Date 1.2.24

Expt. No. 1. Page No.

PRACTICAL - 1

AIM : To write a program for demonstration of matrix addition without using function and with using function.

SOFTWARE USED : SCILAB

SOURCE CODE :

1) Without function

```
// Matrix Addition script file
clc
m=input("enter number of rows of the Matrix: ");
n=input("enter number of columns of the Matrix: ");
disp('enter the first Matrix')
for i=1:m
   for j=1:n
   A(i,j)=input('\');
    end
end
disp('enter the second Matrix')
for i=1:m
   for j=1:n
   B(i,j)=input('\');
    end
end
for i=1:m
   for j=1:n
   C(i,j)=A(i,j)+B(i,j);
    end
end
disp('The first matrix is')
disp(A)
disp('The Second matrix is')
disp(B)
disp('The sum of the two matrices is')
disp(C)
```

Teacher's Signature

OUTPUT :

```
The first matrix is

    1.    2.
    3.    4.
The second matrix is

    5.    6.
    7.    8.
The sum of the two matrices is:

    6.    8.
   10.    12.
```

OUTPUT:

```
The first matrix is

    1.    2.
    3.    4.
The second matrix is

    5.    6.
    7.    8.
The sum of the two matrices is:

    6.    8.
   10.   12.
```

2) Using Function :

```
// Matrix Addition
clc
function []=addition(m, n, A, B)
C=zeros(m,n);
C=A+B;
disp('The first matrix is')
disp (A)
disp('The Second matrix is')
disp (B)
disp('The sum of two matrices is')
disp (C)
endfunction
```

THEORY :

let A, B be two matrices of size 2×2 each

$$A = \begin{bmatrix} 1 & 6 \\ 4 & 2 \end{bmatrix} \quad , \quad B = \begin{bmatrix} 9 & 3 \\ 2 & 1 \end{bmatrix}$$

let, C be the ~~sor~~ difference of A, B

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

OUTPUT :

```
"The first Matrix is: "

 1.    6.
 4.    2.

"The second Matrix is: "

 9.    3.
 2.    1.

"The Subtraction of Matrix is: "

-8.    3.
 2.    1.
```

Expt. No. 1B

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PRACTICAL - 1B

AIM : W.A.P. to perform matrix subtraction without using function and with using function.

SOFTWARE USED : SCILAB

SOURCE CODE :

1) Without Function

```
% Matrix Subtraction script file
clc
m=input("enter number of rows of the matrix: ");
n=input("enter number of columns of the matrix: ");
disp('enter the first matrix')
for i=1:m
    for j=1:n
        A(i,j)=input('');
    end
end
disp('enter the second matrix')
for i=1:m
    for j=1:n
        B(i,j)=input('');
    end
end
for i=1:m
    for j=1:n
        C(i,j)=A(i,j)-B(i,j); % subtract corresponding elements
    end
end
disp('The first matrix is')
disp(A)
disp('The Second matrix is')
disp(B)
disp('The difference of the two matrices is') disp(C)
```

Teacher's Signature

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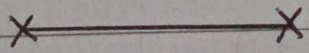
2) With using Function :

```
% Matrix Subtraction
clc
function []=subtraction(m,n,A,B)
C=zeros(m,n);
C=A-B;
disp('The first matrix is')
disp(A)
disp('The Second matrix is')
disp(B)
disp('The difference of two matrices is')
disp(C)
endfunction
```



THEORY

let, A & B be two matrices of order $m \times n$ & $p \times q$ such that, no. of columns of matrix A = no. of rows of matrix B

i.e., $n = p$ then only matrix multiplication is possible

Here, $A = \begin{bmatrix} 1 \\ 3 \end{bmatrix}_{2\times1}$

$B = \begin{bmatrix} 3 & 2 \end{bmatrix}_{1\times2}$

So, $n = p \Rightarrow 1 = 1$

$\therefore A \times B = \begin{bmatrix} 1 \\ 3 \end{bmatrix} \begin{bmatrix} 3 & 2 \end{bmatrix}$

$A \times B = \begin{bmatrix} 3 & 2 \\ 9 & 6 \end{bmatrix}$

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Expt. No. 2

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PRACTICAL - 2

AIM : WAP to perform matrix multiplication with and without using function

SOFTWARE USED - SCILAB

SOURCE CODE :

1) Without using Function :

```
// matrix multiplication script file
clc
m=input("Enter number of rows of the first Matrix: ");
n=input("Enter number of columns of the first Matrix: ");
p=input("Enter number of rows of the second Matrix: ");
q=input("Enter number of columns of the second Matrix: ");
if n==p
 disp('Matrices are conformable for multiplication')
else
  disp('Matrices are not conformable for multiplication')
  break;
end
disp('enter the first Matrix')
for i=1:m
  for j=1:n
  A(i,j)=input('');
  end
end
disp('enter the second Matrix')
for i=1:p
  for j=1:q
  B(i,j)=input('');
  end
end
C=zeros(m,q);
for i=1:m
 for j=1:q
   for k=1:n
 C(i,j)=C(i,j)+A(i,k)*B(k,j);
   end
end
end
disp('The first matrix is')
disp(A)
disp('The Second matrix is')
disp(B)
disp('The product of the two matrices is')
disp(C)
```

OUTPUT :

```
 Warning : redefining function: multiplication

-->multiplication(2,1,1,2,[1;3],[3 2])

Matrices are conformable for multiplication

The first matrix is

   1.
   3.

The Second matrix is

   3.    2.

The multiplication of two matrices is

   3.    2.
   9.    6.

-->
```

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2) With using Function :

```
// Matrix Multiplication
clc
function [ ] = multiplication(m, n, p, q, A, B)
C=zeros(m,n);
if n==p
disp('Matrices are conformable for multiplication')
else
disp('Matrices are not conformable for multiplication')
break;
end
C=A*B
disp('The first matrix is')
disp (A)
disp('The Second matrix is')
disp (B)
disp('The multiplication of two matrices is')
disp (C)
endfunction
```

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Expt. No. 3. Page No.

PRACTICAL - 3

AIM : W.A.P to find transpose of a matrix with and without using function.

SOFTWARE USED : SciLab

SOURCE CODE :

1) Without using Function :

```
// matrix transpose script file
clc
m=input("Enter number of rows of the Matrix: ");
n=input("Enter number of columns of the Matrix: ");
disp('Enter the Matrix')
for i=1:m
   for j=1:n
   A(i,j)=input('');
    end
end
B=zeros(n,m);
for i=1:n
 for j=1:m
 B(i,j)=A(j,i)
 end
end
disp('Entered matrix is')
disp(A)
disp('Transposed matrix is')
disp(B)
```

Teacher's Signature

THEORY :

let A be a matrix of order $m \times n$

then, A^T is defined as the transpose of A such that rows are interchanged with columns

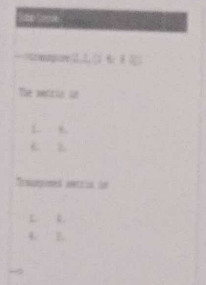
$\therefore$ order of $A^T = n \times m$

eg; $A = \begin{bmatrix} 1 & 4 & 6 \\ 3 & 2 & 8 \end{bmatrix}_{2\times 3} \Rightarrow A^T = \begin{bmatrix} 1 & 3 \\ 4 & 2 \\ 6 & 8 \end{bmatrix}_{3\times 2}$

OUTPUT :

```
Scilab Console

Enter number of rows of the Matrix: 2
Enter number of columns of the Matrix: 2

 Enter the Matrix
\1
\2
\8
\6

 Entered matrix is

    1.    2.    2.
    8.    6.    6.

 Transposed matrix is

    1.    8.
    2.    6.

-->
```

OUTPUT :



2) Using Function :

```
// Matrix Transpose function file
function []=transpose(m, n, A)
B=zeros(m,n);
B=A'
disp('The matrix is')
disp (A)
disp('Transposed matrix is')
disp (B)
endfunction
```