



Lab-Report

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Report Name: Introduction to Python

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Experiment No: 01

Experiment Name: Introduction to Python

Theory:

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms.

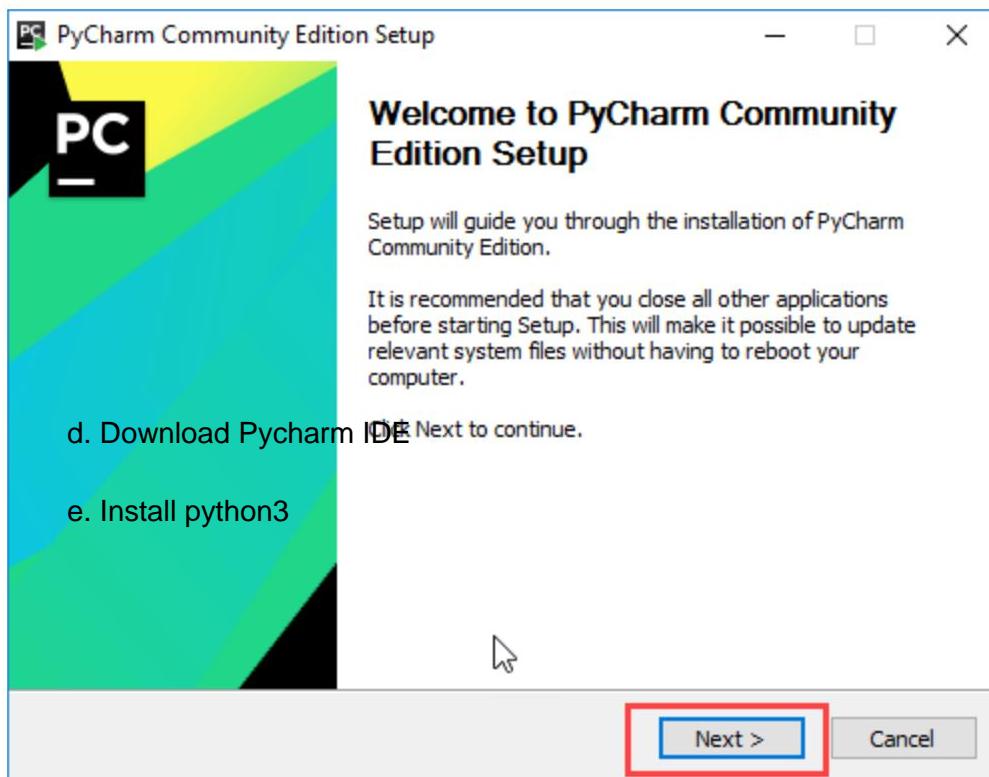
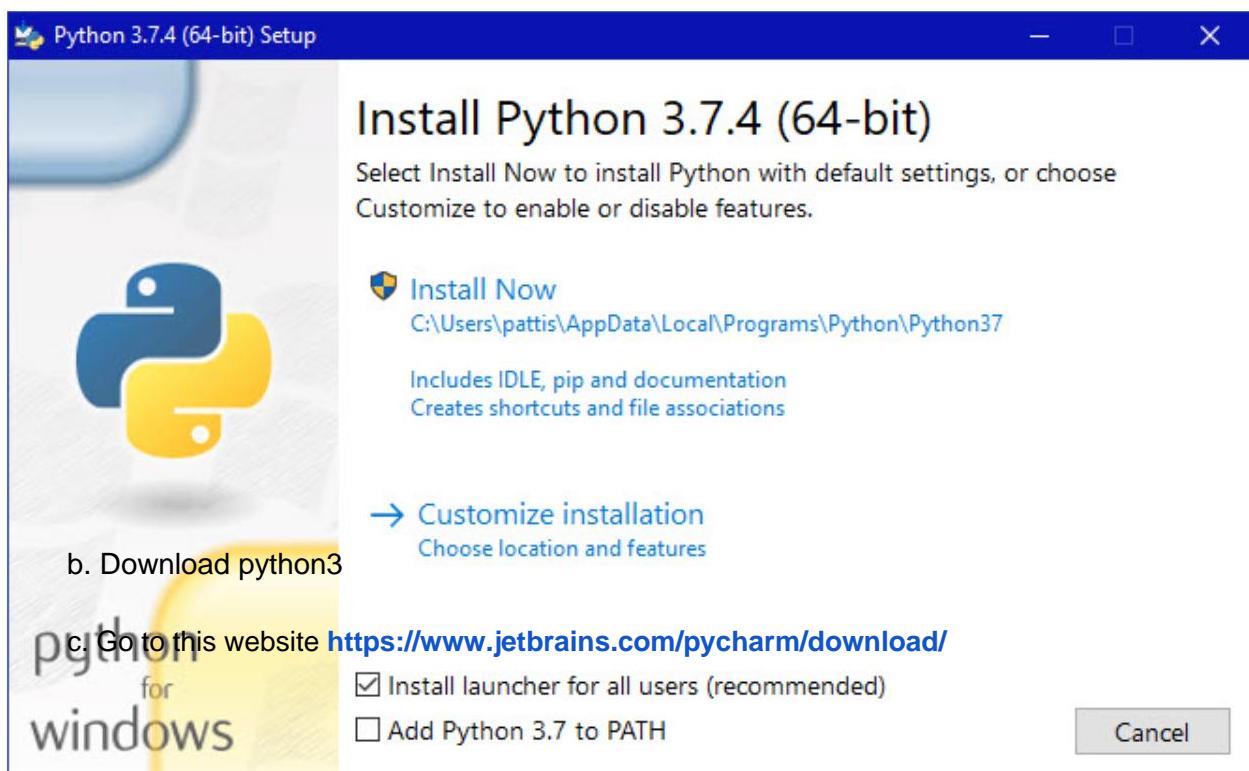
Methodology:

Setup of Python Environment:

Section 3.1: Download python3 and Pycharm IDE and install them.

STEP 1: In order to set up follow the instructions :

- a. Go to this website <https://www.python.org/downloads/>

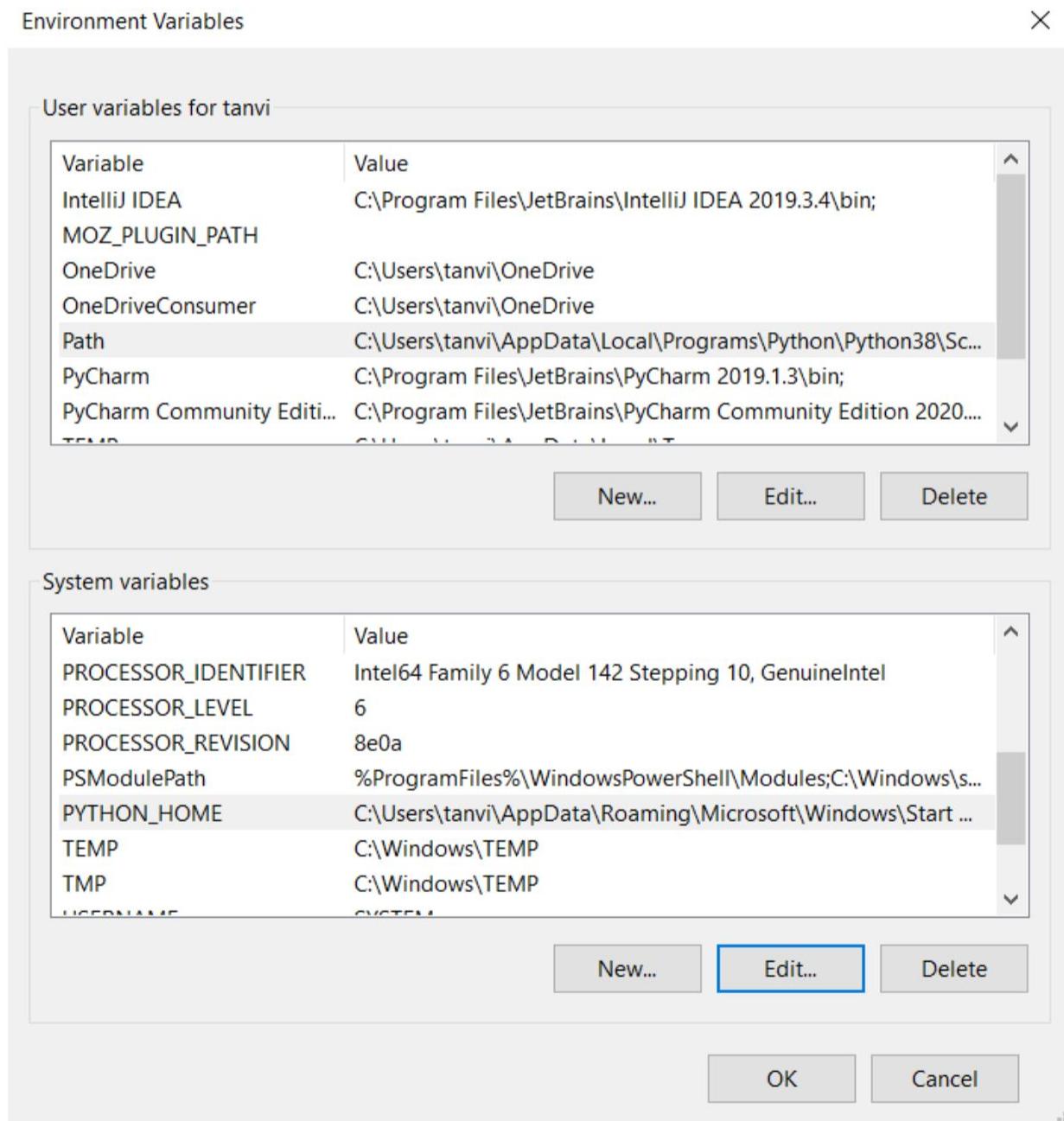


Section 3.2: Setup of Python Environment

STEP 1: Open windows environment variables settings and set the path variable of python3.

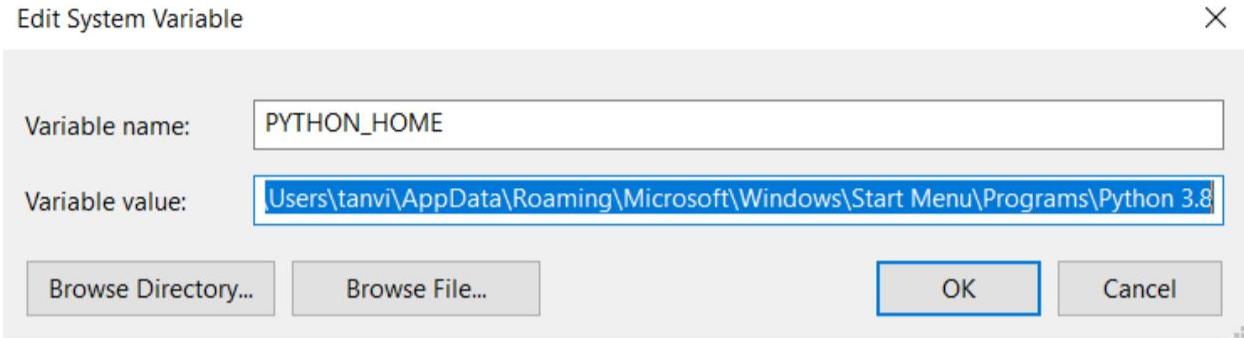
In order to set up follow the instructions :

- a. Go to **Control Panel >System and Security >System >Advanced System Settings**
- b. Open **Environment variables settings**



c. In the System Variables Section create a new variable named

PYTHON_HOME d. Set the path for PYTHON_HOME



e. Save that path.

Section 3.3: Start pycharm IDE.

In order to start pycharm IDE follow these instructions :

a. Go to **Start**



The screenshot shows the PyCharm IDE interface. The project navigation bar at the top indicates the path: Python > Example > Test.py. The left sidebar displays the project structure under the Python directory, including a .idea folder, an Exercise 4.1.2: Write a Hello World Example folder containing __init__.py and Test.py, and an External Libraries section. The main code editor window shows the file Test.py with the single line of code: `print("hellow world")`. Below the editor, the run tool window shows the command: `C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py`, followed by the output: `hellow world` and `Process finished with exit code 0`.

Exercise 4.1.3: Compute 1+1

The screenshot shows the PyCharm IDE interface. The project navigation bar at the top indicates the path: Python > Example > Test.py. The left sidebar displays the project structure under the Python directory, including a .idea folder, an Example folder containing __init__.py and Test.py, and an External Libraries section. The main code editor window shows the file Test.py with the single line of code: `print(1+1)`. Below the editor, the run tool window shows the command: `C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py`, followed by the output: `2` and `Process finished with exit code 0`.

The screenshot shows the PyCharm IDE interface with the following details:

- Title Bar:** Python > Example > Test.py
- Toolbars:** Standard toolbar with icons for file operations.
- Project Structure:** Shows a Python project structure with a .idea folder, Example directory containing __init__.py and Test.py, and External Libraries.
- Code Editor:** Displays the contents of Test.py:

```
1 he = 5.0
2 ra = 1.5
3 pi = 3.1416
4
5 area = he*ra
6 print('the area of paralleogram is %.3f' % area)
7
8 area_square = he**2
9 print('the area of square is %.3f' % area_square)
10
11 area_circle = pi*ra**2
12 print('the area of circle is %.3f' % area_circle)
13
14 volume_cone = 1.0/3*pi*ra**2*he
15 print('the volume of the cone is %.3f' % volume_cone)
16
17
18
19
```
- Run Tab:** Shows the run configuration: Run: Unnamed | Test. It lists the command: C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py and the output:

```
the area of paralleogram is 7.500
the area of square is 25.000
the area of circle is 7.069
the volume of the cone is 11.781
```
- Bottom Status Bar:** Process finished with exit code 0

Section 4.2.1: Create and run basic example.

The screenshot shows the PyCharm IDE interface with a Python project structure on the left and a code editor on the right. The code editor displays a Python script named `Test.py` containing the following code:

```
x = int(input("Enter first number : "))
y = int(input("Enter second number : "))
plus = x + y
print('Sum of {0} & {1} = {2}'.format(x,y,plus))

minus = x - y
print('MINus of {0} & {1} = {2}'.format(x,y,minus))

multiply = x*y
print('Multiply of {0} & {1} = {2}'.format(x,y,multiply))

power = x**y
print('Power of {0} & {1} = {2}'.format(x,y,power))

Divide = x/y
print('Divide of {0} & {1} = {2}'.format(x,y,Divide))

floor = x//y
print('FLoor of {0} & {1} = {2}'.format(x,y,floor))

modulo = x%y
print('Modulo of {0} & {1} = {2}'.format(x,y,modulo))
```

The Run tab at the bottom shows the output of the script when run with inputs 20 and 10:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py
Enter first number : 20
Enter second number : 10
Sum of 20 & 10 = 30
MINus of 20 & 10 = 10
Multiply of 20 & 10 = 200
Power of 20 & 10 = 1024000000000000
Divide of 20 & 10 = 2.0
FLoor of 20 & 10 = 2
Modulo of 20 & 10 = 0
```

Exercise 4.2.2: The if statement:

The screenshot shows the PyCharm IDE interface. The left sidebar displays a project structure with a Python directory containing .idea, Example, __init__.py, and Test.py. The main editor window shows the following Python code:

```
else:  
    number = 10  
    number2 = int(input("Enter any Number : "))  
    if(number==number2):  
        print('equal')  
    else:  
        print('Not equal')
```

The code compares a fixed value of 10 with user input. If they are equal, it prints 'equal'; otherwise, it prints 'Not equal'. The run tab at the bottom shows the terminal output:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py  
Enter any Number : 20  
Not equal  
Process finished with exit code 0
```

Exercise 4.2.3: The while Statement

The screenshot shows the PyCharm IDE interface. On the left, the Project tool window displays a Python project structure with a file named `Test.py`. The code in `Test.py` is as follows:

```
number = 10
number2 = int(input("Enter any number :"))

while(number <= number2):
    print(number)
    number = number +1
```

In the bottom right pane, the Run tool window shows the execution results of the script. The command run was `C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test`. The output is:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test
Enter any number :15
10
11
12
13
14
15

Process finished with exit code 0
```

Exercise 4.2.4: The for Statement

The screenshot shows the PyCharm IDE interface. The top bar displays the project name "Python" and the file "Test.py". The left sidebar shows the project structure with a "Python" folder containing ".idea", "Example", "__init__.py", and "Test.py", along with "Python.iml" and "External Libraries". The main editor window contains the following Python code:

```
for i in range(5):
    print(i)
```

The output window at the bottom shows the execution results:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\p
0
1
2
3
4
```

Question 5.1: Explain what is eclipse? And why we use it for programming on python?

Answer:

Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. ... It was one of the first IDEs to run under GNU Classpath and it runs without problems under IcedTea.

For python development under Eclipse you can use the PuDev Plugin which is an open source project. So, we use it for programming on python.

Question 5.2: Explain three main characteristics of python that you test in the lab?

Answer:

Features in Python

There are many features in Python, some of which are discussed below –

1. Easy to code:

Python is a very developer-friendly language which means that anyone and everyone can learn to code it in a couple of hours or days. As compared to other object-oriented programming languages like Java, C, C++, and C#, Python is one of the easiest to learn.

2. Open and Free Source:

Python is an open-source programming language which means that anyone can create and contribute to its development. Python has an online forum where thousands of coders gather daily to improve this language further. Along with this python is free to download and use in any operating system, be it Windows, Mac or Linux.

Question 5.3: Which is the difference between empty module and main module when creating a python script?

Answer:

A module is a file containing Python code. Python modules can be managed using functions, classes etc.

A module name is the file name with the .py extension. When we have a file called empty.py empty is the module name. The `__name__` is a variable that holds the name of the modules being executed called also the main module, has a special name: '`__main__`'. With this name it can be referenced from the Python code.

Question 5.5: Create a python program that combines at least 4 operators and one statement (if, while or for)

Answer:

The screenshot shows the Eclipse IDE interface with a Python project named 'Example'. The 'Test.py' file is open in the editor, displaying the following code:

```
for i in range(...): for j in b else:
    a = int(input('Enter the elements : '))
    b.append(a)
    sum = 0
    sum1 = 0
    sum2 = 0
    for j in b:
        if(j>0):
            if(j%2==0):
                sum= sum + j
            else:
                sum1 = sum + j
        else:
            sum2 = (sum2+j) * (-1)
    print('Sum of all positive even : ', sum)
    print('Sum of all positive odd : ', sum1)
    print('Sum of all number : ', sum2)
```

The code calculates the sum of positive even, odd, and total numbers entered by the user. The terminal window below shows the execution of the script and its output for two test cases.

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py
Enter number of element : 3
Enter the elements : 10
Sum of all positive even : 10
Sum of all positive odd : 0
Sum of all number : 0
Enter the elements : 20
Sum of all positive even : 30
```

Discussion:

In this lab, we can learn setup the python in eclipse, and can execute a python code successfully. Python is a language that is remarkably easy to learn, and it can be used as a stepping stone into other programming languages and frameworks. If you're an absolute beginner and this is your first time working with any type of coding language.