**Analysis:**

1. What is the worst case complexity of your algorithm?

Ans:

Complexity = O(2.445n)

1. Modify your original algorithm so that it terminates earlier whenever a node is reached that cannot be colored.

Ans:

The program is written in the same folder with the name “Problem\_2.java”.

1. Draw the graph of problem size vs. run time you would expect the two algorithms (with and without early termination) to produce.

Ans:

Following is the table which shows problem size and run time match:

|  |  |  |
| --- | --- | --- |
| **Problem Size** | **Without Termination** | **With Termination** |
| 5 | 46 | 43 |
| 100 | 54 | 52 |
| 250 | 65 | 62 |
| 1000 | 219 | 92 |
| 1750 | 241 | 173 |
| 3000 | 724 | 372 |
| 6000 | 1517 | 1364 |

The graph for corresponding values looks like: