# Problem 1:

# Write a C++ program that calculates and displays a person’s body mass index (BMI). The BMI is often used to determine whether a person with an inactive lifestyle is overweight or underweight for his or her height. A person’s BMI is calculated with the following formula:

# *BMI* = *Weight* × 703 / *Height*2

# where *weight* is measured in pounds and *height* is measured in inches .Take weight and height of a person as an input from the user. The program should display a message indicating whether the person has optimal weight, is underweight, or is overweight. An inactive person’s weight is considered optimal if his or her BMI is between 18.5 and 25. If the BMI is less than 18.5, the person is considered underweight. If the BMI value is greater than 25, the person is considered overweight.

**Problem 2:**

Write a C++ program that inputs the values of two sides of a shape. If both side values are equal, it displays that the shape is a square, and then calculates the area and the perimeter of that square. If both sides are different, it displays that the shape is a rectangle, and then calculates the area and the perimeter of that rectangle.

# Two sample runs of this program are:

|  |
| --- |
| **Enter the value for length: 5**  **Enter the value for width: 5**  **Your shape is a Square.**  **The perimeter of this square is: 20, and area is: 25.**  **Enter the value for length: 5**  **Enter the value for width: 10**  **Your shape is a Rectangle.**  **The perimeter of this rectangle is: 30, and area is: 50.** |

# HINTS: Perimeter of a rectangle = 2 x (length + width), and area of a rectangle = length x width.

Perimeter of a square = **4 x side**, and area of a square = **side2**.

**Problem 3:**

# Write a program that reads in three integers and prints “in order” if they are sorted in ascending *or* descending order, or “not in order” otherwise. The sample output is given below:

|  |
| --- |
| 1 2 5 in order1 5 2 not in order5 2 1 in order1 2 2 in order |

**Problem 4:**

# Write a C++ program that reads in the salary of an employee. Here the salary will denote an *hourly* wage, such as $9.25. Then ask how many hours the employee worked in the past week. Be sure to accept fractional hours. Compute the pay. Any overtime work (over 40 hours per week) is paid at 150 percent of the regular wage. Print a paycheck for the employee.