Sep 23, 2024

1. (pts.)

   We are given a directed graph $G = (V, E)$, where $V = \{1, \ldots, n\}$, i.e. the vertices are integers in the range 1 to n. For every vertex i we would like to compute the value $m(i)$ defined as follows: $m(i)$ is the smallest j such that vertex i is reachable from vertex j. (As a convention, we assume that i is reachable from i.) Provide an algorithm to compute all the values $m(1),\ldots,$ $m(n)$ and show that these can be computed in $\Theta(|V| + |E|)$ time.

2. (pts.)

   We are given a directed graph $G = (V, E)$, where $V = \{1, \ldots, n\}$, i.e. the vertices are integers in the range 1 to n. For every vertex i we would like to compute the value $m(i)$ defined as follows: $m(i)$ is the smallest j such that vertex j is reachable from vertex i. (As a convention, we assume that i is reachable from i.) Provide an algorithm to compute all the values $m(1),\ldots,$ $m(n)$ and show that these can be computed in $\Theta(|V| + |E|)$ time.