

Task 1: Running Python Script and various expressions in an interactive interpreter

Key Terms Covered: Introduction to python, commands, script. Tags – Easy, CO1, S3

1.1 Karan spent ₹150 on books, ₹220 on groceries, and ₹90 on transport. Help him calculate the total expenses.

Aim:

To write a Python program that calculates the total amount spent by Karan on books, groceries, and transport.

Algorithm:

1. Start the program.
 2. Accept the amount spent on books, groceries, and transport.
 3. Calculate the total expenses by summing all three amounts.
 4. Display the total amount spent.
 5. End the program.
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Python Program:

```
# Program to calculate total expenses of Karan

# Step 1: Assign expenses
books = 150
groceries = 220
transport = 90

# Step 2: Calculate total
total_expense = books + groceries + transport

# Step 3: Display the result
print("Total expenses incurred by Karan: ₹", total_expense)
```

Sample Input:

(Values are already assigned in the program — no manual input required.)

```
Books = ₹150
Groceries = ₹220
Transport = ₹90
```

Sample Output:

```
Total expenses incurred by Karan: ₹ 460
```

1.2 Write a BMI calculator. Ask the user for weight (kg) and height (m), then calculate and display their BMI.

Aim:

To write a Python program that calculates and displays the Body Mass Index (BMI) of a person using their weight (in kilograms) and height (in meters).

Algorithm:

1. Start the program.
2. Prompt the user to input their **weight in kilograms**.
3. Prompt the user to input their **height in meters**.
4. Calculate BMI using the formula:

$$\text{BMI} = \frac{\text{weight}}{\text{height}^2}$$

5. Display the calculated BMI.
 6. End the program.
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Python Program:

```
# BMI Calculator

# Step 1: Get input from the user
weight = float(input("Enter your weight in kilograms: "))
height = float(input("Enter your height in meters: "))

# Step 2: Calculate BMI
bmi = weight / (height ** 2)

# Step 3: Display result
print("Your Body Mass Index (BMI) is:", round(bmi, 2))
```

Sample Input:

Enter your weight in kilograms: 70
Enter your height in meters: 1.75

Sample Output:

Your Body Mass Index (BMI) is: 22.86
1.3 Laya wants to calculate the area of a **scalene triangle** with sides of length 8 cm, 6 cm, and 4 cm.
Help her write a Python program that computes the area using **Heron's formula**.

Aim:

To write a Python program to find the area of a triangle when the lengths of all three sides are given, using **Heron's formula**.

Algorithm:

1. Start the program.
2. Accept or assign the lengths of the three sides: **a**, **b**, and **c**.
3. Calculate the semi-perimeter:

$$s = \frac{a + b + c}{2}$$

4. Use Heron's formula to calculate the area:

$$\text{Area} = \sqrt{s(s - a)(s - b)(s - c)}$$

5. Display the area of the triangle.
 6. End the program.
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Python Program:

```
import math

# Step 1: Assign side lengths
a = 8
b = 6
c = 4

# Step 2: Calculate semi-perimeter
s = (a + b + c) / 2

# Step 3: Apply Heron's formula
area = math.sqrt(s * (s - a) * (s - b) * (s - c))

# Step 4: Display result
print("The area of the triangle is:", round(area, 2), "square cm")
```

Sample Input:

(Values are already assigned)

```
Side a = 8 cm
Side b = 6 cm
Side c = 4 cm
```

 **Sample Output:**

The area of the triangle is: 11.62 square cm