Tutorial 2

Exercise 1. User profiling.

Write a program that does the following:

1. Reads name, age and height of a person.
2. Check whether his name is long ($>$ 20 characters), semi long ($>$ 15 characters), semi-short (8, 9 or 10 characters) or short (less than 8 characters)
3. Prints whether the person is an adult or not (more than 18 years old)
4. Prints whether the person is tall or not (more than french average of 172cm)

Exercise 2. is_negative, is_odd and is_prime.

Write a program that checks the following:

1. If a number is negative or positive.
2. If a number is odd or even.
3. If a number is prime or not.
4. Write a program that counts the number of odd and even numbers in a series of numbers. Write a program that counts the number of prime numbers in a series of numbers.

Exercise 3. Password checker.

In order to secure our accounts, we have to use complicated passwords that respect certain conditions, we want to help users choose a powerful password using our password checker, write a program that reads a password from the user and ensures that it respects the following rules:

- At least 2 letters between [a-z] and 2 letters between [A-Z].
- At least 2 numbers between [0-9].

- At least 1 character from [$#@].
- Minimum length 6 characters.
- Maximum length 16 characters.

The program should print the rules that are not respected in case the password is not valid.

Exercise 4. Guessing game.

We want to build a guessing game that asks the user to guess a number between 0 and 100, write a program that:

1. Generates a random number using the **randint** function in the **random** module.
2. Asks the user to guess the number and point out whether his number is bigger or smaller than the correct number until he / she gets it right.
3. Returns the number of guesses the user made in order to get the correct answer.

Exercise 5. Fibonacci sequence

The Fibonacci sequence is a sequence of integers in which each term is the sum of the two preceding terms: $U_n = U_{n-1} + U_{n-2}$. It starts with the two terms $U_0 = 0$ and $U_1 = 1$. Thus, the first 7 terms of this sequence are: 0, 1, 1, 2, 3, 5, 8.

Write a program to calculate the Fibonacci sequence for a number given by the user.

Exercise 6. Binomial coefficients

Write a program to compute the combinations: $C_n^p = C_{n-1}^{p-1} + C_{n-1}^p$ for n and p given, with $0 < p < n$. Boundary conditions: $C_0^0 = 1 = C_i^0 = C_i^i$.

Exercise 7. Text analysis

Write a program that allows you to :

- Calculate the number of words in a text entered by the user.
- Count the number of vowels in the same text.
- Count words containing only two or more vowels.