/\*matrix add,subtract,mul,transpose\*/

#include<stdio.h>

void add(int a1[][5],int b1[][5],int sum[][5],int row1,int row2,int col1,int col2);

void sub(int a1[][5],int b1[][5],int subtract[][5],int row1,int row2,int col1,int col2);

void multiply(int a1[][5],int b1[][5],int res[][5],int row1,int row2,int col1,int col2);

void transpose(int a1[][5],int trans\_mat[][5],int row1,int col1);

int main()

{

int row1,col1,row2,col2;

int a[5][5],b[5][5],sum[5][5],subtract1[5][5],res[5][5],trans\_mat[5][5];

printf("enter the no of rows in 1st matrix\n");

scanf("%d",&row1);

printf("enter the no of cols in 1st matrix\n");

scanf("%d",&col1);

printf("enter the no of rows in 2nd matrix\n");

scanf("%d",&row2);

printf("enter the no of cols in 2nd matrix\n");

scanf("%d",&col2);

add(a,b,sum,row1,row2,col1,col2);

sub(a,b,subtract1,row1,row2,col1,col2);

multiply(a,b,res,row1,row2,col1,col2);

transpose(a,trans\_mat,row1,col1);

return 0;

}

void add(int a1[][5],int b1[][5],int sum[][5],int row1,int row2,int col1,int col2)

{

int i,j,row\_sum,col\_sum;

while(row1==row2 && col1==col2)

{

row\_sum=row1;

col\_sum=col1;

printf("enter the elements of 1st matrix\n");

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

{

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

{

scanf("%d",&a1[i][j]);

}

}

printf("enter the elements of 2nd matrix\n");

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

{

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

{

scanf("%d",&b1[i][j]);

}

}

for(i=0;i<row\_sum;i++)

{

for(j=0;j<col\_sum;j++)

{

sum[i][j]=a1[i][j]+b1[i][j];

}

}

printf("the resultant matrix is(for sum)\n");

for(i=0;i<row\_sum;i++)

{

printf("\n");

for(j=0;j<col\_sum;j++)

printf("%d\t",sum[i][j]);

}

}

if(row1!=row2||col1!=col2)

{

printf("addition not possible\n");

}

}

void sub(int a1[][5],int b1[][5],int subtract1[][5],int row1,int row2,int col1,int col2)

{

int i,j,row\_sub,col\_sub;

while(row1==row2 && col1==col2)

{

row\_sub=row1;

col\_sub=col1;

printf("enter the elements of 1st matrix\n");

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

{

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

{

scanf("%d",&a1[i][j]);

}

}

printf("enter the elements of 2nd matrix\n");

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

{

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

{

scanf("%d",&b1[i][j]);

}

}

for(i=0;i<row\_sub;i++)

{

for(j=0;j<col\_sub;j++)

{

subtract1[i][j]=a1[i][j]-b1[i][j];

}

}

printf("the resultant matrix is(for sub)\n");

for(i=0;i<row\_sub;i++)

{

printf("\n");

for(j=0;j<col\_sub;j++)

printf("%d\t",subtract1[i][j]);

}

}

if(row1!=row2||col1!=col2)

{

printf("subtraction not possible\n");

}

}

void multiply(int a1[][5],int b1[][5],int res[][5],int row1,int row2,int col1,int col2)

{

int i,j,k,res\_row,res\_col;

while(col1==row2)

{

res\_row=row1;

res\_col=col2;

printf("enter the elements of 1st matrix\n");

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

{

for(k=0;k<col1;k++)

{

scanf("%d",&a1[i][k]);

}

}

printf("enter the elements of 2nd matrix\n");

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

{

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

{

scanf("%d",&b1[k][j]);

}

}

for(i=0;i<res\_row;i++)

{

for(j=0;j<res\_col;j++)

{

res[i][j]=0;

for(k=0;k<res\_col;k++)

res[i][j]=res[i][j]+(a1[i][k]\*b1[k][i]);

}

}

printf("the resultant matrix is(for mul)\n");

for(i=0;i<res\_row;i++)

{

printf("\n");

for(j=0;j<res\_col;j++)

printf("%d\t",res[i][j]);

}

}

if(row1!=row2||col1!=col2)

{

printf("multiplication not possible\n");

}

}

void transpose(int a1[][5],int trans\_mat[][5],int row1,int col1)

{

int i,j;

printf("enter the elements of 1st matrix\n");

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

{

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

{

scanf("%d",&a1[i][j]);

}

}

printf("the elements of the matrix are\n");

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

{

printf("\n");

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

printf("%d\t",a1[i][j]);

}

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

{

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

{

trans\_mat[j][i]=a1[i][j];

}

}

printf("the resultant matrix is(for transpose)\n");

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

{

printf("\n");

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

printf("%d\t",trans\_mat[i][j]);

}

}

