: 50 minutes
  - Questions will be solved in remaining 25 minutes
  - Surprize gifts to first three places and problem solvers!

Certificate Requirements

- At most **3 unexcused absences**, including onsite contests and review sessions.
- Working on and submitting all homework assignments. Submissions that do not pass the autograders will be examined by us.
- We do not expect that you ace all programming assignments. But, we expect that you **spend time** on it!
- Complying to *Koç University Code of Conduct*.

Installing Python

- Go to *python.org/downloads*
- Install the Python 3.7.2 for your operating system
- (Windows only) Make sure to add python to the `environment variables` by checking the corresponding permission on the installation or by hand
- Check the installation by running **`python`**(Windows)/**`python3`**(macOS/Linux) in terminal.

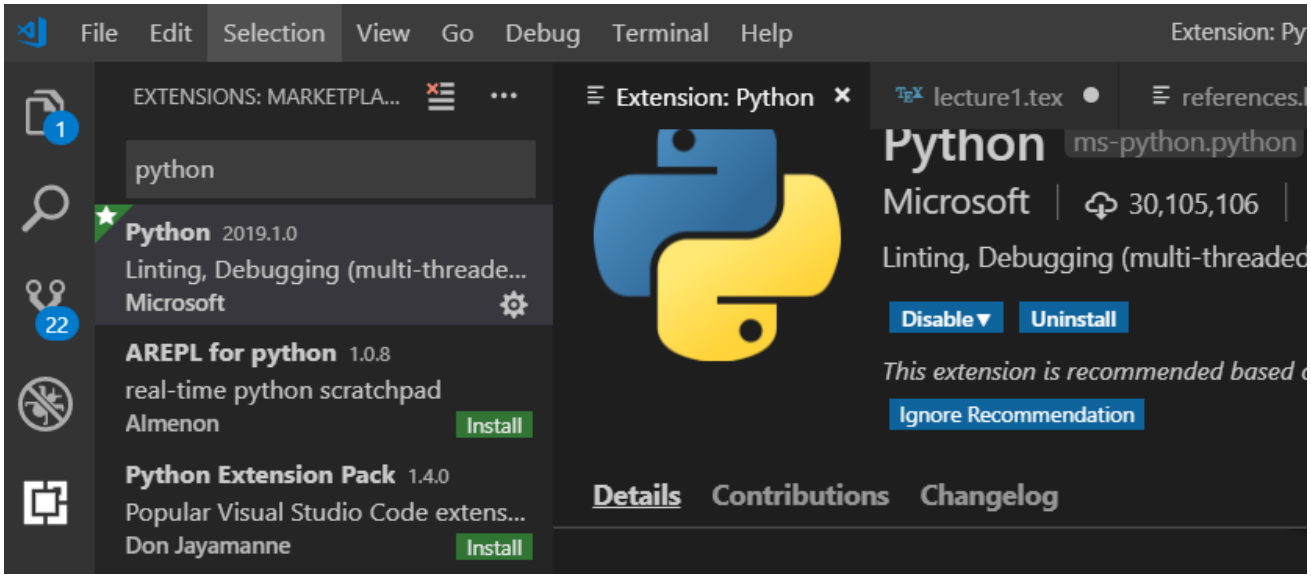
```
C:\Users\AUYSAL16>python
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 23:09:28) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print('hello, world!')
hello, world!
```

Installing an Editor/IDE(Integrated Development Environment)

- Although you can edit Python(.py) files with any text editor and run them directly through terminal, having a specialized editor/IDE can help a lot.
- We will use Visual Studio Code in lectures but you are free to use any editor/IDE of your choice.
- Get Visual Studio Code from *code.visualstudio.com/Download*

Configuring Visual Studio Code for Python

- Install Python extension for VS Code.
- Select the Python(3.7.2) Interpreter in VS Code.
- For more information, visit *VS Code Python Tutorial*.



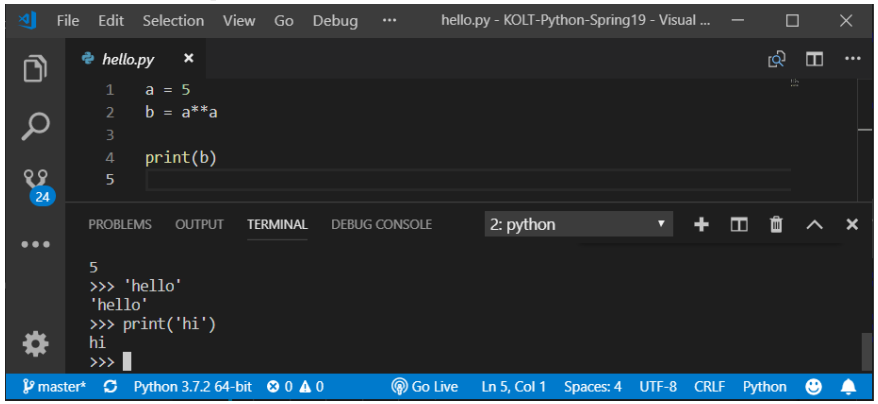
Interactive Interpreter

You can instantly run code on terminal!

Command Prompt - python

```
C:\Users\AUYSAL16>python
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 23:09:28) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print('You can write Python code here!')
You can write Python code here!
>>>
```

You can also open a terminal inside VS Code



Why It Matters?

- Immediate gratification :)
- Provides a sandboxed environment to experiment
- You are not sure what something does, **try it!**
- Shortens code-test-debug cycle and speeds up learning

Comments

```
# Single line comments start with a '#'

"""
Multiline comments can be written between
three "s and are often used as function
and module comments.
"""
print('Hello, stranger!')
```

Python will basically ignore comments, they are purely written **for humans**!

Variables

- How to represent/store values in Python?
- Which kind of values we need to represent?
  - Numbers?
  - Texts?
  - Individual Characters?
  - Starting time of the class?
  - Colors?
  - Truth Values?
  - People?

Variables

Type	Explanation	Examples
`int`	represent **integers**	3, 4, 17, -10
`float`	represent **real numbers**	3.0, 1.11, -109.123123
`bool`	represent **boolean** truth values	`True`, `False`
`str`	A sequence of characters.	'Hello', '', '3'
`NoneType`	special and has one value, None	`None`

OK, but how do we create one?

Variables

```
x = 2
x * 7
# => 12
x
# => 2
x = x * 7

y = 'Hello'
y + ' World!'
# => 'Hello World!'
```

How about type of variables?

Special method called **`type()`**

```
type(1) # => <class 'int'>
type('Hello') # => <class 'str'>
type(None) # => <class 'NoneType'>
type('') # => <class 'str'>

type(int) # => <class 'type'>
type(type(int))# => <class 'type'>
```

Python knows variables' type even if you don't know it!

Console I/O(Input/Output)

References

[1] P. Guo, “Python is now the most popular introductory teaching language at top u.s. universities.” [Online]. Available: https://cacm.acm.org/blogs/blog-cacm/176450-python-is-now-the-most-popular-introductory-teaching-language-at-top-u-s-unive fulltext

[2] JetBrains, “Python developers survey 2018.” [Online]. Available: https://www.jetbrains.com/research/python-developers-survey-2018/