**Assignment-16**

1. Write a program to calculate the sum of two matrices each of order 3x3.

Ans- #include <stdio.h>

int main()

{

int a[3][3],b[3][3],i,j,c[3][3];

printf("enter the first 3x3 matrix elements:\n");

for(i=0;i<=2;i++)

{

for(j=0;j<=2;j++)

{

scanf("%d",&a[i][j]);

}

}

printf("enter the second 3x3 matrix elements:\n");

for(i=0;i<=2;i++)

{

for(j=0;j<=2;j++)

{

scanf("%d",&b[i][j]);

}

}

for(i=0;i<=2;i++)

{

for(j=0;j<=2;j++)

{

c[i][j]=a[i][j]+b[i][j];

}

}

printf("sum of two matrix is :\n");

for(i=0;i<=2;i++)

{

for(j=0;j<=2;j++)

{

printf("%d ",c[i][j]);

}

printf("\n");

}

return 0;

}

1. Write a program to calculate the product of two matrices each of any order.

Ans- #include <stdio.h>

int main()

{

int row1,col1,row2,col2,a[20][20],b[20][20],c[20][20],k,p,i,j,sum;

printf("Enter the row and col of first matrix");

scanf("%d%d",&row1,&col1);

printf("Enter the row and col of first matrix");

scanf("%d%d",&row2,&col2);

if(col1==row2)

{

printf("enter first matrix elements");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col1-1;j++)

{

scanf("%d",&a[i][j]);

}

}

printf("enter second matrix elements");

for(i=0;i<=row2-1;i++)

{

for(j=0;j<=col2-1;j++)

{

scanf("%d",&b[i][j]);

}

}

p=row1;

k=0;

while(p!=0)

{

for(i=0;i<row1;i++)

{

sum=0;

for(j=0;j<row2;j++)

{

sum=sum+a[k][j]\*b[j][i];

}

c[k][i]=sum;

}

p--;

k++;

}

printf("multiplication is:\n");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col2-1;j++)

{

printf("%d ",c[i][j]);

}

printf("\n");

}

}

else

printf("Multiplication is not possible for two matrix");

return 0;

}

3. Write a program in C to find the transpose of a given matrix.

Ans- #include <stdio.h>

int main()

{

int a[10][10],i,j,x,y;

printf("enter row and column of the matrix: ");

scanf("%d%d",&x,&y);

printf("enter the first 3x3 matrix elements:\n");

for(i=0;i<=x-1;i++)

{

for(j=0;j<=y-1;j++)

{

scanf("%d",&a[i][j]);

}

}

printf("transpose of the matrix is:\n");

for(i=0;i<=y-1;i++)

{

for(j=0;j<=x-1;j++)

{

printf("%d ",a[j][i]);

}

printf("\n");

}

return 0;

}

4. Write a program in C to find the sum of right diagonals of a matrix.

5. Write a program in C to find the sum of left diagonals of a matrix.

6. Write a program in C to find the sum of rows and columns of a Matrix.

7. Write a program in C to print or display the lower triangular of a given matrix.

Ans- #include <stdio.h>

int main()

{

int row1,col1,a[20][20],i,j;

printf("Enter the row and col of first matrix");

scanf("%d%d",&row1,&col1);

if(col1==row1)

{

printf("enter matrix elements");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col1-1;j++)

{

scanf("%d",&a[i][j]);

}

}

printf("the lower triangular is\n");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col1-1;j++)

{

if(j<=i)

printf(" %d",a[i][j]);

else

printf(" ");

}

printf("\n");

}

}

else

printf("Multiplication is not possible for two matrix");

return 0;

}

8. Write a program in C to print or display an upper triangular matrix.

Ans- #include <stdio.h>

int main()

{

int row1,col1,a[20][20],i,j;

printf("Enter the row and col of first matrix");

scanf("%d%d",&row1,&col1);

if(col1==row1)

{

printf("enter matrix elements");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col1-1;j++)

{

scanf("%d",&a[i][j]);

}

}

printf("the upper triangular is");

for(i=0;i<=row1-1;i++)

{

for(j=0;j<=col1-1;j++)

{

if(j>=i)

printf(" %d",a[i][j]);

else

printf(" ");

}

printf("\n");

}

}

else

printf("Multiplication is not possible for two matrix");

return 0;

}

9. Write a program in C to accept a matrix and determine whether it is a sparse matrix.

Ans- #include <stdio.h>

int main()

{

int row,col,a[20][20],i,j,count=0;

printf("Enter the row and col of first matrix");

scanf("%d%d",&row,&col);

printf("enter matrix elements");

for(i=0;i<=row-1;i++)

{

for(j=0;j<=col-1;j++)

{

scanf("%d",&a[i][j]);

}

}

for(i=0;i<=row-1;i++)

{

for(j=0;j<=col-1;j++)

{

if(a[i][j]==0)

count++;

}

}

if(count>(row\*col/2))

printf("the matrix is sparse matrix");

else

printf("the matrix is not a sparse matrix");

return 0;

}

10. Write a program in C to find the row with maximum number of 1s.