

Practice 5

Random hill climbing

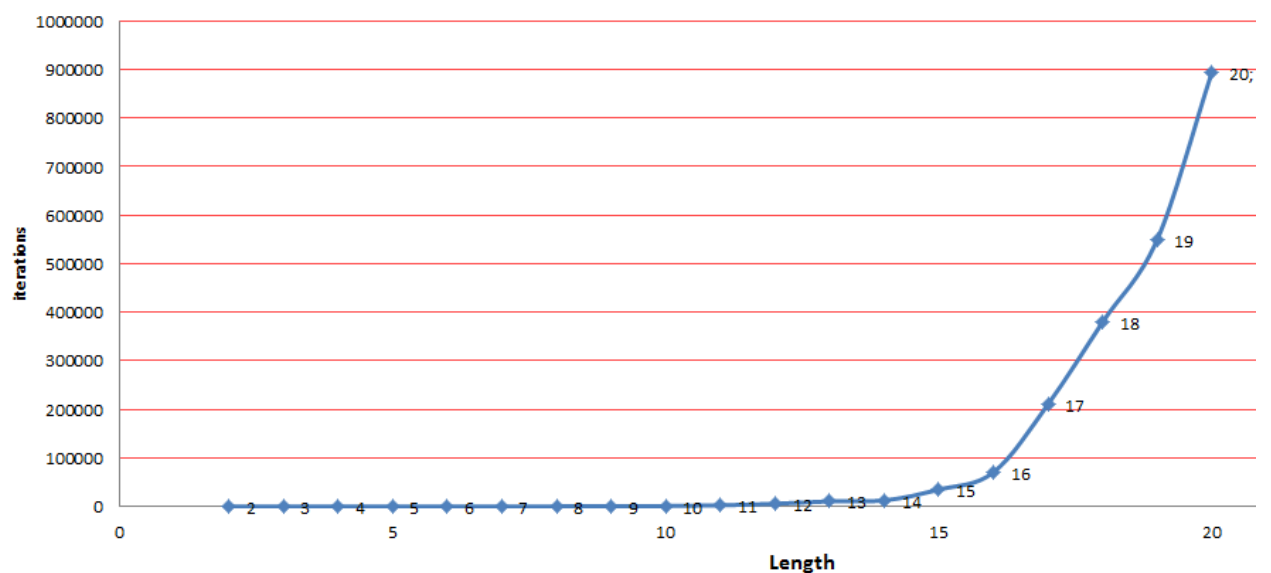
We need to show how much iterations in average of 10 runs we need to find code of 2 to 20 binary genes.

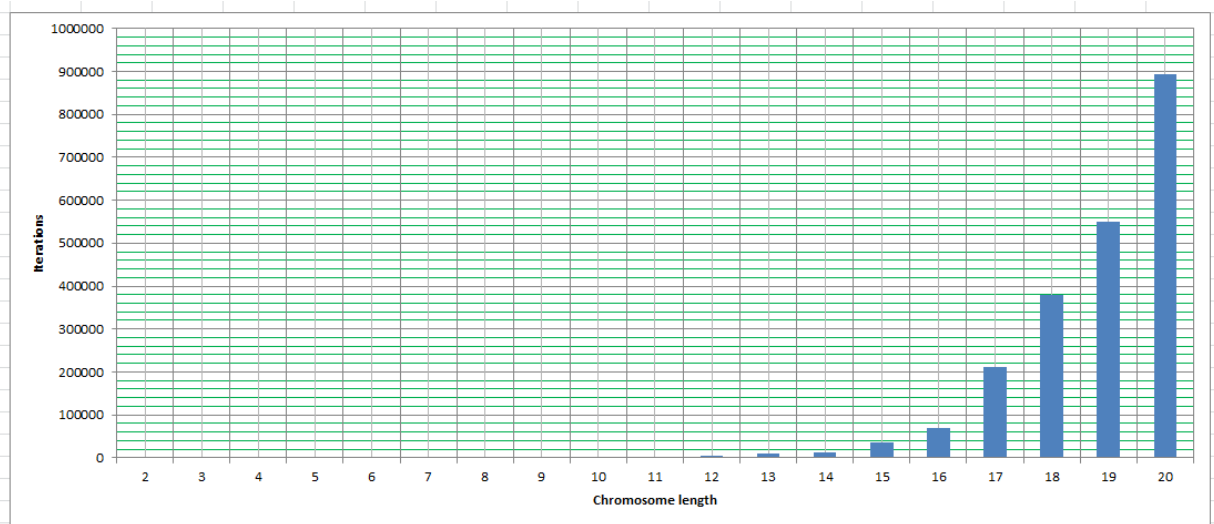
We always need to generate our chromosome at random.

RESULTS:

4	2
6,7	3
14,7	4
39,2	5
51,4	6
125	7
198,5	8
459	9
1072,9	10
2364	11
5546,7	12
10581,3	13
12448,1	14
34706,3	15
70368,3	16
210649,9	17
380000	18
550000	19
894441,2	20

GRAPH





CODE

```
#include <iostream>
#include <fstream>
#include <vector>
#include <time.h>

using namespace std;

int main()
{
    srand(time(NULL));
    ofstream file("OutData.txt", ios::out);

    for (int length = 2; length < 21; length++)
    {
        vector<int> result;
        for (int i = 0; i < dlna; i++)
        {
            int b = rand() % 20;
            if (b < 15)
            {
                result.push_back(0);
            }
            else
                result.push_back(1);
        }

        int k = 0;
        int step = 0;
        while (k < 10)
        {
            step++;
            vector<int> tmp;
            for (int i = 0; i < length; i++)
            {
                int b = rand() % 30;
                if (b < 15)
                {
                    tmp.push_back(0);
                }
                else
                    tmp.push_back(1);
            }
        }
    }
}
```

```

        if (result == tmp)
        {
            file << step << endl;
            step = 0;
            k++;
            result.clear();
            for (int i = 0; i < length; i++)
            {
                int b = rand() % 30;

                result.push_back(0);
            }
            else
                result.push_back(1);
        }
    }
    file << "/////////////////////////////////////" << endl;
}

file.close();
system("pause");
return 0;
}

```