Artificial Intelligence

Lab Report Path Finding

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Homework 3: Search and Pathfinding

**Introduction:**

This lab is to implement Depth-First Search, Iterative Deeping Search, and A \* Search algorithms. They will be tested with three different files varying in size (5x5,10x10, and 20x20).

To use the program we hard coded the tests files all that needs to be done is change 1 in “test\_1.txt” to 2 or 3 depending on the test file name.

**Methods:**

1. Read the file into a 2-D array in which
2. Write a node class and helper methods
3. Write a method to generate successor nodes
4. Write BFS; follow the pseudocode as closely as possible.
5. Write IDS search
6. Write A\* search
7. Method to compute Manhattan distance heuristic

**Results:**

In this lab we were only able to implement two search algorithms DFS and IDS

**Test\_1.txt (5x5)**

DFS:

Cost16

Expansion: 6

Memory: 13

Timer: 78

IDS:

Cost: 26

Expansion: 17

Memory: 7

Timer: 1

Program has ended.

**Test\_2.txt (10x10)**

DFS:

Cost16

Expansion: 6

Memory: 13

Timer: 96

IDS:

Cost: 47

Expansion: 20

Memory: 17

Timer: 2

Program has ended.

**Test\_3.txt (20x20)**

DFS:

Cost16

Expansion: 6

Memory: 13

Timer: 83

IDS:

Cost: 47

Expansion: 21

Memory: 17

Timer: 4

Program has ended.

**Conclusion:**

In this lab we learned the importance of how algorithms work in an artificial setup for the Manhattan distance problem. One thing we are still not really sure is why when we re-run the lab I’m getting different outputs. We followed the pseudo code to the best of our ability.

**Running the jar:**

**javac homework.java**

 java –jar myProgram.jar test\_1.txt

 java –jar myProgram.jar test\_2.txt

 java –jar myProgram.jar test\_3.txt