LECTURE (4)

Q_1 - Write a program that multiplies the elements of the first row with the elements of the third row and places the result in another matrix,

Solution:

```
clear;
clc;
close all;
m=input('m=');
n=input('n=');
for  i=1:m
for j=1:n
a(i,j)=input('a=');
end
end
for i=1:n
c(i)=a(1,i)*a(3,i);
end
c
```

Q_2 - Write a program that multiplies the elements of the secondary diagonal by 12 for a square matrix a with dimension m.

solution:

```
clear;
clc;
m=input('m=');
for  i=1:m
for j=1:m
a(i,j)=input('a=');
end
end
a
 for i=1:m
a(i, m+1-i)=a(i,m+1-i)*12;
end
a
```

Q_3- Write a program that zero out the elements above the main diagonal of array (a).

Solution:

```
clear;
clc;
close all;
m=input('m=');
n=input('n=');
for  i=1:m
for j=1:n
a(i,j)=input('a=');
for  i=1:m
for j=1:n
if  i<j
a(i,j)=0;
end
end
% a
end
end
end
% a
```

Q4- Write a program that replaces the first row with the third column of the square matrix a.

Solution:

```
clear;
clc;
close all;
m=input('m=');
for  i=1:m
for j=1:m
a(i,j)=input('a=');
end
end
a
for  j=1:m
c=a(3,j);   % swapping
a(3,j)=a(j,3);
a(j,3)=c;
end

 a
```

Q_5 - Write a program that calculates the absolute value of negative numbers only from the vector x and stores it in the vector y.

```
clear;
clc;
close all;
m=input('length of the vector=')
for i=1:m
    x(i,1)=input('x=')
end
k=0;
for i=1:m
    if x(i,1)<0
        k=k+1;
        y(k,1)=abs(x(i,1));
    end
end
y
```

Example6// Write a program in MATLAB to generate the following matrix $\begin{bmatrix} 9 & 3 & 0 & 0 & 0 \\ 3 & 9 & 3 & 0 & 0 \\ 0 & 3 & 9 & 3 & 0 \\ 0 & 0 & 3 & 9 & 3 \\ 0 & 0 & 0 & 0 & 9 \end{bmatrix}$.

Solution:

```
clear;
clc;
zeros (5);
for i= 1:5
for j=1:5
if i==j
a(i,i)=9
elseif abs(i-j) ==1
a(i,j)=3
else
a(i,j)=0
end
end
end
```

Homework:

1- Write a program that calculates the result of raising each element from x to its corresponding element from y. Take their length n.

2- Write a program that calculates the product of multiplying each element of x by the natural logarithm of its corresponding element of y. Take the length of each of them as n.

3- Write a program to find the absolute value of each element of the matrix a, whose dimensions are m*n.

4- Write a program to calculate the square of each element of matrix b, given that its dimensions are m*1.

5- Write a program to create a new vector b, whose elements are the even values in the matrix (a).

1- اكتب برنامج يحسب حاصل رفع كل عنصر من x الى العنصر المقابل له من y ، خذ طولهما n.
2- اكتب برنامج يحسب حاصل ضرب كل عنصر من x بـــ اللوغاريتم الطبيعي للعنصر المقابل له من y ، خذ طول كل منهما هو n .
3- اكتب برنامج لإيجاد القيمة المطلقة لكل عنصر من عناصر المصفوفة a ، ابعادها m*n.
4- اكتب برنامج لحساب مربع كل عنصر من عناصر المصفوفة b علما ان ابعادها m*1.
5- اكتب برنامجًا لإنشاء متجه جديد b، عناصره هي القيم الزوجية في المصفوفة (a).