

# **CS 440: Introduction to Artificial Intelligence**

Homework #1

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## Problem 0

### Setting Up Our Environments

## Problem 1

### Understanding the Methods

#### Part A

Explain in your report why the first move of the agent for the example search problem is to the east rather than to the north given that the agent does not know initially which cells are blocked.

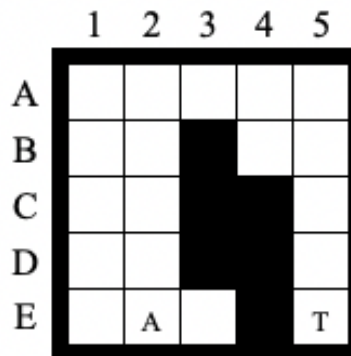


Figure 1: Second Example Search Problem

**Solution.**

#### Part B

This project argues that the agent is guaranteed to reach the target if it is not separated from it by blocked cells. Give a convincing argument that the agent in finite gridworlds indeed either reaches the target or discovers that this is impossible in finite time. Prove that the number of moves of the agent until it reaches the target or discovers that this is impossible is bounded from above by the number of unblocked cells square

**Solution.**

## Problem 2

### The Effects of Ties

## Problem 3

Forward vs. Backward

## Problem 4

Heuristics in the Adaptive  $A^*$

## Problem 5

Heuristics in the Adaptive  $A^*$

## Problem 6

### Statistical Significance