TASK SHEET

1. Create a 5x5 matrix with random values and replace all the elements greater than a given threshold with the threshold value.

Example: Threshold = 0.5, replace elements greater than 0.5 with 0.5.

1. Generate a 1D array of 20 random integers between 1 and 100. Find the indices of the elements that are even.
2. Create a 3x3 identity matrix and convert its diagonal elements to the square of the respective indices (0, 1, 2).
3. Given a 1D array, normalize the array (i.e., scale the values such that the maximum value is 1 and the minimum value is 0).
4. Create a 4x4 matrix with random integers and replace the diagonal elements with the sum of their row.
5. Generate a 1D array of 15 random numbers between 0 and 1. Sort the array in descending order without using the built-in sort function.
6. Create a 6x6 matrix and fill it with a checkerboard pattern (alternating 0s and 1s).
7. Given two 1D arrays, find the common elements between them.
8. Generate a random 5x5 matrix and find the sum of the elements in the lower triangular part of the matrix (including the diagonal).
9. Create a 1D array of 20 random integers between 1 and 50. Replace the maximum value with -1.
10. Given a 2D array, find the column-wise mean of the array.
11. Create a 3x3 matrix with values ranging from 1 to 9 and rotate the matrix 90 degrees clockwise.
12. Create a 1D array of 10 random numbers. Find and print the cumulative sum of the elements.
13. Given a 2D array, subtract the mean of each row from the respective row elements.
14. Create a 5x5 matrix and set the elements in the border to 1 and the rest to 0.
15. Generate a random 4x4 matrix and replace all elements that are less than the mean of the matrix with zero.
16. Given a 1D array, find the difference between each pair of consecutive elements.
17. Create a 6x6 matrix with random values and calculate the sum of the elements in the secondary diagonal (bottom-left to top-right).
18. Given a 2D array, find the row with the maximum sum of elements.
19. Create a 4x4 matrix with random values and replace the elements above the main diagonal with their negative value.