16.410-13 Recitation 2 Problems

Problem 1: Complexity of Iterative Deepening Search

Analyze the complexity of iterative deepening search. Compare your result to the complexity of breadth-first search. Which one is better? Explain your conclusions.

Problem 2: Analysis of Depth-first and Breadth-first Search

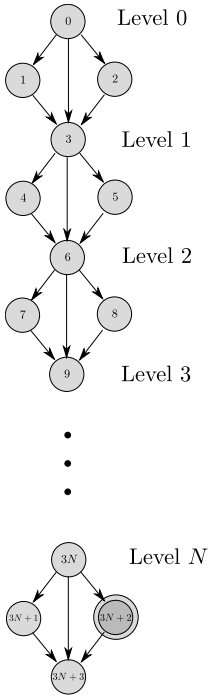

Figure 1: Graph for Problem 1. Goal vertex is marked with a double circle.

Consider the graph given in Figure 1 and derive a precise analytical expression for the following both for depth-first and for breadth-first search. In both cases, carry out your analysis both when the algorithm is maintaining a *visited list* and when it is not. You should only provide upper and lower bounds for breath-first search without a visited vertices list.

i. the number of paths that are examined *(time complexity)*,

ii. the largest number of paths that will be under consideration at any given time, (i.e., queue size) *(space complexity)*,

iii. the length of the path returned *(quality of the solution)*.

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