FUNDAMENTALS OF PROGRAMMING
LAB MANUAL 9

HOME TASK

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```cpp
#include <iostream>

using namespace std;

float determinant(float a[][3]);

int main() {

    float A[3][3];

    int n;


    cout << "Please enter numbers for a 3 by 3 matrix." << endl;


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

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

            cout << "Enter element A" << i + 1 << j + 1 << ": ";

            cin >> A[i][j];

        }

    }


    cout << "\nThe original 3 by 3 matrix is the following:" << endl;


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

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

            cout << "  " << A[k][m] << "  ";

        }

        cout << endl;
```

```cpp
}


float determinant_1 = determinant(A);


float A11 = 1 * (A[1][1] * A[2][2] - A[1][2] * A[2][1]);

float A12 = -1 * (A[1][0] * A[2][2] - A[1][2] * A[2][0]);

float A13 = 1 * (A[1][0] * A[2][1] - A[1][1] * A[2][0]);

float A21 = -1 * (A[0][1] * A[2][2] - A[0][2] * A[2][1]);

float A22 = 1 * (A[0][0] * A[2][2] - A[0][2] * A[2][0]);

float A23 = -1 * (A[0][0] * A[2][1] - A[0][1] * A[2][0]);

float A31 = 1 * (A[0][1] * A[1][2] - A[0][2] * A[1][1]);

float A32 = -1 * (A[0][0] * A[1][2] - A[0][2] * A[1][0]);

float A33 = 1 * (A[0][0] * A[1][1] - A[0][1] * A[1][0]);


A[0][0] = A11;

A[0][1] = A12;

A[0][2] = A13;

A[1][0] = A21;

A[1][1] = A22;

A[1][2] = A23;

A[2][0] = A31;

A[2][1] = A32;

A[2][2] = A33;


cout << "\nThe inverse of the 3 by 3 matrix is the following:" << endl;


for (n = 0; n < 3; n++) {
   for (int p = 0; p < 3; p++) {
      cout << "  " << A[p][n] / determinant_1 << "  ";
```

```cpp
    }

    cout << endl;

  }


  return 0;

}


float determinant(float a[][3]) {

  float determinant_2 = (a[0][0] * (a[1][1] * a[2][2] - a[1][2] * a[2][1])) -

    (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]));

  return determinant_2;

}
```

```
Please enter numbers for a 3 by 3 matrix.
Enter element A11: 1
Enter element A12: 2
Enter element A13: 3
Enter element A21: 4
Enter element A22: 5
Enter element A23: 6
Enter element A31: 7
Enter element A32: 8
Enter element A33: 9

The original 3 by 3 matrix is the following:
  1.00     2.00     3.00
  4.00     5.00     6.00
  7.00     8.00     9.00

The inverse of the 3 by 3 matrix is the following:
  0.03     -0.06     0.03
  -0.06     0.13    -0.06
  0.03     -0.06     0.03
```