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Activity 1. Map Coloring

In the method I implemented I start by sorting the nodes by their degree (number of neighbors). This follows a complexity of O(n*log(n)).

Then, in each node we search for the colors of its neighbors in order to find out which colors we must not use. We then assign the next available color. This follows a time complexity of (n^2).

So, with this information we have, we can see that the worse case scenario of the problem follows a complexity of O(n^2).

Here is an example of some time measurements I made:

Repetitions = 1000

n	t coloring(ms)
8	12
16	25
32	46
64	199
128	179
256	400
512	840
1024	1764
2048	3320
4096	6809
8192	13742
16384	29099
32768	63682
65536	141283

After analyzing the results, we can see that the growth is too fast for a linear complexity and too slow for a quadratic complexity. So, we can conclude that our problem follows a complexity of approximately O(n*log(n)).