**IT3-2208 Zhenisov Zhanserik**

**Lab 2. Gauss method**

Срок заканчивается 16 сентября 2024 г., 0:00

**Инструкции**

Solve the SLAE using the Gauss method. Implement the method on your own.

Submit the report in word (.docx) or .pdf format, including:

1. Code of implementation. (Without any supplementary libraries). (50%)
2. Output of the program. (25%)
3. Solution by hand (using the same example as in your code). (25%)

The code should check for the moment when we have zero in the diagonal element. If so, provide the solution for that case. If the solution is not provided -10%.

1. def gaussian\_elimination(A, b):  
    n = len(b)  
     
    for i in range(n):  
    max\_row = i  
    for k in range(i + 1, n):  
    if abs(A[k][i]) > abs(A[max\_row][i]):  
    max\_row = k  
     
    A[i], A[max\_row] = A[max\_row], A[i]  
    b[i], b[max\_row] = b[max\_row], b[i]  
     
    for k in range(i + 1, n):  
    factor = A[k][i] / A[i][i]  
    for j in range(i, n):  
    A[k][j] -= factor \* A[i][j]  
    b[k] -= factor \* b[i]  
     
    x = [0 for \_ in range(n)]  
    for i in range(n - 1, -1, -1):  
    x[i] = b[i] / A[i][i]  
    for k in range(i - 1, -1, -1):  
    b[k] -= A[k][i] \* x[i]  
     
    return x  
     
     
   A = [  
    [1, 2, -1],  
    [2, -1, 3],  
    [1, 1, 1]  
   ]  
     
   b = [3, 15, 6]  
     
   solution = gaussian\_elimination(A, b)  
   print("Решение:", solution)
2. Решение: [5.4, -0.6000000000000003, 1.1999999999999997]
3. 