ISE 232 HW #2

Note: In questions below, first write a pseudo code than derive MATALB code from it. Put both pseudo code and MATLAB code to your homework solution.

1) Write a function that creates a square matrix of an arbitrary size having the structure given in the example below. The size of the matrix should be taken as an argument.

1	1	1	1	1	1	1
1	0	0	0	0	0	0
1	0	1	1	1	1	1
1	0	1	0	0	0	0
1	0	1	0	1	1	1
1	0	1	0	1	0	0
1	0	1	0	1	0	1

2) Write a function that creates a square matrix of an arbitrary size having the structure given in the examples below. The size of the matrix (N) should be taken as an argument.

N=7

0	0	0	1	0	0	0
0	0	1	1	1	0	0
0	1	1	1	1	1	0
1	1	1	1	1	1	1
0	1	1	1	1	1	0
0	0	1	1	1	0	0
0	0	0	1	0	0	0

N=8

0	0	0	1	1	0	0	0
0	0	1	1	1	1	0	0
0	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1
0	1	1	1	1	1	1	0
0	0	1	1	1	1	0	0
0	0	0	1	1	0	0	0

3) Write a function that takes an integer array and returns one copy of each integer and number of occurrences of each integer in the array. The function should return the result as a matrix with two columns. The first column contains the integers and the second column contains number of occurrences of corresponding integers.

Example:

Input:

12	17	3	12	5	12	12	8	8	4	3	8

Output:

12	4
17	1
3	2
5	1
8	3
4	1

4) Write a function that takes a matrix and puts its columns into reverse order.

Example:

Input

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

Output

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

5) Write a function that takes a matrix and subtracts its first row from its all other rows.

Example:

Input:

1	3	2
4	1	8
-3	7	9
2	10	-4
1	1	5

Output:

1	3	2
3	-2	6
-4	4	7
1	7	-6
0	-2	3