4CS001 –

Introductory Programming

&

Problem Solving

Workshop 2

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Week:2

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PART 1

1. What is the intuition behind assigning a value to a variable in python?

   Ans: The intuition behind assigning a value to a variable in python is to store values.

2. What are some common data types in Python, and when would you use each one?

   Ans: Some common data types in Python are:

   Numeric data types - numbers, integers, floating numbers

   String data types - for text

   Sequence type - for list, range

   Boolean type - true, false

3. Discuss the differences between mutable and immutable data types and give an example of each.

   Ans: The differences between mutable and immutable data types are:

S.N	Mutable data types	Immutable data types
1.	Fields can be modified after the object creation.	Fields cannot be modified after object creation.
2.	Has getter and setter methods.	Has only getter methods
3.	They are not final.	They are final.
4.	For example:user defined classes, lists, dicts, etc.	For example:int, float, string, unicode, etc.

4. Python is a dynamically typed language. What does this statement mean?

   Ans:Python is a dynamically typed language. This statement means that variables has the ability to assign values of different type at different times during execution.

PART 2

1. Evaluate the following Boolean expressions in **IDLE**:

Note down the response to each. Do they differ from what you would expect?

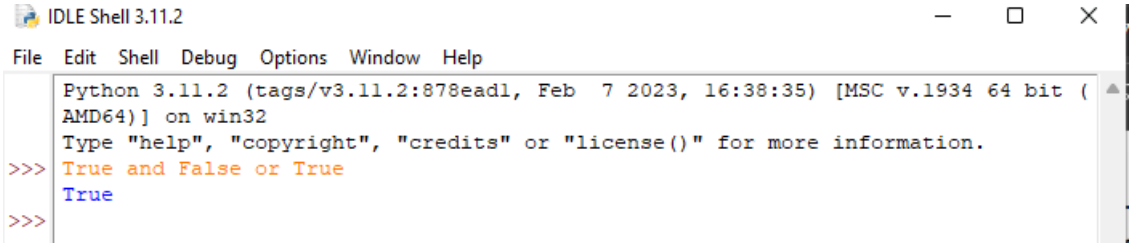
A. True and True

Source Code:

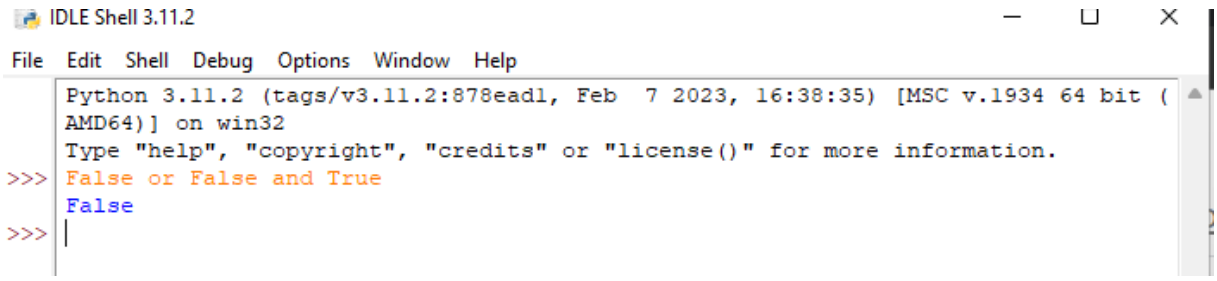
```
Python 3.7.5 (tags/v3.7.5:5c02a39a0b, Oct 15 20
(AMD64)] on win32
Type "help", "copyright", "credits" or "license
>>> true and true
Traceback (most recent call last):
  File "<pyshell#0>", line 1, in <module>
    true and true
NameError: name 'true' is not defined
>>> True and True
True
>>>
```

Output:

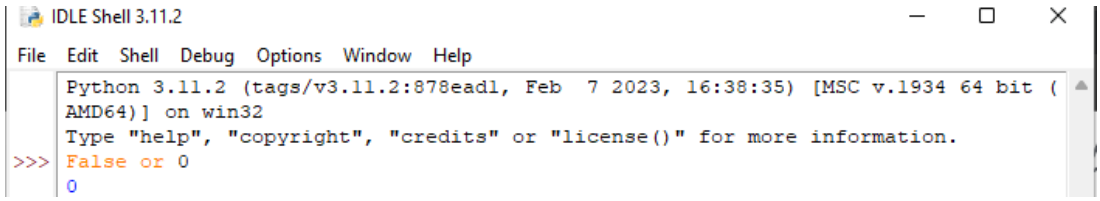
B. True and False or True



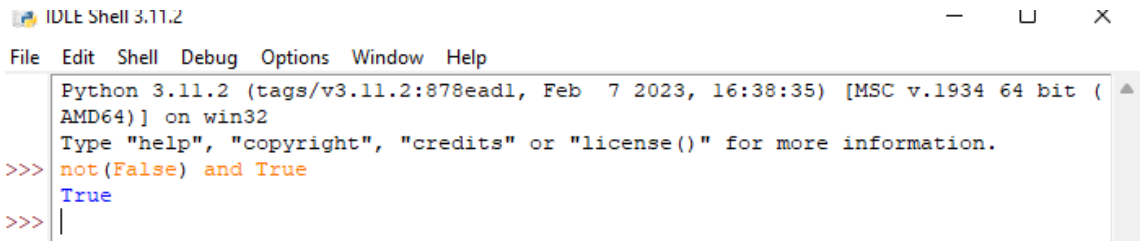
C. False or False and True



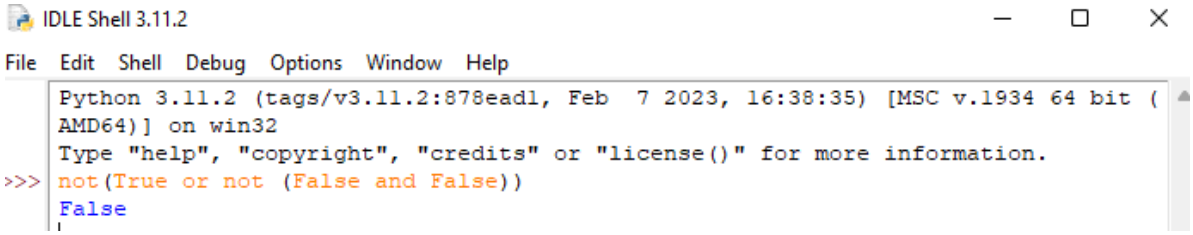
D. False or 0



E. not (False) and True

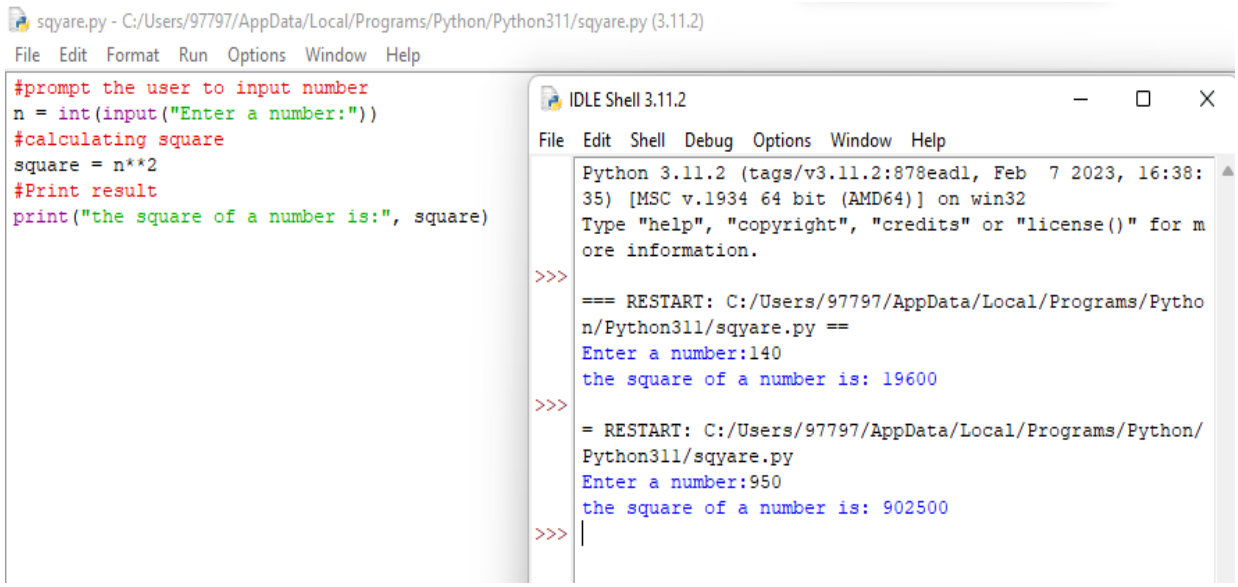


F. not (True or not (False and False))



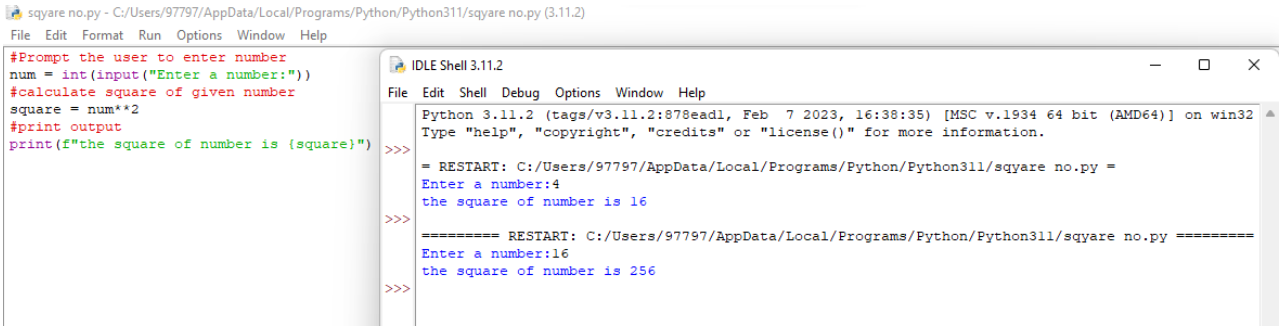
2. Write a python program to prompt the user for input number and print square of that integer.

Ans: Source code with output



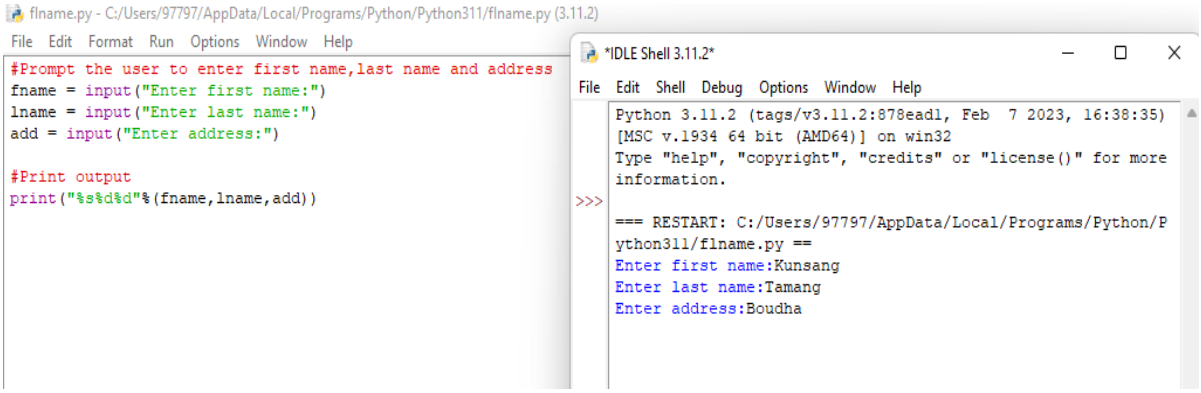
3. Write a python program to calculate a simple interest rate.

   Ans: Source code with output



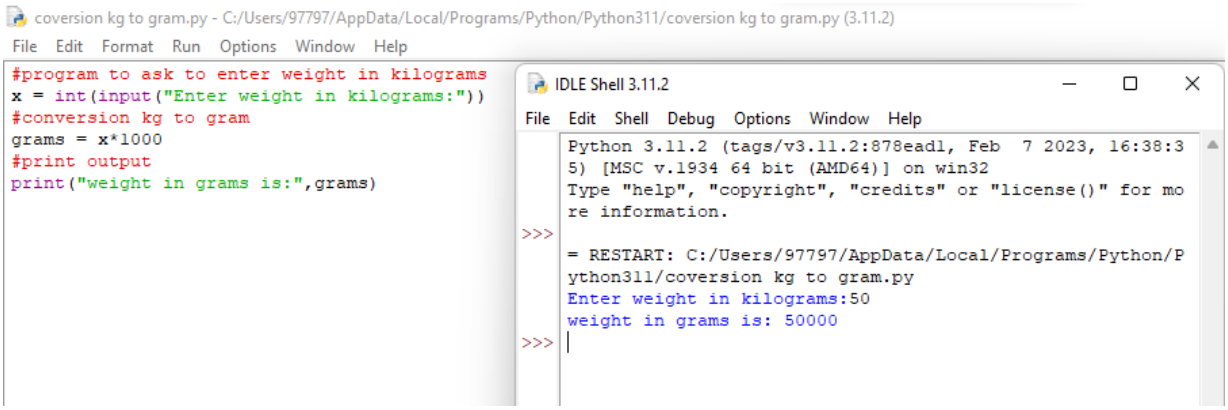
4. Write a python program to input first name, last name, and address. Print them.

   Ans: Source code with output



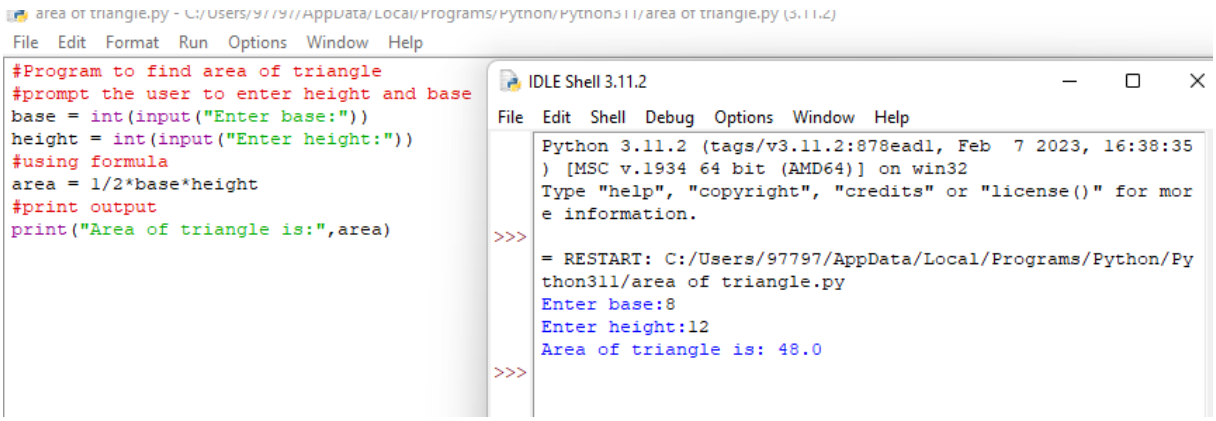
5. Write a python program to ask in kilograms and convert into grams

   Ans: Source code with output



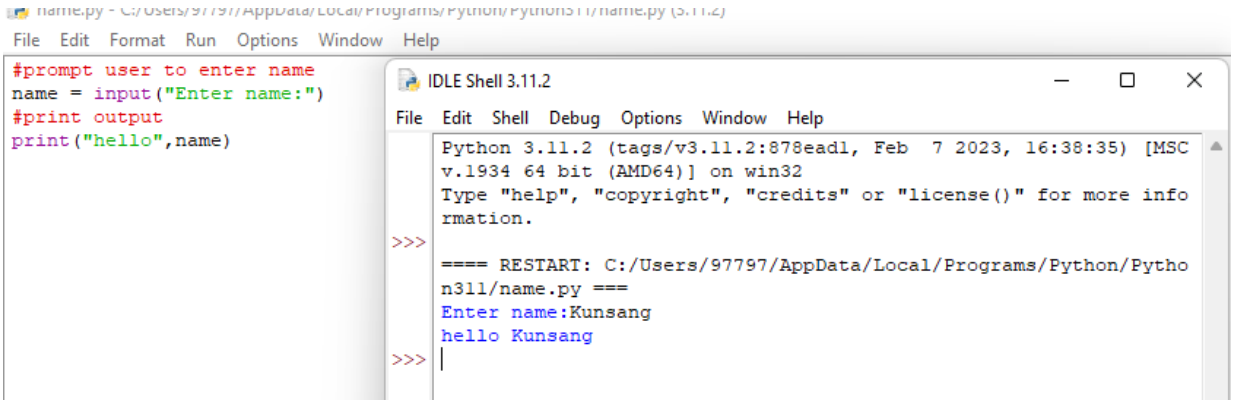
6. Write a python program to display the area of the triangle, (take user input).

   Ans: Source code with output



7. Write a python program to prompt user to input their name and print like

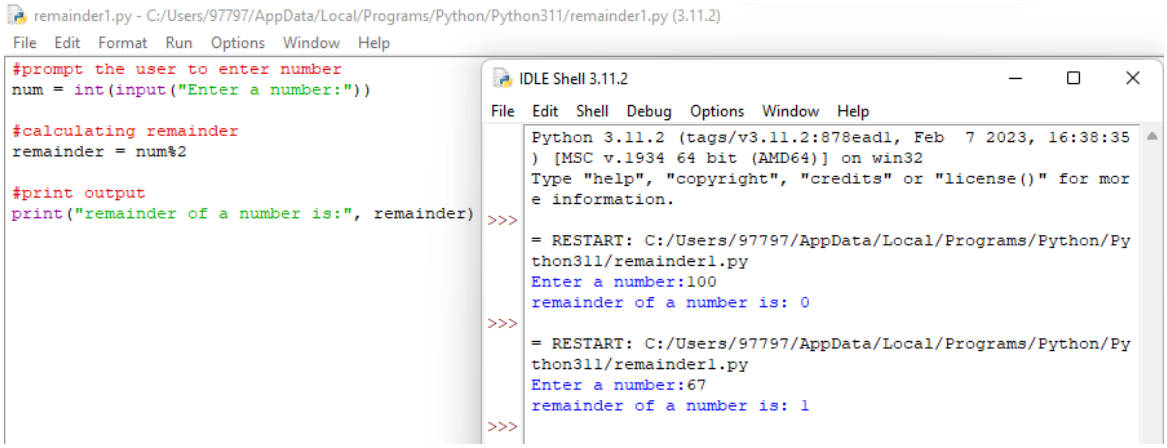
   Ans: Source code with output



PART 3

1. Write a python program to find the remainder of a given number if divisor is 2.

   Ans: Source code with output



2. Write a python program to calculate BMI of a person when all parameters are provided. ***BMI= weight(kg)/height(m^2)***

   Ans:

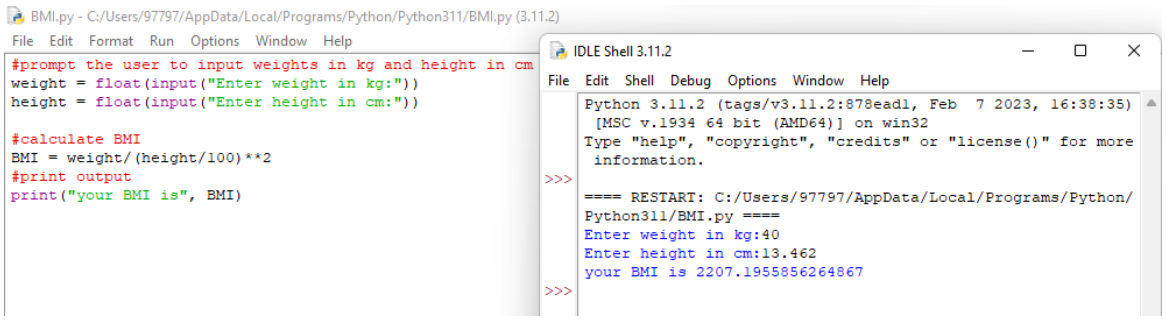
   Simple Logic

   - Asks to input the user's weight in kilograms.
   - Asks to input the user's height in centimeters.
   - Calculates the BMI (Body Mass Index).

[BMI=weight in kilograms / square of height in centimeters]

Prints the user's BMI.

Ans:

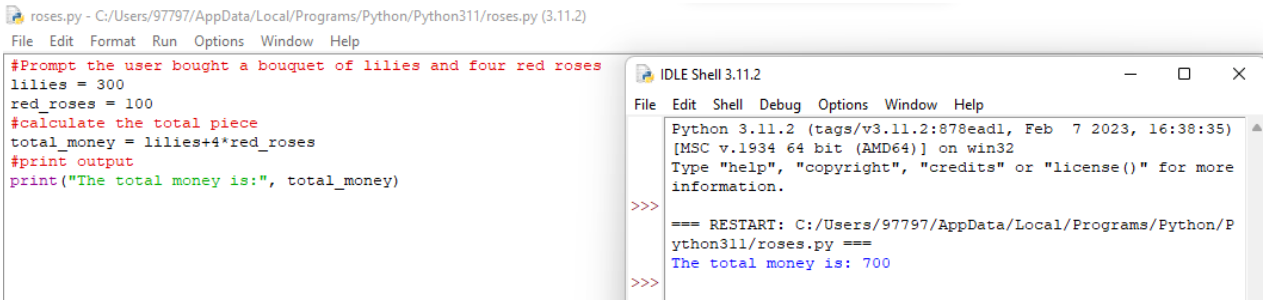


3. A costumer walks in a flower shop and finds the following menu:

Particulars	White Roses	Lilies	Poppies	Marigold	Red Roses
Per piece	50	50	40	20	100
Per bouquet	300	300	250	200	1000

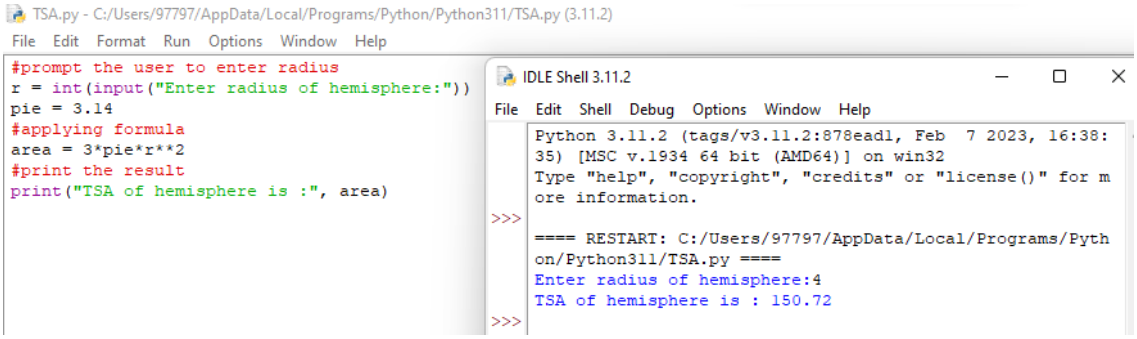
If the user bought a bouquet of lilies and four red roses, find the total money the user spent in the flower shop.

Ans: **Source code with output**



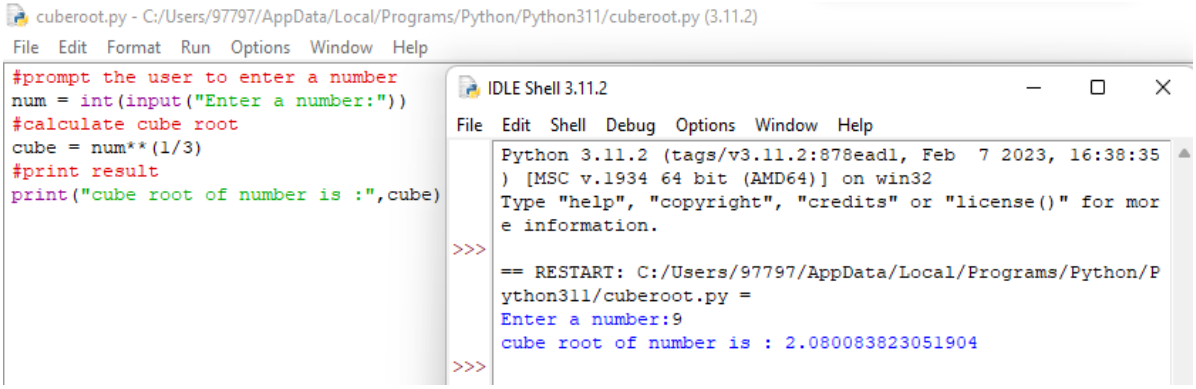
3. Write a python program to display the total surface area of the hemisphere.

Ans: Source code with output



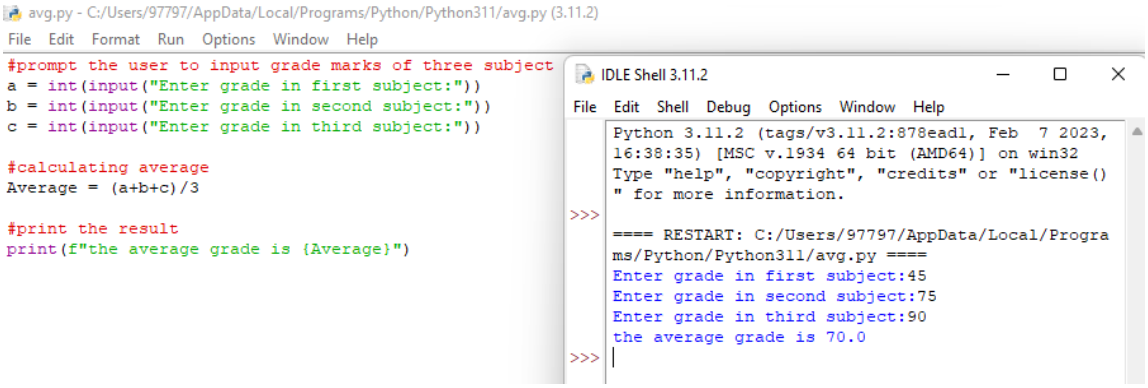
4. Write a program to find the cube root of a number. Prompt the user to input a number and print the cube root of the number.

Ans: Source code with output



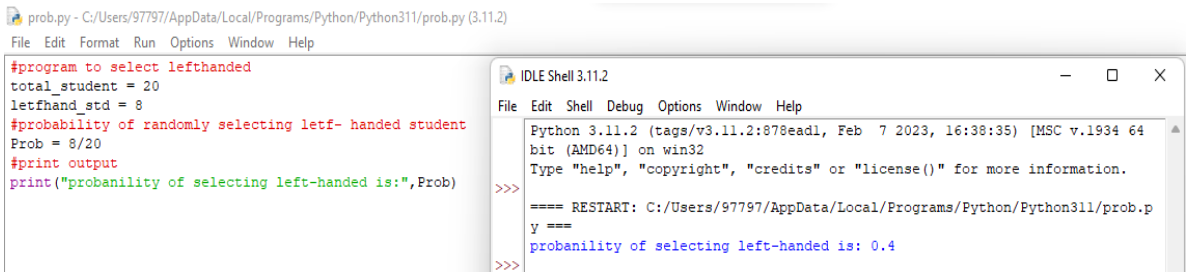
5. Suppose you are a teacher, and you want to create a program that takes in grades from three exams and calculates the average grade for a student. (Print out the average.)

Ans: Source code with output



6. Suppose there are 20 students in a class and 8 of them are left-handed. What is the probability of randomly selecting a left-handed student from the class?

Ans: Source code with output



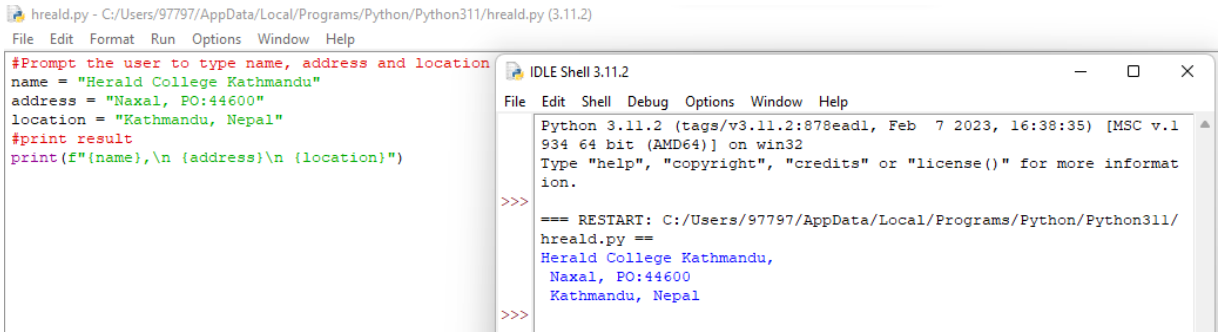
7. Write a python program to print this address as it is.

Herald College Kathmandu,

Naxal, PO:44600

Kathmandu, Nepal

Ans: Source code with output



PART 4 (Home Task – Case Study Based)

1. You're waiting at a station and the announcer has just broadcast that your train is going to be 13445 seconds late. You need to work out in understandable terms what that means. You assume this is going to be quite a long time so you whip out your laptop to write a program to convert the seconds into hours, minutes, and seconds, aiming to maximize readability by giving priority to the largest units, i.e. the resulting seconds and minutes values must not be greater than 60.

   You will need four variables to hold:

   - the total number of seconds.
   - the number of hours; the number of minutes.

- and the number of remaining seconds.

The example output should look something like this:

13442 Seconds is: 3 Hours, 44 Minutes, and 5 Seconds.

Ans: **Source code with output**