Class Assignments – 3

1.

Create the following matrix A: $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 2 & 4 & 6 & 8 & 10 & 12 & 14 \\ 21 & 18 & 15 & 12 & 9 & 6 & 3 \\ 5 & 10 & 15 & 20 & 25 & 30 & 35 \end{bmatrix}$

a) Create a 3×4 matrix B from the 1st, 3rd, and 4th rows, and the 1st, 3rd, 5th, and 7th columns of the matrix A.

b) Create a 15 elements-long row vector u from the elements of the third row, and the 5th and 7th columns of the matrix A.

2.

Using the `zeros`, `ones`, and `eye` commands create the following arrays:

a) $\begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$ *b*) $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ *c*) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \\ 1 & 1 \end{bmatrix}$

3.

Create a 5×7 matrix in which the first row are the numbers 1 2 3 4 5 6 7, the second row are the numbers 8 9 10 11 12 13 14, the third row are the numbers 15 through 21, and so on. From the this matrix create a new 3×4 matrix that is made from rows 2 through 4, and columns 3 through 6 of the first matrix.

4.

Define a vector **t** of 6 random integers in the range $-7 \leq t \leq 15$. Sort them in a descending order.

5.

Create the following matrix D:

1	1	2	2	2
1	1	2	2	2
3	4	4	5	5
3	4	4	5	5
3	4	4	5	5

6.

a. Build a matrix A 3X4 containing random, one digit integers.

b. Replace the number in the second row forth column with 15.

c. Replace the number in the third row first column with 12.

d. Enlarge matrix A by adding 4 rows and 1 columns, insert 14 in seventh row fifth column, all other added places should contain zeros . Save the new matrix in B.

e. Add to matrix A a new fifth column, the variables of this column will be the same as the variables of the second column of A.

f. Build a new matrix D that contains A and paste the matrix B beneath.

g. Remove the rows 2, 8 and 5 from D. Save this new matrix as G.

i. Find the maximum and the minimum values of D. Save the values in Dmax and Dmin.

7.

Expand matrix m1 into m2:

```
m1 =
     1     2
     3     4

m2 =
     1     2     0     0     0
     3     4     0     0     0
     0     0     0     0     0
     0     0     0     0     0
     0     0     0     0     5
```

8.

Create a 3×3 matrix A in which all the elements are 1, and create a 2×2 matrix B in which all the elements are 5. Then, add elements to the matrix A by appending the matrix B such that A will be:

$$A = \begin{bmatrix} 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 5 & 5 \\ 0 & 0 & 0 & 5 & 5 \end{bmatrix}$$

9.

Build the following array;

B =

1	2	3	4
5	6	7	8
5	5	0	0
5	5	0	0