Practical No. 1

Aim:

Write a program which demonstrates the following:
1. Addition of two complex numbers.
2. Displaying the conjugate of a complex number.
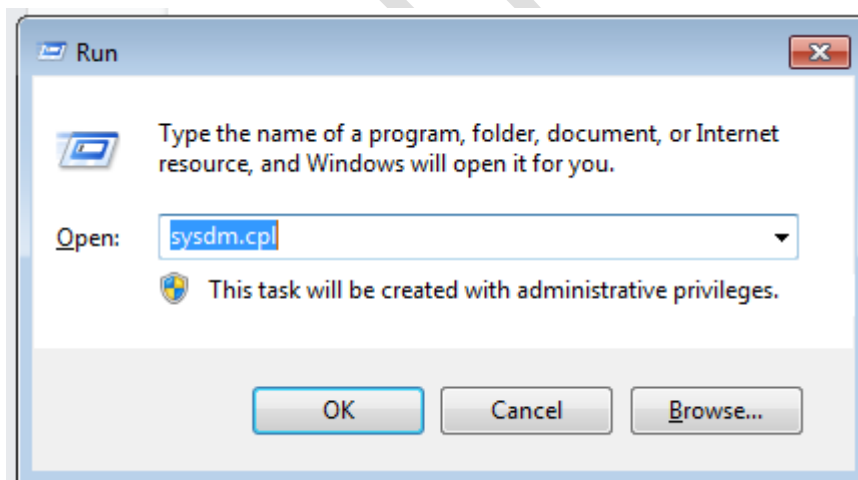3. Plotting a set of complex numbers.

Description:

1. Define complex number.
2. Explain the following packages:
   i. numpy
   ii. matplotlib
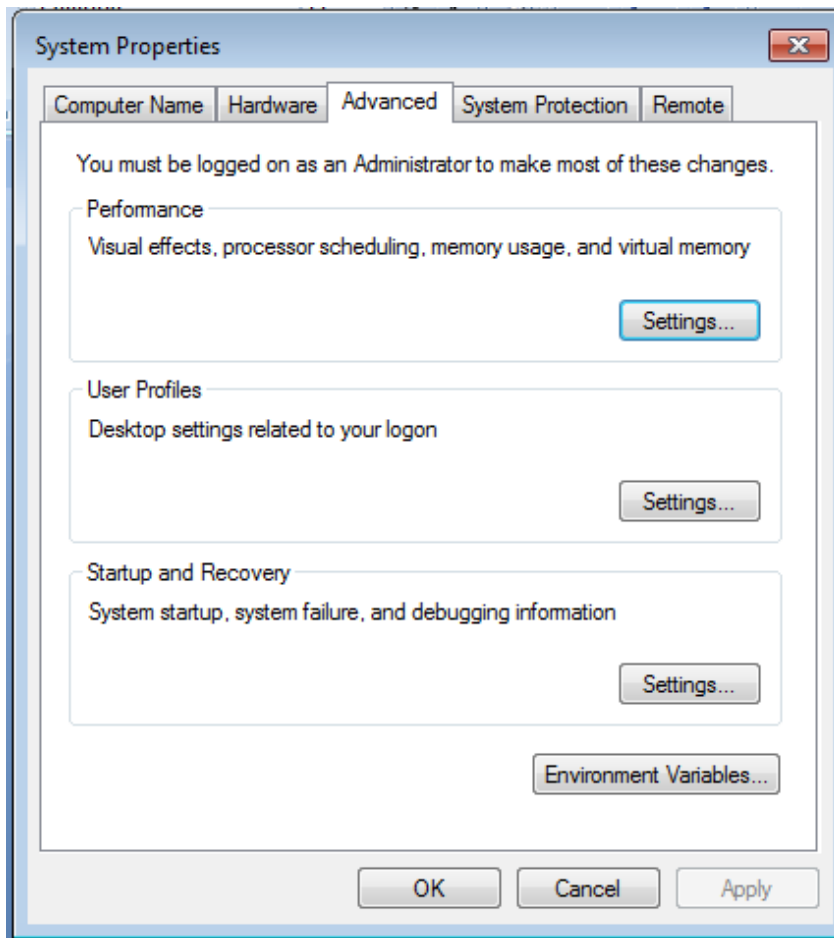3. Define conjugate of complex number.
4. Find the conjugate of z=3+2i.

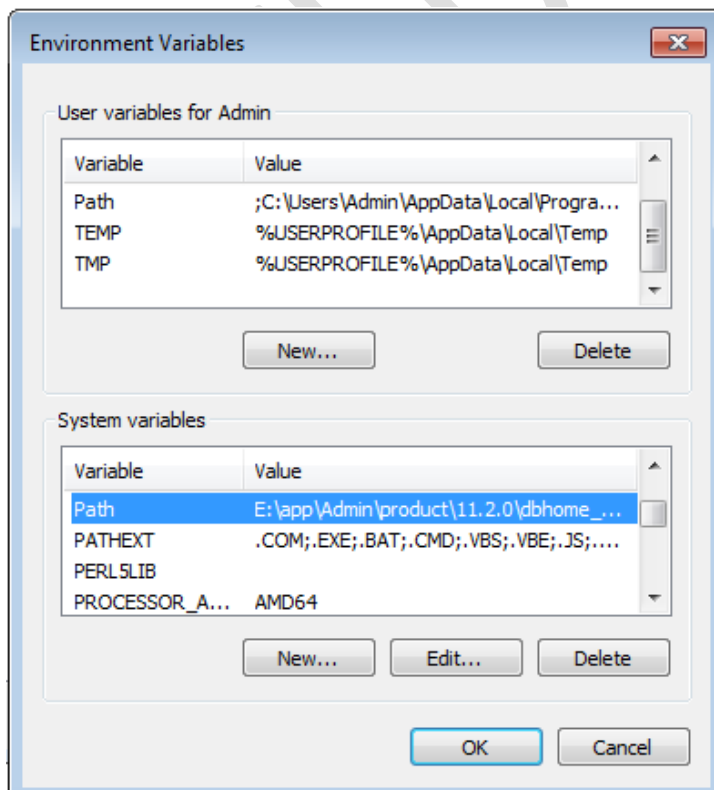**Code & Output:**

Steps: Change the environmental variables
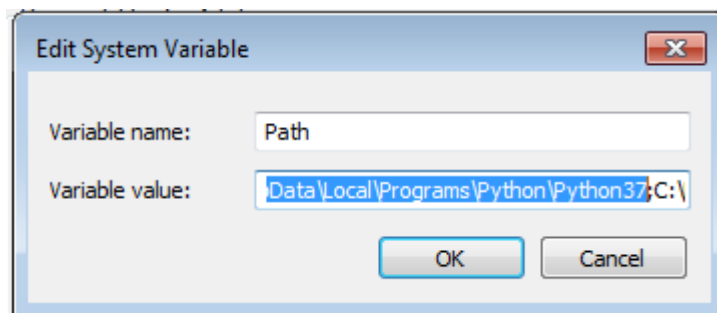
a. Start the **Run** box and enter **sysdm.cpl**

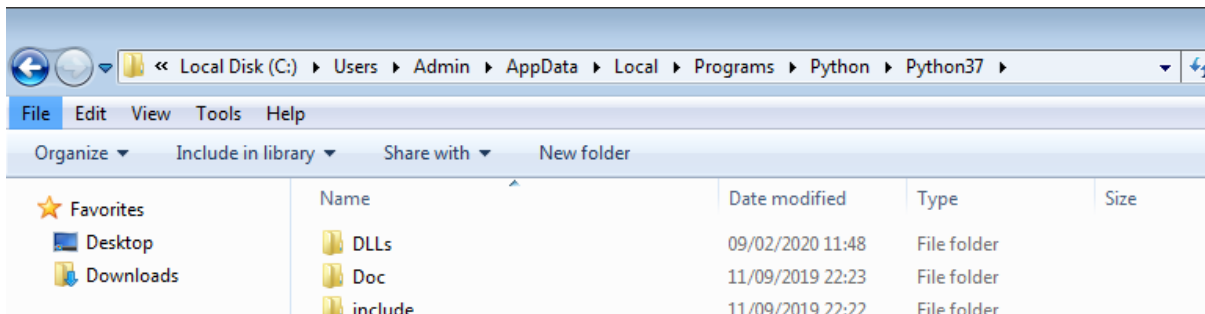b. Go to the **Advanced** tab and click the **Environment Variables** button

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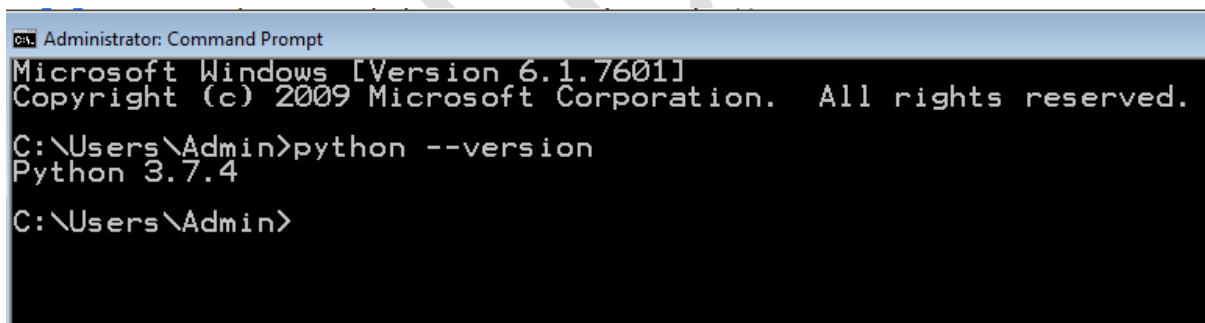MVLU College

c. In the **System variable** window, find the **Path** variable and click **Edit**
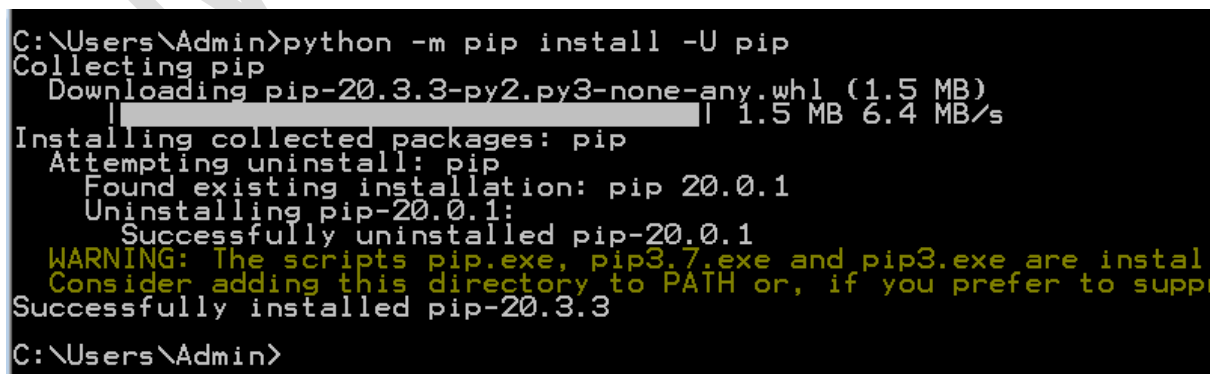

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d. Copy the path of Python

e. To check -> python --version

f. Run the following commands on command prompt:

```
C:\Users\Admin>python -m pip install -U matplotlib
Requirement already satisfied: matplotlib in c:\users\admin\appdata\loca
Collecting matplotlib
  Downloading matplotlib-3.3.3-cp37-cp37m-win_amd64.whl (8.5 MB)
      |████████████████████████████████| 8.5 MB 3.3 MB/s
Requirement already satisfied: numpy>=1.15 in c:\users\admin\appdata\loc
Requirement already satisfied: cycler>=0.10 in c:\users\admin\appdata\lo
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\admin\appda
Requirement already satisfied: python-dateutil>=2.1 in c:\users\admin\ap
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3
tlib) (2.4.2)
Requirement already satisfied: six in c:\users\admin\appdata\local\progr
Requirement already satisfied: setuptools in c:\users\admin\appdata\loca
.0)
Collecting pillow>=6.2.0
  Downloading Pillow-8.1.0-cp37-cp37m-win_amd64.whl (2.2 MB)
      |████████████████████████████████| 2.2 MB 6.4 MB/s
Installing collected packages: pillow, matplotlib
  Attempting uninstall: matplotlib
    Found existing installation: matplotlib 3.1.2
    Uninstalling matplotlib-3.1.2:
      Successfully uninstalled matplotlib-3.1.2
Successfully installed matplotlib-3.3.3 pillow-8.1.0

C:\Users\Admin>
```

```
C:\Users\Admin>python -m pip install numpy
Requirement already satisfied: numpy in c:\users\admin\appdata
```

1. Addition of two complex numbers

```
>>> x=1+3j
>>> y=10+3j
>>> print("Addition of two complex numbers : ",x+y)
Addition of two complex numbers :  (11+6j)
```

2. Displaying the conjugate of a complex number

```
>>> a=4+2j
>>> print("Conjugate of a given complex number : ",a.conjugate())
Conjugate of a given complex number :  (4-2j)
```
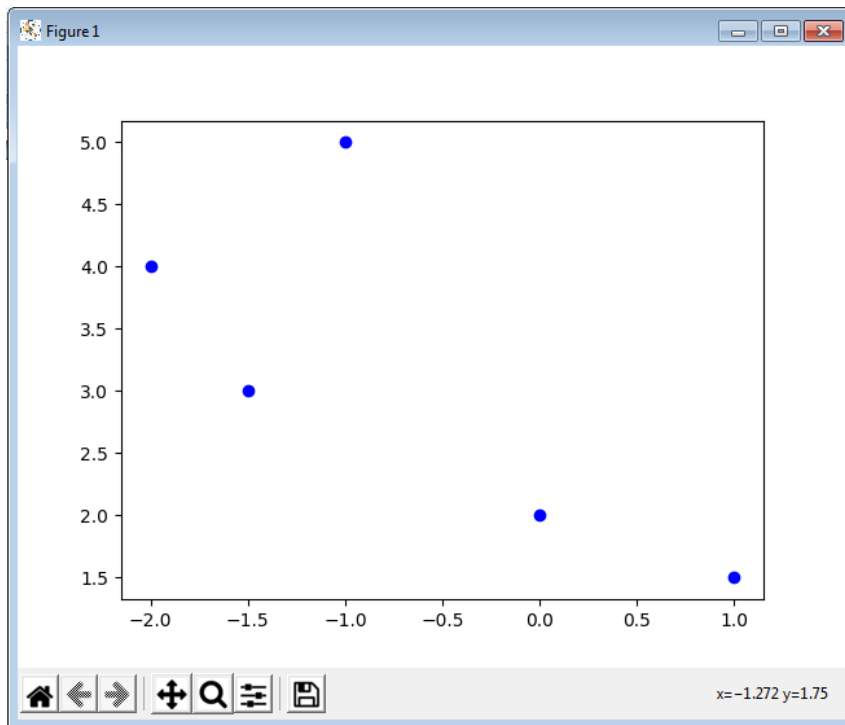
3. Plotting a set of complex numbers

```
prac1.py - C:/Users/Admin/AppData/Local/Programs
File  Edit  Format  Run  Options  Window  Help

import matplotlib.pyplot as plt
x=2+2j
a=[-2+4j,-1.5+3j,-1+5j,0+2j,1+1.5j]
X=[x.real for x in a]
Y=[x.imag for x in a]
plt.scatter(X,Y,color='blue')
plt.show()
```

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Extra Activities

1. (1+3j) + (10+20j)
2. If x=1+3j then find (x-1)**2
3. 1+2j*3
4. 4*3j**2
5. If x=1+3j the find x.real & x.imag
6. If x=1+3j the find x.conjugate
7. Plot S = {3+3i, 4+3i, 2+i, 2.5+i, 3+i, 3.25+i}