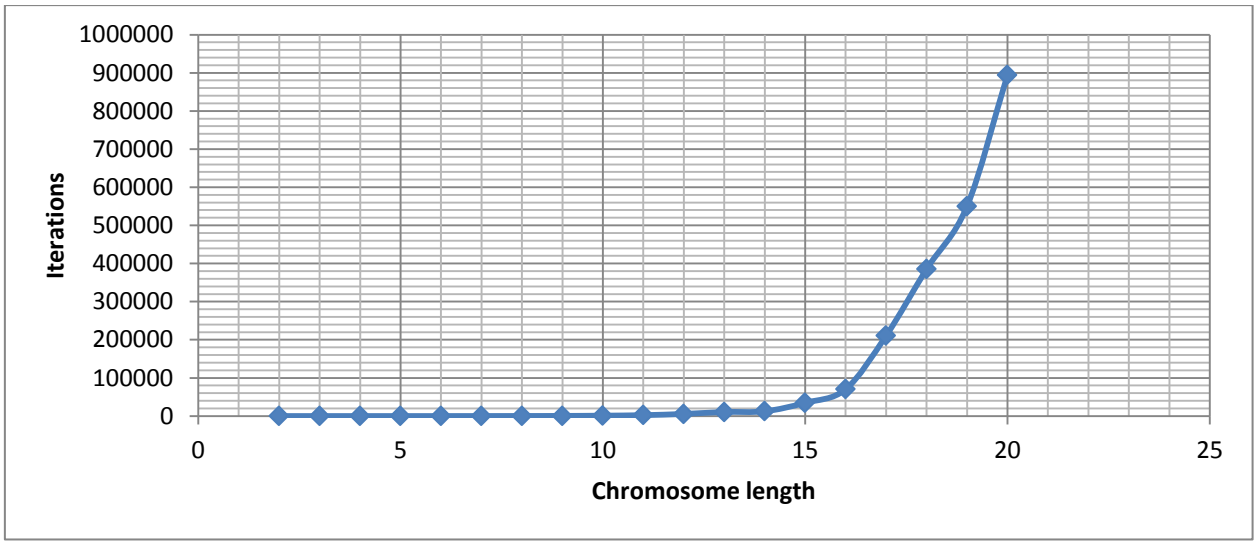
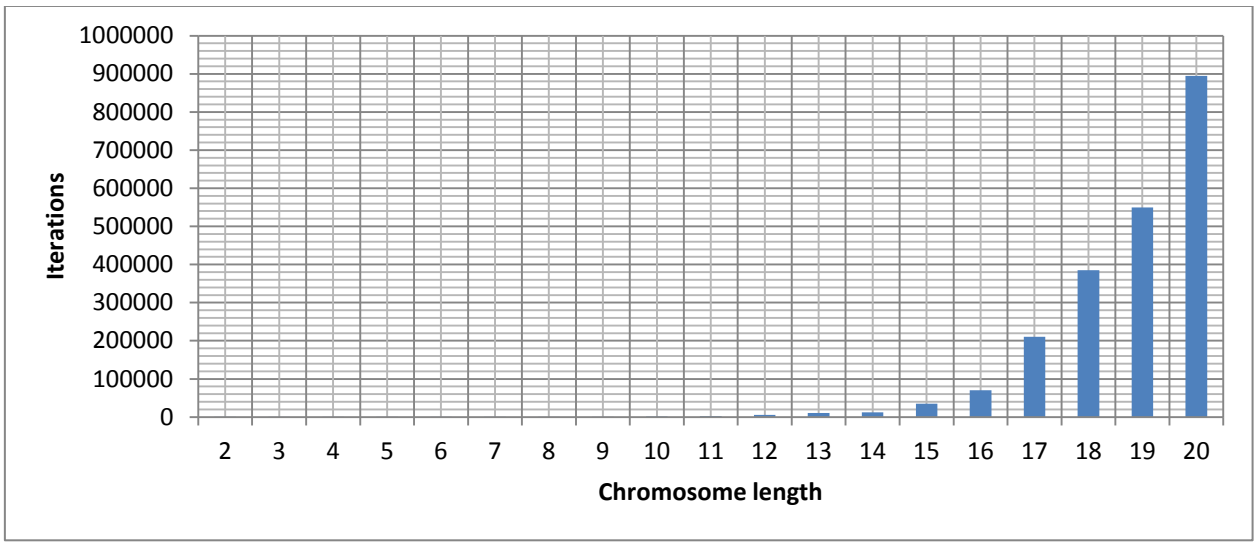
Practice 5
Random hill climbing

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.

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 < length; i++)
		{
			int b = rand() % 30;
			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;
					if (b < 15)
					{
```

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

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

Results: