Week 2: DAY 3 - Home Task
Number Sequences with For Loop and Functions

Problem 0 (Display following Sequences)

Write a program which prints all the numbers in the following sequences upto 'N' (asked from the user).

- **1, 3, 5, 7, 9, 11,...**
- **1, 5, 25, 125,...**
- **1, 3, 9, 27, 81,...**
- **1, 4, 8, 11, 22, 25, 50, 53,...**
- **(N), (N-1), (N-2), ..., 3, 2, 1**
- **512(N), 256(N/2), 128,..., 1**
- **1, 1, 3, 6, 5, 11, 7, 16, 9, 21, ...**
- **1, 100, 2, 99, 3, 98, 4, 97, ..., 100, 1**
- **0, 0, 4, 8, 8, 16, 12, 24, 16, 32, ...**
- **10, 20, 15, 22, 20, 24, 25, 26, 30, ...**
- **1, 1, 2, 4, 6, 9, 24, 16, 120, 25, ...**

Problem 1 (Even Odd)

Write a program that takes inputs until the user enters -1 and your program tells the frequency of even and odd numbers.

Problem 2 (Maximum Minimum)

I. Write a program that takes inputs until the user enters -1 and your program tells the maximum and minimum number.

II. Write a program that takes unique integers as inputs until the user enters -1 and your program tells the maximum and 2nd maximum entered till the end.

Problem 3 (Primes)

I. Write a function which takes a number N and tells whether N is a prime number or not (make a function which returns true when N is a prime)

II. Extend I) to take the first H, which means it will ask user H inputs and tells about each number whether it is prime or not.

III. Extend I) and write a Program which takes a Number N and tells it's all prime factorization (make a separate function PrintPrimeFactors which prints all the prime a factorization)

IV. Write a program which takes a composite number N and tells its largest prime factor (make a function that returns the largest prime factor)

V. Print all prime numbers between a given range asked from the user
R1-R2: 10 20
The prime number between 10 to 20 are: 11 13 17 19

Problem 4 (Fibonacci Numbers)

I. Write a function which takes as parameter N>=0 and tells (returns) Nth Fibonacci number
e.g. **Fn = Fn-1 + Fn-2, F0 = 0, F1 = 1** http://en.wikipedia.org/wiki/Fibonacci_number
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55.....

II. Write a program that takes input **'k'** from the user which means the user is interested in **k Fibonacci numbers** and then ask again one by one these k Fibonacci numbers who wants to

know. (Reuse part I)

Input Format:

How many Fibonacci Numbers you want to ask: 3
Which Fibonacci: 6
F6= 8
Which Next Fibonacci: 3
F3 = 2
Which last Fibonacci you want to ask is: 4
F4 = 3

III. Write a program which takes as parameter '**T**' and prints all the **Fibonacci numbers less than T**. (Reuse part I)

Sample Input: **You want to Print Up to: 50**
Sample Output: **The Sequence Up to <50 is: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34**

IV. Write a program which takes two parameters **Start** and **End** and prints all the Fibonacci numbers between them. (Reuse part I)

V. By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Problem 5 (Natural Numbers)

Write a program which adds all the natural numbers below 3000 and greater than 500 that are multiples of 3 or 5 but not both.

Problem 6 (Triangle Numbers)

I. Write a Function which takes as parameter N and returns Nth Triangle Number.

II. Write a program(using ii) which prints the triangle Numbers sequence up to M (asked from the user),

NOTE: The sequence of triangle numbers is generated by adding the natural numbers. So the **7th triangle number would be 1 + 2 + 3 + 4 + 5 + 6 + 7 = 28.**

The first ten terms of triangle number would be: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, ...

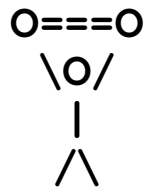
Problem 7 (GCD)

I. Write a function which takes two numbers and returns its Greatest Common Divisor (GCD)

NOTE: GCD of two numbers is the largest number that divides both of them. For Example:

GCD of 20 and 28 is 4 **GCD of 98 and 56 is 14**

II. Write a program that takes a number **n** from the user and then takes **n** inputs from the user and finds their GCD, Reuse the I) part.



Happy Coding... :)

Good luck