// A9: matrix programming

Write C/C++ program for storing matrix. Write functions for

a) Check whether given matrix is upper triangular or not

b) Compute summation of diagonal elements

c) Compute transpose of matrix

d) Add, subtract and multiply two matrices

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\* matrix.cpp

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// A9: matrix programming

**#include**<iostream>

**using** **namespace** std;

**int** main()

{

**int** m1,n1,m2,n2,a[10][10],b[10][10],trans[10][10],c[10][10],sum=0;

**char** ans;

cout<<"enter size of first matrix";

cin>>m1>>n1;

cout<<"enter first matrix"<<endl;

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cin>>a[i][j];

}

}

cout<<"first matrix"<<endl;

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cout<<"\t"<<a[i][j];

}

cout<<endl;

}

cout<<endl<<"enter size of second matrix";

cin>>m2>>n2;

cout<<"enter second matrix"<<endl;

**for**(**int** i=0;i<m2;i++)

{

**for**(**int** j=0;j<n2;j++)

{

cin>>b[i][j];

}

}

cout<<"second matrix"<<endl;

**for**(**int** i=0;i<m2;i++)

{

**for**(**int** j=0;j<n2;j++)

{

cout<<"\t"<<b[i][j];

}

cout<<endl;

}

**do**

{

cout<<endl<<"1. Upper triangular of matrix"<<endl<<"2. summation of diagonal elements"<<endl<<"3. transpose of matrix"<<endl<<"4.addition of 2 matrix"<<endl<<"5. subtraction of 2 matrix"<<endl<<"6. multiplication of 2 matrix"<<endl<<"enter your choice";

**int** ch;

cin>>ch;

**switch**(ch)

{

**case** 1:

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

**if**(i<=j)

{

cout<<"\t"<<a[i][j];

}

**else**

{

cout<<"\t";

}

}

cout<<endl;

}

**break**;

**case** 2:

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

**if**(i==j)

{

sum=sum+a[i][j];

}

}

}

cout<<sum;

**break**;

**case** 3:

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

trans[j][i]=a[i][j];

}

}

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cout<<"\t"<<trans[i][j];

}

cout<<endl;

}

**break**;

**case** 4:

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

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

}

}

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cout<<"\t"<<c[i][j];

}

cout<<endl;

}

**break**;

**case** 5:

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

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

}

}

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cout<<"\t"<<c[i][j];

}

cout<<endl;

}

**break**;

**case** 6:

cout<<"for matrix mutiplication raw of 1st matrix must be similar to column of second matrix "<<endl;

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

c[i][j]=0;

**for**(**int** k=0;k<n1;k++)

{

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

}

}

}

**for**(**int** i=0;i<m1;i++)

{

**for**(**int** j=0;j<n1;j++)

{

cout<<"\t"<<c[i][j];

}

cout<<endl;

}

**break**;

}

cout<<endl<<"do you want to continue?(y/n)";

cin>>ans;

}**while**(ans=='y' || ans=='Y');

**return** 0;

}

//output

enter size of first matrix3

3

enter first matrix

1

2

3

4

5

6

7

8

9

first matrix

1 2 3

4 5 6

7 8 9

enter size of second matrix3

3

enter second matrix

2

2

2

2

2

2

2

2

2

second matrix

2 2 2

2 2 2

2 2 2

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice1

1 2 3

5 6

9

do you want to continue?(y/n)y

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice2

15

do you want to continue?(y/n)y

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice3

1 4 7

2 5 8

3 6 9

do you want to continue?(y/n)y

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice4

3 4 5

6 7 8

9 10 11

do you want to continue?(y/n)y

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice5

-1 0 1

2 3 4

5 6 7

do you want to continue?(y/n)y

1. Upper triangular of matrix

2. summation of diagonal elements

3. transpose of matrix

4.addition of 2 matrix

5. subtraction of 2 matrix

6. multiplication of 2 matrix

enter your choice6

for matrix mutiplication raw of 1st matrix must be similar to column of second matrix

12 12 12

30 30 30

48 48 48

do you want to continue?(y/n)n