
Homework 5: Q3

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1 $O(n^3)$ Algorithm Idea

For this algorithm, I would create three for loop together. The first for loop it will iterated all nodes in the graph from $\{i_0 \dots i_n\}$. Then, inside that I would have my second for loop. This for loop is mean to iterated all the edge nodes that is connected to the parent node from $\{j_0 \dots j_n\}$. Lastly, I would have my third for loop. It would iterate all the edge that is connected to the j from $\{k_0 \dots k_n\}$. If the edge is not its parent and i, j, k is all connected with each other then there is a cycle and it is a triangle. Each for loop will run at $O(n)$ time, and the final run times for this algorithm is $O(n) * O(n) * O(n)$, which is $O(n^3)$.

2 $O(n * \min(m, \Delta^2))$ Algorithm Idea

Begin Algorithm Idea

3 $O(n * \min(m, \Delta^2))$ Algorithm Details

Algorithm: $O(n * \min(m, \Delta^2))$ Algorithm

4 $O(n * \min(m, \Delta^2))$ Proof Idea

Begin Proof Idea

5 Runtime Analysis of $O(n * \min(m, \Delta^2))$ Algorithm

Begin Runtime analysis

6 $O(m^{\frac{3}{2}})$ Algorithm Idea

Begin Algorithm Idea

7 Runtime Analysis of $O(m^{\frac{3}{2}})$ Algorithm

Begin Runtime Analysis