

Homework 5

CMSC 451, Summer 2009

A.2

You are walking and come to a wall that you want to get beyond. The wall extends infinitely to your left and right. You cannot climb over it or under it. There is one door in the wall, n steps away from where you are standing. You *do not* know the value of n or whether the door is to your left or to your right. The optimal algorithm takes n steps to walk to the door. Give an approximation algorithm you can use to walk to the door in $O(n)$ steps.

- a) Describe the algorithm in words.
- b) Give a pseudocode description of the algorithm.
- c) Give the approximation bound your algorithm achieves.
- d) Prove that your algorithm achieves the bound stated in part c.