

Cmpe 300 – Analysis of Algorithms

Fall 2013

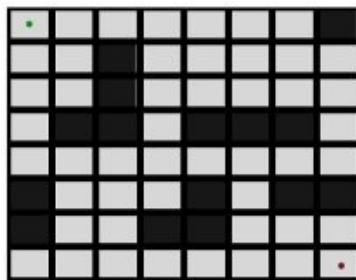
Assignment 2

Due Date: January 14, 2014 (final day)

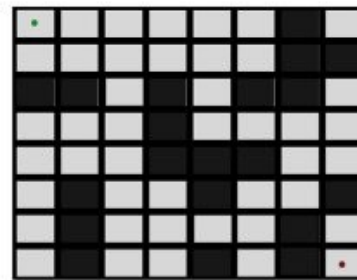
Question 1

Assume a grid world, which is given as a $N \times N$ matrix of integers. Each cell can be either occupied (1) or empty (0).

Problem: Is there a continuous way starting from cell $[1,1]$ to $[N,N]$, by moving only left, right, up and down. (No diagonal movements). For example:



Case 1



Case 2

In case 1, an algorithm solving this problem should return true, in case 2 it is false.

- Determine the lower bound for the worst case complexity of this problem.
- Write an order-optimal algorithm solving this problem, and show that it is order-optimal.
- Convert your algorithm to a probabilistic algorithm, and state if its best and worst case complexities change.

Submission

Bring hard copies of your answers to the final exam.