TP4-Condition 2

Lab's objectives:

- Using basic condition
- Using nested conditions

Deadline: 6 days

Problem1: Write a program to test a valid date. A user is asked to input a date in this format: yyyy-mm-dd (eg.: 2023-10-25). The program tells whether the input date is valid or not.

Hint: Test different cases for range of valid year, range of valid month, and range of valid day which is depending on the month (some months may have 31 days, 30 days, 29 days, or 28 day, …etc)

Examples:

INPUT:

Enter a date (yyyy-mm-dd): 2023-10-25

Output:

The given date 2023-10-25 is a valid date.

……

INPUT:

Enter a date (yyyy-mm-dd): 2004-02-30

Output:

The given date 2004-02-30 is INVALID.

Problem2: Write a program to find the smallest among 4 numbers.

INPUT:

Enter 4 numbers: 10 20 -1 75

Output:

Among these 4 input numbers (10, 20, -1 and 75), the smallest is -1

Hint: To get 4 input numbers at the same time, you can use multiple placeholders in the **scanf** separated by spaces.

To store 4 input numbers in the variables num1, num2, num3, and num4, try this:

scanf("%d %d %d %d", &num1, &num2, &num3, &num4);

Problem3: Create a program that simulates a simple rock-paper-scissors game.

INPUT:

Enter option (rock, paper, scissor) by player 1: rock

Enter option (rock, paper, scissor) by player 2: paper

Output:

The player 2 won the player 1 because *paper* wins *rock*.

……

INPUT:

Enter option (rock, paper, scissor) by player 1: scissor

Enter option (rock, paper, scissor) by player 2: scissor

Output:

The player 1 & 2 are equal because they have the same scissor.

Note: In this game, rock wins scissor, paper wins rock, and scissor wins paper.

Problem4: Write a program to determine if a given string is a palindrome.

INPUT:

Enter a string: RADAR

Output:

The word RADAR is a palindrome

……

INPUT:

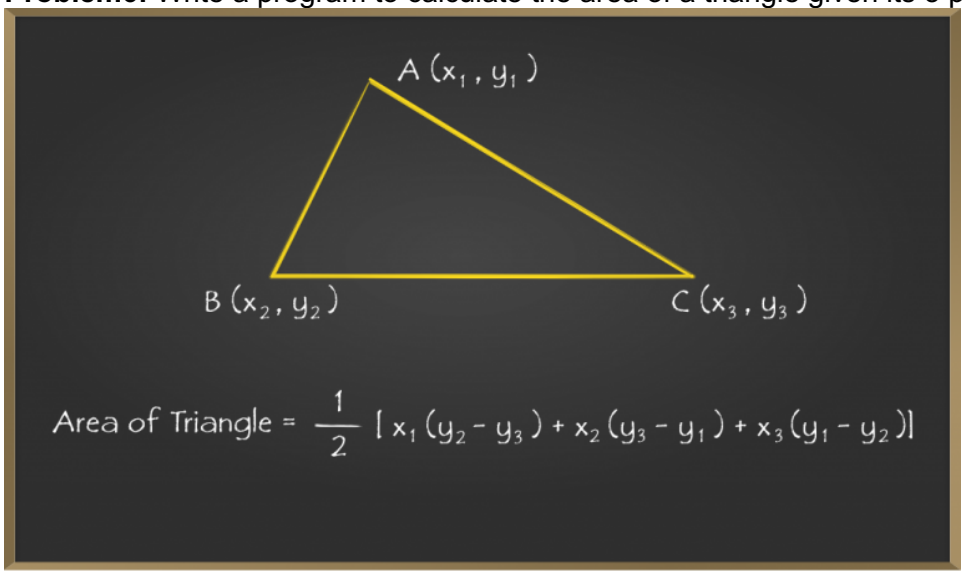
Enter a string: HELLO

Output:

The word HELLO is not a palindrome

Note: A string is palindrome when that string written in a reserve order is still the same. E.g: refer, madam, radar, level, kayak, …..etc.

Problem6: Write a program to calculate the area of a triangle given its 3 points A, B and C.



The program tell message to the user as follows:

When the area is less than 3, display this message “it is a small triangle”.
When the area is in between [3, 10], display this message “it is a medium-size triangle”.
When the area is larger than 10, display this message “it is a large triangle”.

INPUT:

Enter coordinate x and y of point A: 1 2
Enter coordinate x and y of point B: 4 2

Enter coordinate x and y of point C: 3 5

Output:

The area of this triangle with point A(1,2), B(4,2) and C(3,5) is **4.5 square units.**

……

Problem8: Create a program that determines the day of the week for a given date.

INPUT:

Enter a valid date (yyyy-mm-dd): 2023-12-25

Output:

It is day 4 of week 4 of the month.

Note: Zeller's Congruence is an algorithm devised by Christian Zeller to calculate the day of the week for any date. The algorithm provides a formula that takes the year, month, and day as input and produces an integer representing the day of the week. The result is usually an integer from 0 to 6, where 0 corresponds to Saturday, 1 to Sunday, and so on.

1. Adjustment for January and February:

If the month is January or February, it is treated as months 13 and 14 of the previous year (month+=12).

2. Calculation of day of the weeks: formula:

= (day + (13 * (month + 1)) / 5 + year + year / 4 - year / 100 + year / 400) % 7

3. Week of the month: (day+ 6) / 7