Exercise 1.4

Problem

Perhaps the first strategy ones tries when designing an algorithm for an optimization problem is the greedy strategy. For the cardinality vertex cover problem, this would involve iteratively picking a maximum degree vertex and removing it, together with edges incident at it, until there are no edges left. Show that this approximation algorithm achieves an approximation guarantee of $O(\log n)$. Give a tight example for this algorithm.

Solution

Insights