**Artificial Intelligence**

**Project 1**

**Team 3**

8-Puzzle (Default Board State):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Algorithm (+Heuristic)** | **Nodes Expanded** | **Nodes Generated** | **Solution Cost** | **Time Taken (sec)** |
| **DFS** | - | - | - | - |
| **BFS** | 1271285 | 3589819 | 14 | 11.88 |
| **IDA** | 1965733 | 1965720 | 14 | 3.31 |
| **Djikstra** | 1163507 | 3131259 | 14 | 21.15 |
| **Greedy (Manhattan)** | - | - | - | - |
| **Greedy (Hamming)** | - | - | - | - |
| **A\* (Manhattan)** | 906 | 2439 | 14 | 0.02 |
| **A\* (Hamming)** | 5640 | 16626 | 14 | 0.10 |

DFS: Not Possible (Infinite Search Tree)

Greedy (Manhattan): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3 -> (Heursitic bad and inf search tree)

Greedy (Hamming): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3

8-Puzzle (New Board State below):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Algorithm (+Heuristic)** | **Nodes Expanded** | **Nodes Generated** | **Solution Cost** | **Time Taken (sec)** |
| **DFS** | - | - | - | - |
| **BFS** | 288645 | 819651 | 12 | 1.6388 |
| **IDA** | 446963 | 446952 | 12 | 0.7711 |
| **Djikstra** | 275108 | 737463 | 12 | 2.9916 |
| **Greedy (Manhattan)** | - | - | - | - |
| **Greedy (Hamming)** | - | - | - | - |
| **A\* (Manhattan)** | 68 | 183 | 12 | 0.0020 |
| **A\* (Hamming)** | 2101 | 5969 | 12 | 0.0329 |

DFS: Not Possible (Infinite Search Tree)

Greedy (Manhattan): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3

Greedy (Hamming): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3

New Board State:

[1,6,5,

4,0,2,

7,3,8]

Pacman (Default Board)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Algorithm (+Heuristic)** | **Nodes Expanded** | **Nodes Generated** | **Solution Cost** | **Time Taken (sec)** |
| **DFS** | - | - | - | - |
| **BFS** | 16707 | 36555 | 14 | 0.1139 |
| **IDA** | 30677 | 30665 | 14 | 0.0567 |
| **Djikstra** | 16723 | 36711 | 14 | 0.1944 |
| **Greedy (Euclidean)** | - | - | - | - |
| **A\* (Euclidean)** | 221 | 479 | 14 | 0.0020 |

DFS: Not Possible (Infinite Search Tree)

Greedy (Euclidean): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3

Pacman (Custom Board Below)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Algorithm (+Heuristic)** | **Nodes Expanded** | **Nodes Generated** | **Solution Cost** | **Time Taken (sec)** |
| **DFS** | - | - | - | - |
| **BFS** | 145830 | 361141 | 16 | 1.4562 |
| **IDA** | 249699 | 249685 | 16 | 0.4206 |
| **Djikstra** | 197609 | 497291 | 16 | 3.5185 |
| **Greedy (Euclidean)** | - | - | - | - |
| **A\* (Euclidean)** | 181 | 411 | 16 | 0.0030 |

DFS: Not Possible (Infinite Search Tree)

Greedy (Euclidean): My poor laptop (4.6Ghz with 16gb ram) cant handle it </3

Custom Board:

[ "P--------%",

"%-%%%-%%-%",

"%---%----%",

"%-%-%%%-%%",

"%-%------%",

"%----%%%--",

"%----%---."]

Farmer Puzzle:

Initial state always set to [False,False,False,False], with goal state always [True,True,True,True].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Algorithm (+Heuristic)** | **Nodes Expanded** | **Nodes Generated** | **Solution Cost** | **Time Taken (sec)** |
| **DFS** | - | - | - | - |
| **BFS** | 16707 | 36555 | 14 | 0.1139 |
| **IDA** | 30677 | 30665 | 14 | 0.0567 |
| **Djikstra** | 16723 | 36711 | 14 | 0.1944 |
| **Greedy (Hamming)** | - | - | - | - |
| **A\* (Hamming)** | 221 | 479 | 14 | 0.0020 |

DFS: Not Possible (Infinite Search Tree)