

Problem Set 5

Problem 1

Reconsider Lemma 3.17 (new lecture notes!). Instead of using the maximum degree D to bound the running time of BFS in the explored subgraph by $D \cdot |V'_i|$, we now want to use $|V(G')|^2$ as a bound on $|E'_i|$. How does the outcome of the computation change, what running time bound do we get?

Problem 2

Assume that we are given a graph with weights $w : V \times V \rightarrow \{1, 2, 3\}$. Can you generalize the formula for the minimum spanning tree value M from the lecture for this case? Can you also generalize it to the case where the weights are integers in $\{1, \dots, W\}$, $W \in \mathbb{N}^{\geq 0}$?