Matrix Representation

Read and Print m x n matric

INPUT "Enter no of rows"; m
- INPUT "Enter no of columns"; n
DIM A(m,n)
Print "Read Matrix of m x n order"
for i = 1 to m
for j = 1 to n
PRINT "ENTER A ("; i; ","; j; ")"'s value";
INPUT A(i,j)
Next j
Next i
Print   → for empty line
Print "Print Matrix of m x n order"
for i = 1 to m
for j = 1 to n
Print A(i,j);   ; → FiRST row ek ot aaye
Next j
Print   → for new row
Next i
End

i = 1 set hogya
j = 1 → Fix Nhi hua

Next j
j = 2

J Ki value 2 tak
Ki hai

	m = 3	n = 2
	1	2
1	(1,1)	(1,2)
2		
3		

(m,n)

outer loop i = 1 to 3
inner loop j = 1 to 2

FIRST   i = 1   fixed
Then j = 1
Then j = 2

using Read ... data

```
Read  m, n
DIM  A (10, 10)
Print " Matrix of m xn order"
for i= 1 to m
for j= 1 to n
Read A (i, j)
Print A (i, j)
Next j
Print
Next i
Data 3, 3                    ⟶    (m=3, n=3)
Data 1, 2, 3
Data 4, 6, 8
Data 10, 9, 7
End
```

Output

```
Matrix of m xn order
     1    2  3
     4    6  8
    10    9  7
```

Add"

```
REM    Matrix add'
Input "Enter the no. of rows "; m
Input "Enter the no. of columns "; n
DIM A (m,n), B(m,n), C (m,n)
Print "The Matrix A is "
for i = 1 TO m
for j = 1 TO n
Print "Enter A ("; i ; "," ; j ; ") 's value"
INPUT A(i,j) : Print A(i,j);
Next j
Print
Next i
for i = 1 TO m
for j = 1 TO n
Print "Enter B ("; i ; "," ; j ; ") 's value"
INPUT B(i,j)
Print B(i,j);
Next j
Print
Next i
Print
Print "The added Matrix C is "
for i = 1 to m
for j = 1 to n
C(i,j) = A(i,j) + B(i,j)
Print C(i,j);
Next j
Print
Next i
END
```

Multiplication of Matrices

phli row phlo column → phli row dusra column → phli row tisra column

$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix} \qquad B = \begin{pmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{pmatrix}$$

$$C = A * B$$

A * B

b columns same · · · b columns same · · · b columns same

$$= \begin{pmatrix} a_{11}b_{11} + a_{12}b_{21} + a_{13}b_{31} & a_{11}b_{12} + a_{12}b_{22} + a_{13}b_{31} & a_{11}b_{13} + a_{12}b_{23} + a_{13}b_{33} \\ a_{21}b_{11} + a_{22}b_{21} + a_{23}b_{31} & a_{21}b_{12} + a_{22}b_{22} + a_{23}b_{32} & a_{21}b_{13} + a_{22}b_{23} + a_{23}b_{33} \\ a_{31}b_{11} + a_{32}b_{21} + a_{33}b_{31} & a_{31}b_{12} + a_{32}b_{22} + a_{33}b_{32} & a_{31}b_{13} + a_{32}b_{23} + a_{33}b_{33} \end{pmatrix}$$

$$C = A * B = \begin{pmatrix} c_{11} & c_{12} & \cdots & c_{1P} \\ c_{21} & c_{22} & \cdots & c_{2P} \\ \cdot & \cdot & & \cdot \\ \cdot & \cdot & & \cdot \\ c_{m1} & c_{m2} & \cdots & c_{mp} \end{pmatrix}$$

→ phle row # a ke just bad Hmesha 1 Hai

dusre row # a ke just bad Hmesha 2 hai

Ⓜ

$C (m \times p)$

$C_{11} = ?$

```
REM MATRIX MULTIPLICATION
DIM A(10,10), B(10,10), C(10,10)
30 INPUT "ENTER NO. OF ROWS AND COLUMNS FOR FIRST
        MATRIX"; M,N
INPUT "ENTER NO. OF ROWS AND COLUMNS FOR
        Second Matrix"; X,Y
IF N <> X THEN PRINT "NOT POSSIBLE" : GOTO 30
PRINT "MATRIX A(I,J) IS"
FOR I = 1 TO M
FOR J = 1 TO N
READ A(I,J)
NEXT J
PRINT
NEXT I
DATA 2,1,3
DATA 4,5,3
DATA 1,2,1
PRINT "MATRIX B IS"
FOR I = 1 TO X
FOR J = 1 TO Y
READ B(I,J)
NEXT J
PRINT
NEXT I
DATA 4,6,2
DATA 1,3,9
DATA 1,2,1

FOR I = 1 TO 3
FOR J = 1 TO 3
C(I,J) = D
FOR K = 1 TO 3
```

```
C(I,J) = A(I,K) * B(K,J) + C(I,J)

FOR I = 1 TO 3
FOR J = 1 TO 3
PRINT C(I,J);
NEXT J
PRINT
NEXT I
END
```

Transpose of a matrix

```
INPUT " ENTER NO. OF ROWS" ; M
INPUT " ENTER NO. OF COLUMNS " ; N
DIM A(M,N)
DIM B(N,M)
PRINT " The Matrix A is "
FOR I = 1 TO M
FOR J = 1 TO N
READ A(I,J)
PRINT A(I,J);
NEXT J
PRINT
NEXT I
DATA 2,4,6,8,10,12
PRINT " THE TRANSPOSE OF MATRIX A IS"
FOR I = 1 TO N
FOR J = 1 TO M
B(I,J) = A(J,I)
PRINT B(I,J);
NEXT J
PRINT
NEXT I
END
```