TP6-Using loop *while*

Lab's objectives:

- Using loop while

Deadline: 6 days

Problem1: Write a program to display all even numbers in this range [2, 2000] using a while loop.

Example:

Output:

All even numbers between [2, 2000] are: 2 4 6 8 10 …… 2000

Problem2: Write a program that prints the powers of 2 up to 2^10 (1024) using a while loop.

Example:

Output:

2^0 = 0
2^1 = 2
2^2 = 4
2^3 = 8
2^4 = 16
2^5 = 32
2^6 = 64
2^7 = 128
2^8 = 256
2^9 = 512
2^10 = 1024

Problem3: Write a program to ask a user for two integer numbers **m** and **n**. The program computes summation of numbers starting from m to n using a while loop.

Examples:

INPUT:

Enter a number m: 5
Enter a number n: 10

Output:

The sum is: 5+6+7+8+9+10 = 45

……

INPUT:

Enter a number m: 8
Enter a number n: 2

Output:

Oop! We can not compute the summation. n must be bigger than m.

Problem4: Write a program to ask a user to input a number. Keep asking the user to input another number if yet not input the number 0. When the user input 0, the program stops and display total summation of all input numbers.

Examples:

INPUT:

Enter a number: 5
Enter a number: 10
Enter a number: 2
Enter a number: 1
Enter a number: -1
Enter a number: 0

Output:

The sum of all input numbers is 17

……

INPUT:

Enter a number: 20
Enter a number: 0

Output:

The sum of all input numbers is 20.

Problem5: Write a program to ask a user for an integer number n less than 10000. The program tells the user how many digits that this number has. **Hint**: Use a while loop. Divide the number by 10 until reaching 0. Each time, try to increase a counter variable which represents the number of digits.

Examples:

INPUT:

Enter a number n: 552

Output:

This number 552 has 3 digits.

……

INPUT:

Enter a number n: 20021

Output:

This number 20021 has 5 digits.

Problem6: Generate one random number. Then create a simple number guessing game where the user has to guess a number between 1 and 10. Use a while loop to continue prompting the user until they guess correctly. The program stops when the user guesses it correctly and tells the user how many that he/she has tried guessing.

Hint:
-The program randoms a number between 1 and 15. The user input a number to guess. In your program, you add a logic that when the user input is the same as the randomized number, the program stops.
-In order to generate a random number in C programming, we use the **rand()** function. To get the different number when random again, the **srand(time(0))** is used. You can find a simple code for generating a random number in the range of [1, 20].

```c
#include<stdio.h>
#include<time.h>
main(){
    srand(time(0));
    int start=1, end=20;
    int n;

    n = rand()%end + start;
    printf("%d ",n);
}
```

Example: Assume that the random number generated from the program is 10.

```
Enter a guess number between 1-15: 8
        Not correct! Try to guess again!

Enter a guess number between 1-15: 5
        Not correct! Try to guess again!

Enter a guess number between 1-15: 15
        Not correct! Try to guess again!

Enter a guess number between 1-15: 10
       *** Congratulations! Your guess number is correct!
You have try 4 time to get it right!

Process returned 0 (0x0)   execution time : 15.957 s
Press any key to continue.
```