

MATHEMATICS FOR EMBEDDED SYSTEMS  
LAB 03  
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## PROGRAM

```
//=====
// Name       : math_lab_03.cpp
// Author      :
// Version     :
// Copyright   : Your copyright notice
// Description : Hello World in C++, Ansi-style
//=====

#include <iostream>
using namespace std;

int main() {
    // size of the square matrix
    int t_n = 3;
    //coefficients of variables
    float matr[t_n][t_n]={{2,1,4},{1,2,3},{4,-1,2}};
    //constants
    float con_mat[t_n] = {1,1.5,2};

    float temp_arr[t_n];
    float cn,cm,con;
    for(int x=0;x<t_n;x++){
        for(int y=0;y<x;y++){
            cn = matr[x][y];
            cm = matr[y][y];
            con_mat[x] = con_mat[x]*cm;
            con = con_mat[y]*cn;
            con_mat[x] = con-con_mat[x];

            for(int yn=0;yn<t_n;yn++){
                matr[x][yn]= matr[x][yn]*cm;
                temp_arr[yn] = matr[y][yn]*cn;
            }
            for(int yn=0;yn<t_n;yn++){
                matr[x][yn] = temp_arr[yn]-matr[x][yn];
            }
        }
        for(int x=0;x<t_n;x++){
            for(int y =0;y<t_n;y++){
                cout<<matr[x][y]<<" ";
            }
            cout<<"\n";
        }
        cout<<"constants";
        for(int x =0;x<t_n;x++){cout<<" "<<con_mat[x];}
        cout<<"\n----\n";
    }
}

float coff[t_n],cff=1;
for(int x = 0;x<t_n;x++){
    coff[x]=1;
}
for(int x = t_n-1;x>=0;x--){

    for(int i = x+1;i<t_n;i++){
        matr[x][i] = matr[x][i]*coff[i];
    }
    for(int y = x+1;y<t_n;y++){
        con_mat[x] = con_mat[x]-matr[x][y];
    }
}
```

```

    }
    con_mat[x] = con_mat[x]/matr[x][x];
    coff[x] = con_mat[x];
}
for(int x = 0;x<t_n;x++){cout<<"\nx"<<x<<" : "<<con_mat[x];}
    return 0;
}

```

## RESULT

The screenshot shows the Eclipse IDE with the file `math_lab_03.cpp` open. The code defines a function `14=()` that takes a matrix `matr` and its size `t_n`, and returns a vector of constants. The program uses nested loops to calculate the row-wise constants of the inverse matrix.

**Console Output:**

```

<terminated> (exit value: 0) math_lab_03 [C/C++ Application] /home/shinu/asd/ecd
2 1 4
0 -3 -2
4 -1 2
constants 1 -2 2
-----
2 1 4
0 -3 -2
0 6 12
constants 1 -2 0
-----
2 1 4
0 -3 -2
0 0 24
constants 1 -2 -12
-----
x0 : 1
x1 : 1
x2 : -0.5

```

**Registers:**

Name	Value	Description
x0	1	
x1	1	
x2	-0.5	