07. Functions and recursion

7.01. Write a function which takes three numbers and returns if the smallest one of them is prime.

7.02. Write a function which takes a character and returns if the character is either digit or letter.

7.03. Write a function which takes four numbers - coordinates of two $2D$ points - $A(x_1, y_1)$, $B(x_2, y_2)$ and returns the distance between A and B.

7.04. Write a function which takes six numbers - coordinates of three points in $2D$, and returns if they lie on a straight line.

7.05. Write a function which takes three numbers - coordinates of a $3D$ vector, and returns the length of the vector.

7.06. Write a function which by a given real number x and a non-negative integer n returns x raised to the n-th power. Use Karatsuba multiplication method (recursion).

7.07. Write a program which asks the user for a non-negative integer n and gives the $n-th$ number of *Fibonacci*.

7.08. Write a program which asks the user for a number n and prints the first n numbers of *Tribonacci*.

7.09. Write a program which asks the user for a non-negative integer $n$and gives the n-th number of the sequence $a_{n+2} = 5a_{n+1} - 6a_n + 6^n$, with $a_0 = 0 \ \ a_1 = 1$.

7.10. Write a function which takes one integer n and returns $n!$.

7.11. Write a program which asks the user for the numbers $0 \le k \le n$ and prints the number of combinations $\binom{n}{k}$. Hints: $\binom{n}{k} = \dfrac{n!}{k!(n-k)!} = C_n^k$, also $C_n^0 = C_n^n = 1$ and $C_n^k = C_{n-1}^k + C_{n-1}^{k-1}$.

7.12. Write a function which by given n, finds the number of solutions of the system in natural numbers $\mathbb{N} \cup 0$:

$$\begin{cases} x_1 + x_2 + x_3 + X_4 + x_5 = n \\ x_1 < 10 \\ 1 - \leq x_2 < 30 \\ x_4 > 20 \\ x_5 < 30 \end{cases}$$

Example input	Expected output
30	0
31	1
32	5
100	249000

7.13. Write a function which takes two integers, which are not all zero, and returns the largest positive integer that divides each of the integers (*greatest common divisor*). For example, the **GCD** of 8 and 12 is 4. Use [Euclid's algorithm](https://en.wikipedia.org/wiki/Euclidean_algorithm "Markdown Tutorial").

7.14. Write a function which calculates the value of a given polynomial using [Horner's method](https://en.wikipedia.org/wiki/Horner%27s_method "Markdown Tutorial").