Name: Rem Sokvipha

ID: e20231056

Assignment TP4

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.

Code:

tp4(1).c > main()

```c
#include<stdio.h>
#include<math.h>

int main(){

    printf("This program will tell you whether the date is valid or invalid\n");
    int year,month,day;
    printf("Enter number of year:"); scanf("%i", &year);
    printf("Enter number of month:"); scanf("%i", &month);
    printf("Enter number of day:"); scanf("%i", &day);

    if(year>=1 && year<=2024){
        if(month==1 || month==3 || month==5 || month==7 || month==8 || month==10 || month==12){
            if(day>=1 && day<=31){
                printf("BRAVO!! The date is valid.");
            }
            else{
                printf("The date is invalid.");
            }
        }
        else if(month==4 || month==6 || month==9 || month==11){
            if(day>=1 && day<=30){
                printf("BRAVO!! The date is valid.");
            }
            else{
                printf("The date is invalid.");
            }
        }
```

```
        else if(month==2){
            if(year%4==0){
                if(day>=1 && day<=29){
                    printf("BRAVO!! The date is valid.");
                }
                else{
                    printf("The date is invalid.");
                }
            }
            else{
                if(day>=1 && day<=28){
                    printf("BRAVO!! The date is valid.");
                }
                else{
                    printf("The date is invalid.");
                }
            }
        }
        else{
            printf("The date is invalid.");
        }
    }
    else{
        printf("The date is invalid.");
    }

}
```

Result:

```
This program will tell you whether the date is valid or invalid
Enter number of year:2023
Enter number of month:10
Enter number of day:25
BRAVO!! The date is valid.
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

```
This program will tell you whether the date is valid or invalid
Enter number of year:2004
Enter number of month:2
Enter number of day:30
The date is invalid.
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

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);

Code:

```c
#include<stdio.h>
#include<math.h>

int main(){

    int num1, num2, num3, num4;
    printf("Enter four numbers:");
    scanf("%i %i %i %i", &num1, &num2, &num3, &num4);

    if(num1<=num2 && num1<=num3 && num1<=num4){
        printf("Among (%i, %i, %i, %i) the smallest number is %i", num1, num2, num3, num4, num1);
    }
    else if(num2<=num1 && num2<=num3 && num2<=num4){
        printf("Among (%i, %i, %i, %i) the smallest number is %i", num1, num2, num3, num4, num2);
    }
    else if(num3<=num1 && num3<=num2 && num3<=num4){
        printf("Among (%i, %i, %i, %i) the smallest number is %i", num1, num2, num3, num4, num3);
    }
    else{
        printf("Among (%i, %i, %i, %i) the smallest number is %i", num1, num2, num3, num4, num4);
    }

}
```

Result:

```
Enter four numbers:10 20 -1 75
Among (10, 20, -1, 75) the smallest number is -1
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_T
P4>
```

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.

Code:

```c
#include<stdio.h>
#include<string.h>
int main(){

    printf("Rock Paper Scissors program\n");
    char n1[10], n2[10];
    printf("Enter option (Rock Paper Scissors) of player 1:"); scanf("%s", &n1);
    printf("Enter option (Rock Paper Scissors) of player 2:"); scanf("%s", &n2);

    if(strcmp(n1,"rock")==0 && strcmp(n2,"paper")==0){
        printf("Player 2 wins.");
    }
    else if(strcmp(n1,"rock")==0 && strcmp(n2,"scissors")==0){
        printf("Player 1 wins.");
    }
    else if(strcmp(n1,"paper")==0 && strcmp(n2,"rock")==0){
        printf("Player 1 wins.");
    }
    else if(strcmp(n1,"paper")==0 && strcmp(n2,"scissors")==0){
        printf("Player 2 wins.");
    }
    else if(strcmp(n1,"scissors")==0 && strcmp(n2,"paper")==0){
        printf("Player 1 wins.");
    }
    else if(strcmp(n1,"scissors")==0 && strcmp(n2,"rock")==0){
        printf("Player 2 wins.");
    }
    else if(strcmp(n1,"rock")==0 && strcmp(n2,"rock")==0){
        printf("Player 1 & 2 are equal.");
    }
```

```
31      else if(strcmp(n1,"scissors")==0 && strcmp(n2,"scissors")==0){
32          printf("Player 1 & 2 are equal.");
33      }
34      else if(strcmp(n1,"paper")==0 && strcmp(n2,"paper")==0){
35          printf("Player 1 & 2 are equal.");
36      }
37      else{
38          printf("Invalid input!!");
39      }
40  }
```

Result:

```
Rock Paper Scissors program
Enter option (Rock Paper Scissors) of player 1:rock
Enter option (Rock Paper Scissors) of player 2:paper
Player 2 wins.
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

```
Rock Paper Scissors program
Enter option (Rock Paper Scissors) of player 1:scissors
Enter option (Rock Paper Scissors) of player 2:scissors
Player 1 & 2 are equal.
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

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

Code:

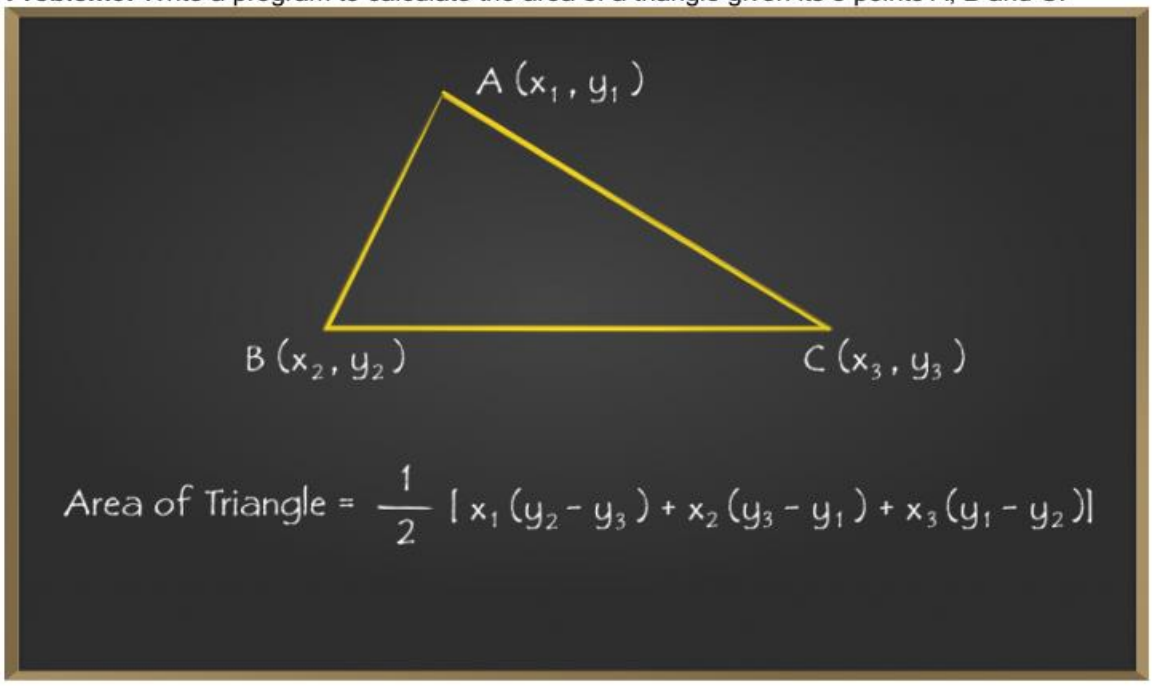
```c
#include<stdio.h>
#include<string.h>
int main(){
    printf("Verify the words if it's palindrome.\n");
    char word[20];
    printf("Enter your word:"); scanf("%s", &word);
    int count=strlen(word);
    if(word[0]==word[count-1]){
        strrev(word);
        printf("Your word after reverse is %s\n", word);
        printf("Thus %s is palindrome", word);
    }
    else{
        printf("%s is not palindrome", word);
    }
}
```

Result:

```
Verify the words if it's palindrome.
Enter your word:radar
Your word after reverse is radar
Thus radar is palindrome
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

```
Verify the words if it's palindrome.
Enter your word:hello
hello is not palindrome
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```

Problem5: 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. It is a medium-size triangle.

.....

Code:

```c
#include<stdio.h>
#include<math.h>

int main(){
    int Xa, Ya, Xb, Yb, Xc, Yc;
    printf("Enter coordinate of point A:"); scanf("%i %i", &Xa, &Ya);
    printf("Enter coordinate of point B:"); scanf("%i %i", &Xb, &Yb);
    printf("Enter coordinate of point C:"); scanf("%i %i", &Xc, &Yc);

    float area=(Xa*(Yb-Yc)+Xb*(Yc-Ya)+Xc*(Ya-Yb))/2.0;
    printf("The area of triangle with point A(%i,%i), B(%i,%i) and C(%i,%i) is %f\n", Xa, Ya, Xb, Yb, Xc, Yc, area);

    if(area<=3.00){
        printf("It's a small size triangle.\n");
    }
    else if(area>=3.00 && area<=10.00){
        printf("It's a medium size triangle.\n");
    }
    else{
        printf("It's a big size triangle.\n");
    }
}
```

Result:

```
Enter coordinate of point A:1 2
Enter coordinate of point B:4 2
Enter coordinate of point C:3 5
The area of triangle with point A(1,2), B(4,2) and C(3,5) is 4.500000
It's a medium size triangle.
PS C:\Users\Vipha\OneDrive\Documents\I2 2024-2025\SDP_TP4>
```