Tasks for 05/09/2022:

*** Gauss-Seidel method:** Consider the set of algebraic linear equations,

$$a_{11}x_1 + a_{12}x_2 + \cdots + a_{1n}x_n = b_1$$

$$a_{21}x_1 + a_{22}x_2 + \cdots + a_{2n}x_n = b_2$$

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$$a_{n1}x_1 + a_{n2}x_2 + \cdots + a_{nn}x_n = b_n$$

Where the coefficients and constants are given by
A =[-6 2 1 2 1;
3 8 -4 1 0;
-1 1 4 10 1;
3 -4 1 9 2;
2 0 1 3 10]

And the coefficient matrix is given by b = [3; 4; -2; 12;1].

a) Write a code to see is the matrix *A* is diagonally dominant.

b) Write a code for solving this equation using Gauss-Seidel method in which the convergence is achieved if error limit in successive iteration is within 0.001.

***Linear interpolation 1:** Given the three data points (*x*, *y*) = (1.0, 8.0), (2.1, 20.6) and (5.0, 13.7), write a program to return the value of y for any arbitrary *x* in the range [1.0, 5.0] using two-point linear interpolation.

***Linear interpolation 2:** Write a code for two-point segment linear interpolation for the dataset given in file points.txt (attached)