

Python Practical

(Classes and Object-Oriented Programming)

- 1) Write a Python program to create a class that perform basic Calculator operation.
- 2) Write a Python Class to find 5 Elements who sum is zero from set of n real numbers.
- 3) Write a program that accepts a sentence and calculate the number of letters and digits.

Suppose the following input is supplied to the program:

hello world! 123

Then, the output should be:

LETTERS 10

DIGITS 3

4)

You are given four points A, B, C and D in a 3-dimensional Cartesian coordinate system. You are required to print the angle between the plane made by the points A, B, C and B, C, D in degrees(**not radians**). Let the angle be ϕ .

$$\cos(\phi) = (X \cdot Y) / (|X| |Y|) \text{ where } X = AB \times BC \text{ and } Y = BC \times CD.$$

Here, $X \cdot Y$ means the dot product of X and Y , and $AB \times BC$ means the cross product of vectors AB and BC . Also, $AB = B - A$.

Input Format

One line of input containing the space separated floating number values of the X, Y and Z coordinates of a point.

Output Format

Output the angle correct up to two decimal places.

Sample Input

```
0 4 5
1 7 6
0 5 9
1 7 2
```

Sample Output

```
8.19
```

- 5) you are given two complex numbers, and you have to print the result of their addition, subtraction, multiplication, division and modulus operations.

The real and imaginary precision part should be correct up to two decimal places.