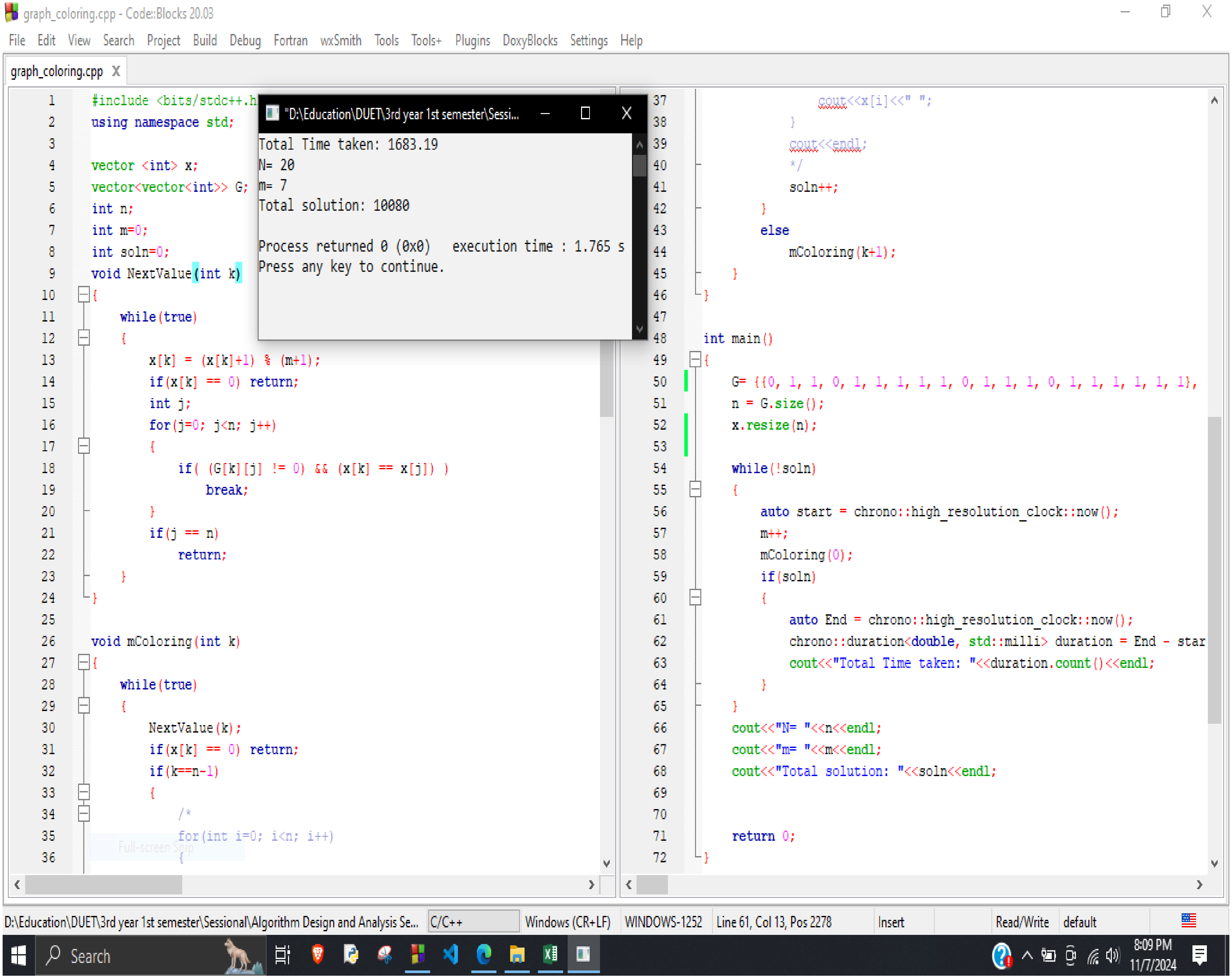
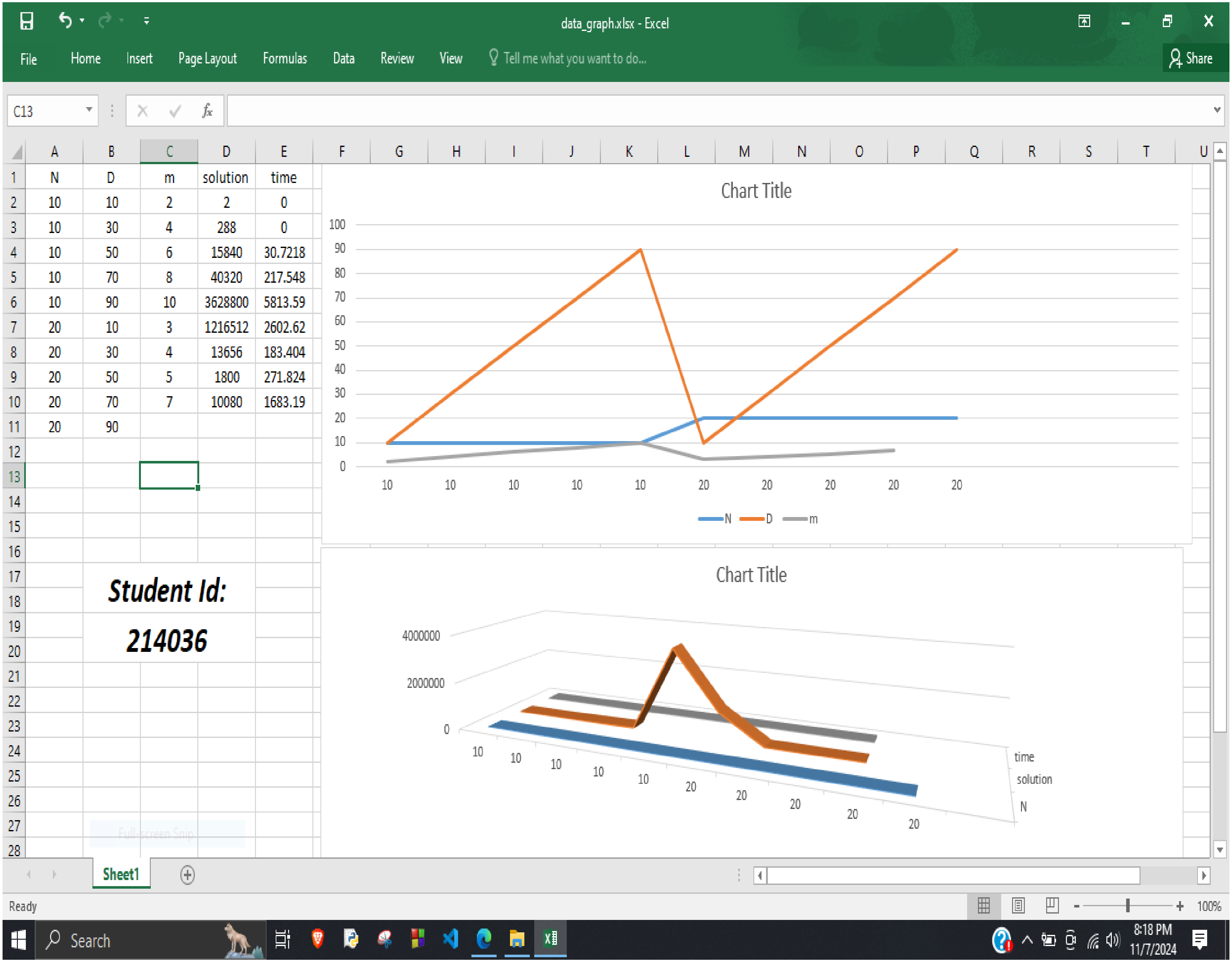

graph_coloring.cpp - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
graph_coloring.cpp
"D:\Education\DUET\3rd year 1st semester\Sessi...
Full-screen Snip
D:\Education\DUET\3rd year 1st semester\Sessional\Algorithm Design and Analysis Se...
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 61, Col 13, Pos 2278
Insert
Read/Write
default
Search
8:09 PM
11/7/2024

```
#include <bits/stdc++.h
using namespace std;

vector <int> x;
vector<vector<int>> G;
int n;
int m=0;
int soln=0;
void NextValue(int k)
{
    while(true)
    {
        x[k] = (x[k]+1) % (m+1);
        if(x[k] == 0) return;
        int j;
        for(j=0; j<n; j++)
        {
            if( (G[k][j] != 0) && (x[k] == x[j]) )
                break;
        }
        if(j == n)
            return;
    }
}

void mColoring(int k)
{
    while(true)
    {
        NextValue(k);
        if(x[k] == 0) return;
        if(k==n-1)
        {
            /*
            for(int i=0; i<n; i++)
            {
                cout<<x[i]<<" ";
            }
            cout<<endl;
            */
            soln++;
        }
        else
            mColoring(k+1);
    }
}

int main()
{
    G= {{0, 1, 1, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1},
    n = G.size();
    x.resize(n);

    while(!soln)
    {
        auto start = chrono::high_resolution_clock::now();
        m++;
        mColoring(0);
        if(soln)
        {
            auto End = chrono::high_resolution_clock::now();
            chrono::duration<double, std::milli> duration = End - star
            cout<<"Total Time taken: "<<duration.count()<<endl;
        }
    }
    cout<<"N= "<<n<<endl;
    cout<<"m= "<<m<<endl;
    cout<<"Total solution: "<<soln<<endl;


    return 0;
}
```

```
Total Time taken: 1683.19
N= 20
m= 7
Total solution: 10080

Process returned 0 (0x0)   execution time : 1.765 s
Press any key to continue.
```



N	D	m	solution	time
10	10	2	2	0
10	30	4	288	0
10	50	6	15840	30.7218
10	70	8	40320	217.548
10	90	10	3628800	5813.59
20	10	3	1216512	2602.62
20	30	4	13656	183.404
20	50	5	1800	271.824
20	70	7	10080	1683.19
20	90			

Student Id:

214036