

KOLT Python

Introduction

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Monday 18th February, 2019

KOLT

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?

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

```
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

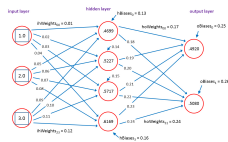
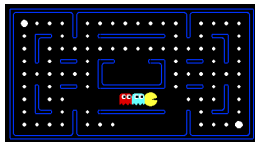
Some of the Usage Areas[2]

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

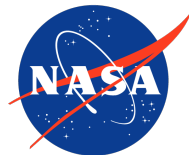


Python at Koç University

- COMP341: Introduction to Artificial Intelligence
- COMP421/521: Introduction to Machine Learning
- ENGR350(Selected Topics - Summer18/Spring19): Introduction to Programming for Data Science
- INTL450(Selected Topics - Spring19): Advanced Data Analysis in Python



Python at Industry



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



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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
 - Surprise 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!
```

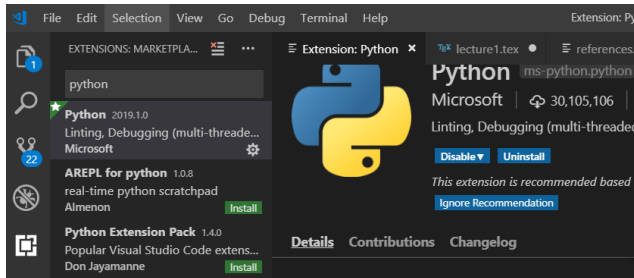
Installing an Editor/IDE(Integrated Development Environment)

- 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](#).



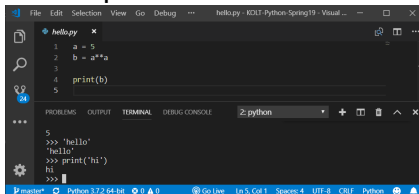
Interactive Interpreter

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
# => 14

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)

Now we can store the data we know,
how about interacting with user?

```
print(), input()
```

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

Console I/O(Input/Output)

print(*args, sep=' ', end='\n')

- Can take arbitrary number of arguments
- Separates elements with space by default
- Adds newline character '\n' to end by default

input([prompt])

- Prints the prompt to Console
- Waits for user input
- Program is paused until user enters something
- **returns an str object!**

Example Program

```
number = input('Please enter a number:')  
# Assume user entered 34  
result = number * 2  
# What will we see in console?  
print(result)
```

LET'S TRY!!!

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