

IDC101 (Introduction to Computation) :

Lab session 2

Exercise 1 :

Write a python program which will accept the radius of a circle from the user as input and compute the area of a circle. Here is a sample program.

You can copy this program to a file and then save the file. Execute the program. If there is any error in the program, fix the error yourself. Format the output properly.

Exercise 2 :

Write a program which accepts the user's first and last name and print them in reverse order with a space between them. Output should be formatted. Use `format` to control the amount of space between last and first name. For example, try giving 3, 5 and 10 empty spaces between the names.

Exercise 3 :

Write a program which will take the value of x and y as input from the user and compute the value of u given by the following equation.

$$u = \frac{(\sqrt{x} + \sqrt{y})^2}{(x + y)^{1/4}}$$

The output should mention the value x and y and the computed value u . The output should be properly formatted. The value of u should be formatted to show only 6 decimal places in the output. Test your program to see if it works with different input values.

Exercise 4 :

The program you write should take a real (float) number as input. Then, it should output the same number showing 8 decimal places accuracy.

Exercise 5 :

If $\sin x \approx x - x^3/6$, then compute the percentage error in the computed value of sine function for $x = \pi/2$. Show a formatted output. Use `format` to control how many digits are displayed in your answer. Display 2, 4, 8, 12 digits of your answer. What is the maximum number of digits you can display this way ?

Exercise 6 :

Consider this word INDEPENDANCE. Write a program to read this word as user given input. Write the output using format command such that 40 spaces are reserved to show the output. Write formatted output such that (i) the word occupies the centre of 40 spaces, (ii) occupies the left extreme position and (iii) occupies the right extreme position.

Exercise 7 :

Given the volume of a sphere V , find the radius of the sphere. Your program should take V as input and output of the program should look like the following :

The volume of given sphere : V
This corresponds to radius : r

Both V and r should display number up to 6 decimal places.

Exercise 8 :

Write a program to compute the distance between two points (x_1, y_1) and (x_2, y_2) .

Exercise 9 :

Read two integers m and n as input. And print two lines as the answer. The first line should contain the remainder when m is divided by n . The second line should be the result of division m/n . Format the output of division in both decimal and scientific notation displaying 12 digits for each case.

Exercise 10 :

Write a program that takes x as input, and computes and writes the output of $\sin^2 x + \cos^2 x$ and $\sin^4 x + \cos^4 x$. Verify if your program is working correctly by giving inputs for which you know the answer, for example $x=0$. For this exercise you will have to use `import math` command to compute the value sine and cosine function. Find out for yourself how to do this.

Exercise 11 :

Take two real numbers x and y input. These numbers can be positive or negative. Find the square root of $x+y$. Does it work for all possible inputs ? Verify if it works for all possible inputs. And find out when it fails.