CS-114 - Fundamental of Programing

Lab # 9

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**Task 1:**

#include <iostream>

#include <iomanip>

using namespace std;

int main(){

double a[3][3], adj[3][3], det, a\_inv[3][3], temp=0;

cout<<"Input 9 integers in the 3x3 matrix: \n";

for(int i=0; i<3; i++){

for(int j=0; j<3; j++){

cin>>a[i][j];

}

}

cout<<"The values in the matrix are: \n";

for(int i=0; i<3; i++){

cout<<"| ";

for(int j=0; j<3; j++){

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

}

cout<<"|"<<endl;

}

det=+a[0][0]\*(a[1][1]\*a[2][2]-a[2][1]\*a[1][2])

-a[0][1]\*(a[1][0]\*a[2][2]-a[1][2]\*a[2][0])

+a[0][2]\*(a[1][0]\*a[2][1]-a[1][1]\*a[2][0]);

cout<<"The determinant of the matrix is: "<<det<<endl;

adj[0][0]=+(a[1][1]\*a[2][2]-a[2][1]\*a[1][2]);

adj[0][1]=-(a[1][0]\*a[2][2]-a[1][2]\*a[2][0]);

adj[0][2]=+(a[1][0]\*a[2][1]-a[1][1]\*a[2][0]);

adj[1][0]=-(a[0][1]\*a[2][2]-a[0][2]\*a[2][1]);

adj[1][1]=+(a[0][0]\*a[2][2]-a[0][2]\*a[2][0]);

adj[1][2]=-(a[0][0]\*a[2][1]-a[0][1]\*a[2][0]);

adj[2][0]=+(a[0][1]\*a[1][2]-a[0][2]\*a[1][1]);

adj[2][1]=-(a[0][0]\*a[1][2]-a[0][2]\*a[1][0]);

adj[2][2]=+(a[0][0]\*a[1][1]-a[0][1]\*a[1][0]);

cout<<"The cofactor of the matrix is: \n";

for(int i=0; i<3; i++){

cout<<"| ";

for(int j=0; j<3; j++){

cout<<adj[i][j]<<" ";

}

cout<<"|"<<endl;

}

for(int i=0; i<3; i++){

for(int j=i+1; j<3; j++){

temp=adj[i][j];

adj[i][j]=adj[j][i];

adj[j][i]=temp;

}

}

cout<<"The adjoint of the matrix is: \n";

for(int i=0; i<3; i++){

cout<<"| ";

for(int j=0; j<3; j++){

cout<<adj[i][j]<<" ";

}

cout<<"|"<<endl;

}

for(int i=0; i<3; i++){

for(int j=0; j<3; j++){

a\_inv[i][j]=adj[i][j]/det;

}

}

cout<<"The inverse of the matrix is: \n";

for(int i=0; i<3; i++){

cout<<"| ";

for(int j=0; j<3; j++){

cout<<setprecision (3)<<a\_inv[i][j]<<" ";

}

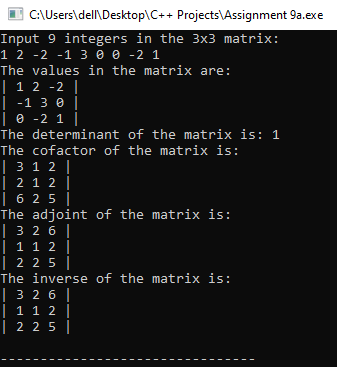
cout<<"|"<<endl;

}

return 0;

}

**Task 1 Output:**

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