RESULTS AND EXPLANATION:

Task 1:

Write a program to generate a new matrix B from the matrix A given below such that each column in the new matrix except the first one is the result of subtraction of that column from the previous one i.e. 2nd new column is the result of subtraction of 2nd column and 1st column and so on. Copy the first column as it is in the new matrix.

$$A = \begin{bmatrix} 3 & 6 & 9 \\ 1 & 4 & 8 \\ 2 & 8 & 7 \end{bmatrix}$$

Problem Analysis:

With MATLAB, manipulating matrices is simple. Here, a matrix will be replaced with built-in formulas in MATLAB.

Algorithm:

- Write the matrix A.
- Produce a zero matrix B;
- Switch out row one of B for row one of A.
- Keep the difference between the first and second columns in c2.
- Keep the third-and-second-column difference in c3.
- Change the second and third columns of B to c2 and c3, respectively.
- Display A
- Display B

Code:

Output / Graphs / Plots / Results:

```
Command Window
  A matrix is
       3       6       9
       1       4       8
       2       8       7

  B matrix is
       3       3       3
       1       3       4
       2       6      -1

fx >>
```

Discussion and Conclusion:

With MATLAB, we can quickly replace columns and rows in matrices.

Task 2:

Generate two 5000 samples random discrete time signals (1 dimensional) using rand () function i.e. rand (1, 5000). Write a program to add two signals together using simple vector addition.
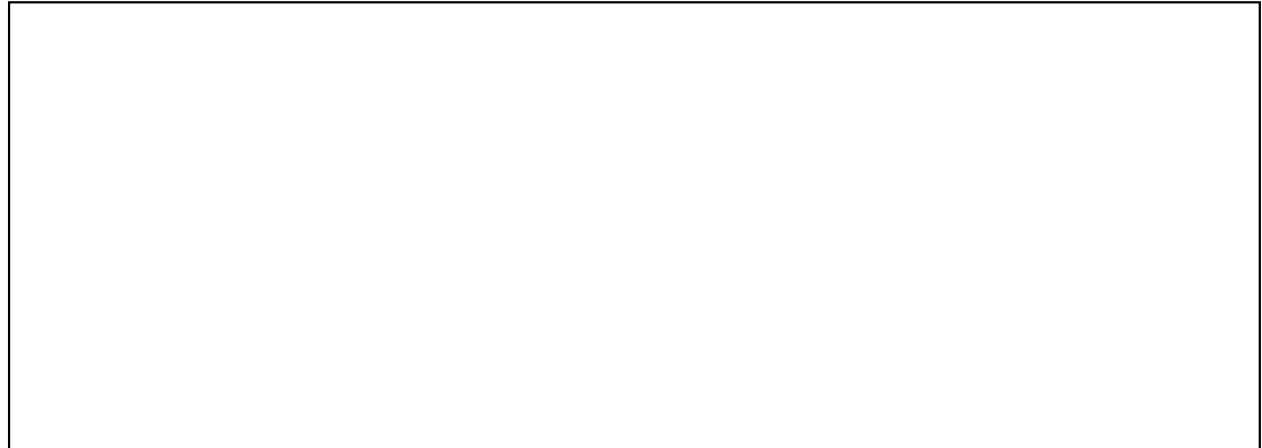
Problem Analysis:

MATLAB is able to work with vectors and signals as well. Here, we use rand to create signals, which we then put in a vector for vector addition.
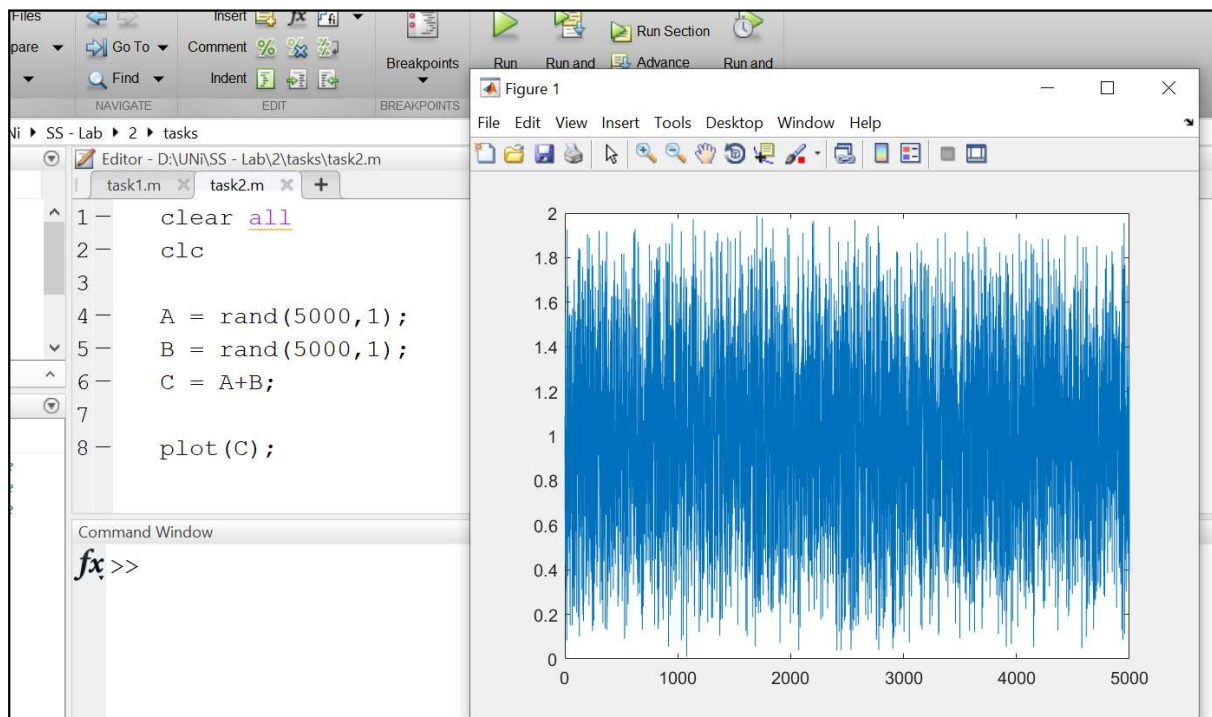
Algorithm:

- Create a random signal of 1-5000 discrete values and store it in A
- Create a random signal of 1-5000 discrete values and store it in B
- Add A and B and store it in C
- Display C

Code:

Output / Graphs / Plots / Results:

Discussion and Conclusion:

MATLAB is particularly effective at handling both vectors and temporal signals. We can quickly convert discrete time domain values to vectors by applying a few straightforward formulas and routines.

Task 3:

Using colon notation, generate the following sequence:
-120, -116, -112, . . ., -4, 0, 4, 8, . . ., 112, 116, 120

Problem Analysis:

In addition to signal synthesis, MATLAB makes it simple to create random and fixed sequences.

Algorithm:

- Make a sequence x which ranges from -120 to 120 with and increment of 4
- Display the sequence

Code: