Matlab: Task 1 (5 points)

- Construct a vector $y=\sin(x)\cos(2x)\mathrm{e}^{0.04x}$ for a vector x ranging from -2π and 2π with a step of 0.01

- Plot the vector y as a function of the vector x (y on the y-axis and x on the x-axis)
- Find the minimum and maximum of the vector y (the value y in the maximum and minimum and the positions along the vector x for which the maximum and minimum occured)

Matlab: Task 2 (5 points)

- Construct a vector $y=0.1x^2+0.5x+2$ for a vector x ranging from -4 to 4 with a step of 0.1
- Add random noise to the vector y (use **randn** function for Gaussian random noise with zero mean and variance equal to 1)
- Fit a polynom of the second degree to the y vector plus generated noise data (use **polyfit** function)
- Plot the vector y, vector y + added noise, and fitted polynomial (use **polyval** function) in the same figure.

Matlab: Task 3 (10 points)

- Write a function which will calculate Fibonnachi sequence https://en.wikipedia.org/wiki/Fibonacci_number
- In the sequence, the first number F(0) = 0, the second number F(1) = 1 and every other n-th number (n>0) is F(n) = F(n-1) + F(n-2)
- The function parameter will define the maximal upper limit (the largest number in the sequence must be smaller than the limit, such that if you added another element of the sequence, the number would be larger than the limit).
- Write a Matlab script in which you call the function returning the Fibonnachi sequence for the parameter value 1000 (the upper limit of the sequence) and plot the sequence in a graph (n on the x-axis)