Assignment 2 Demo

Comp 472

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Heuristics

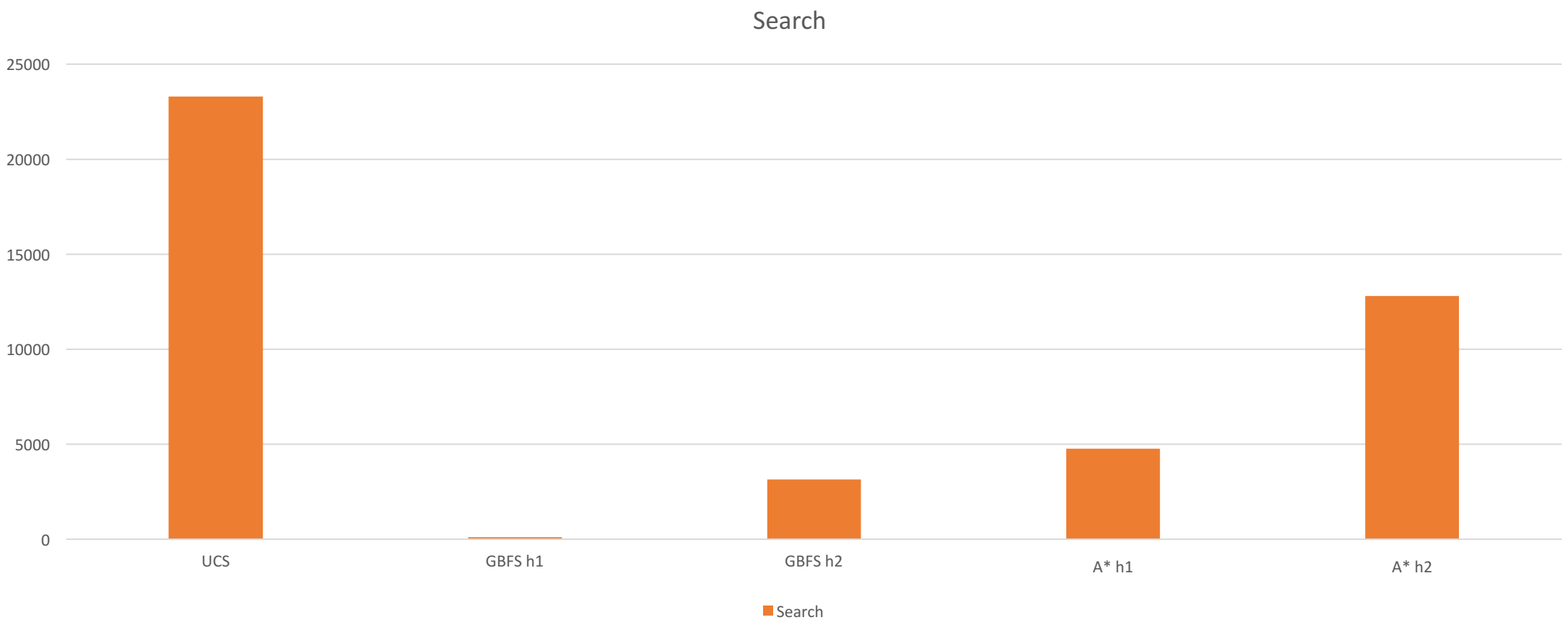
- H1 : Modified Hamming Distance
  - Calculates lowest hamming distance for each goal state
  - Modified by lowering the cost of a move to the lowest possible movement cost per tile (cost 2, moves 3)
  - Movement tile (0) not counted, for efficiency, since there are at least 2 wrong tiles if it isn’t the goal state

Heuristics

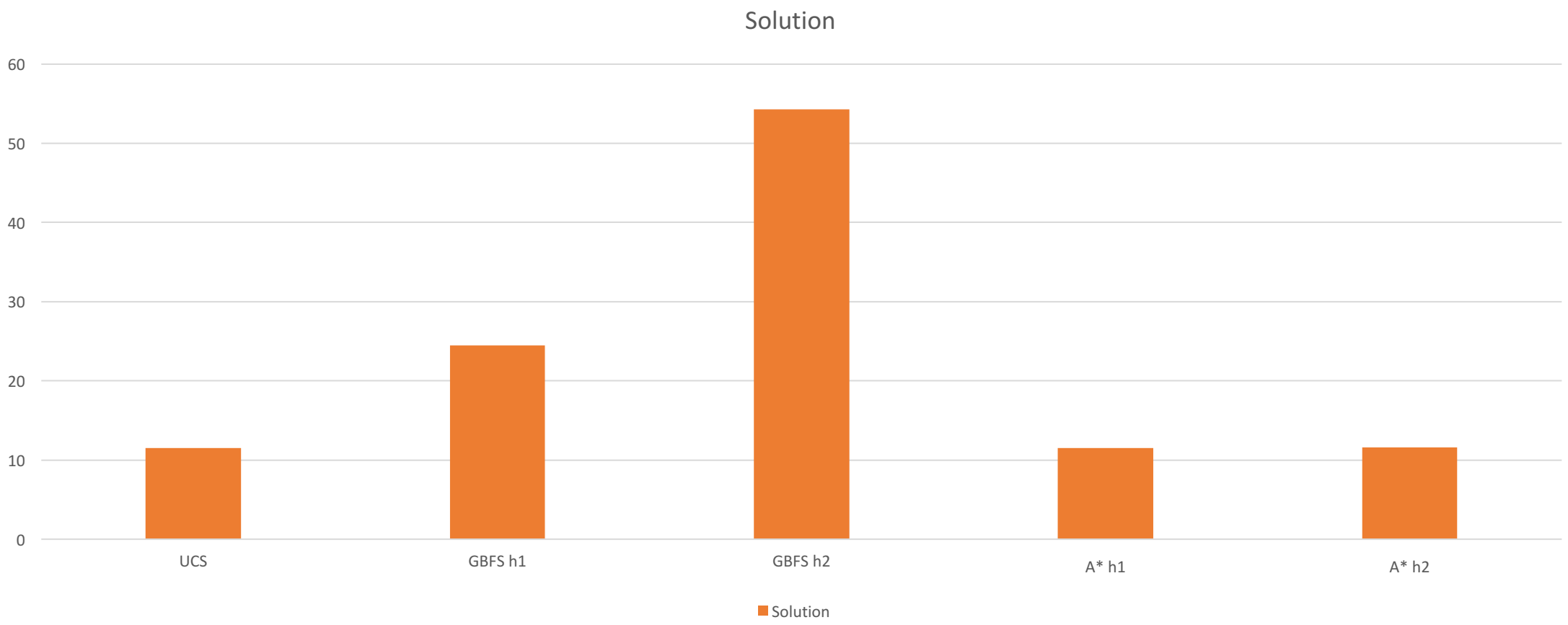
- H2 : Modified Manhattan Distance

  - Calculates lowest Manhattan distance for each goal state
  - Each move can have a maximum value of 2, since a distance of 3 might only cost 2. (A distance of 4 might cost 3
  - Movement tile (0) not counted, for efficiency, since there are at least 2 wrong tiles if it isn’t the goal state

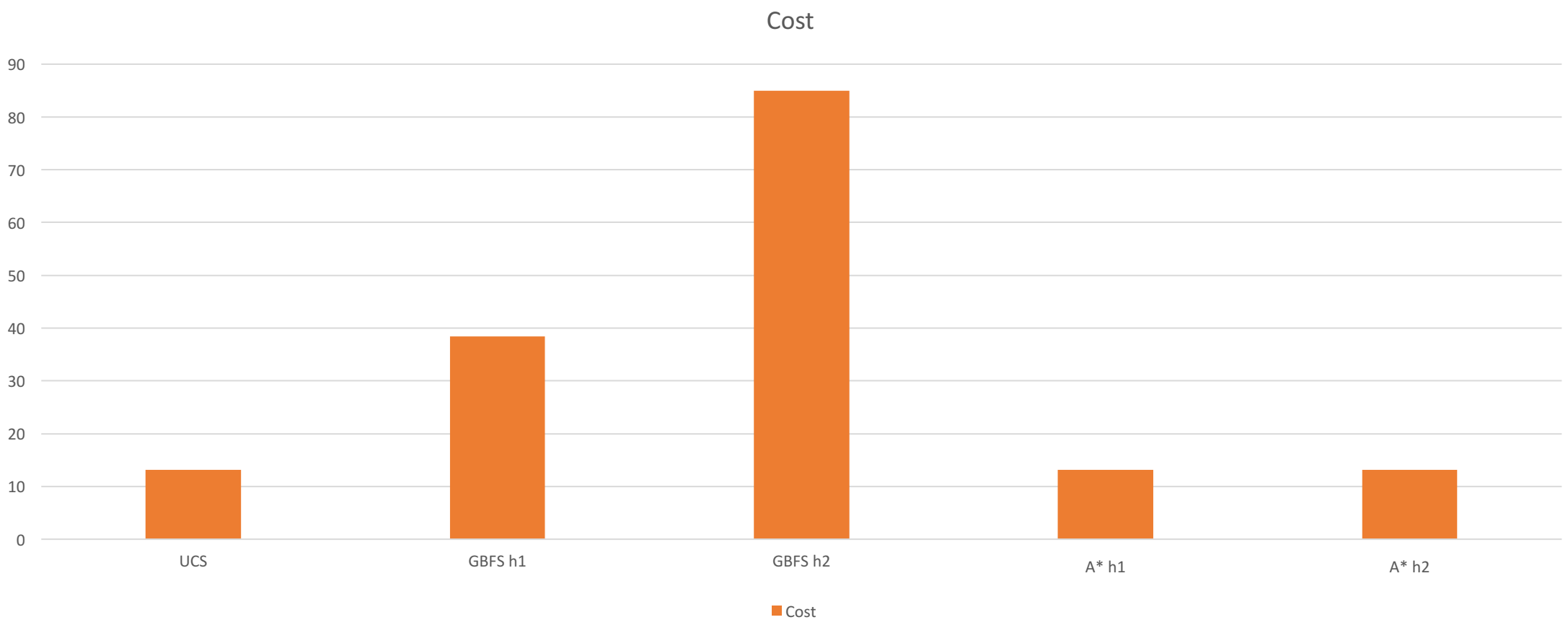
Analysis


Search
25000
20000
15000
10000
5000
0
UCS
GBFS h1
GBFS h2
A* h1
A* h2
Search

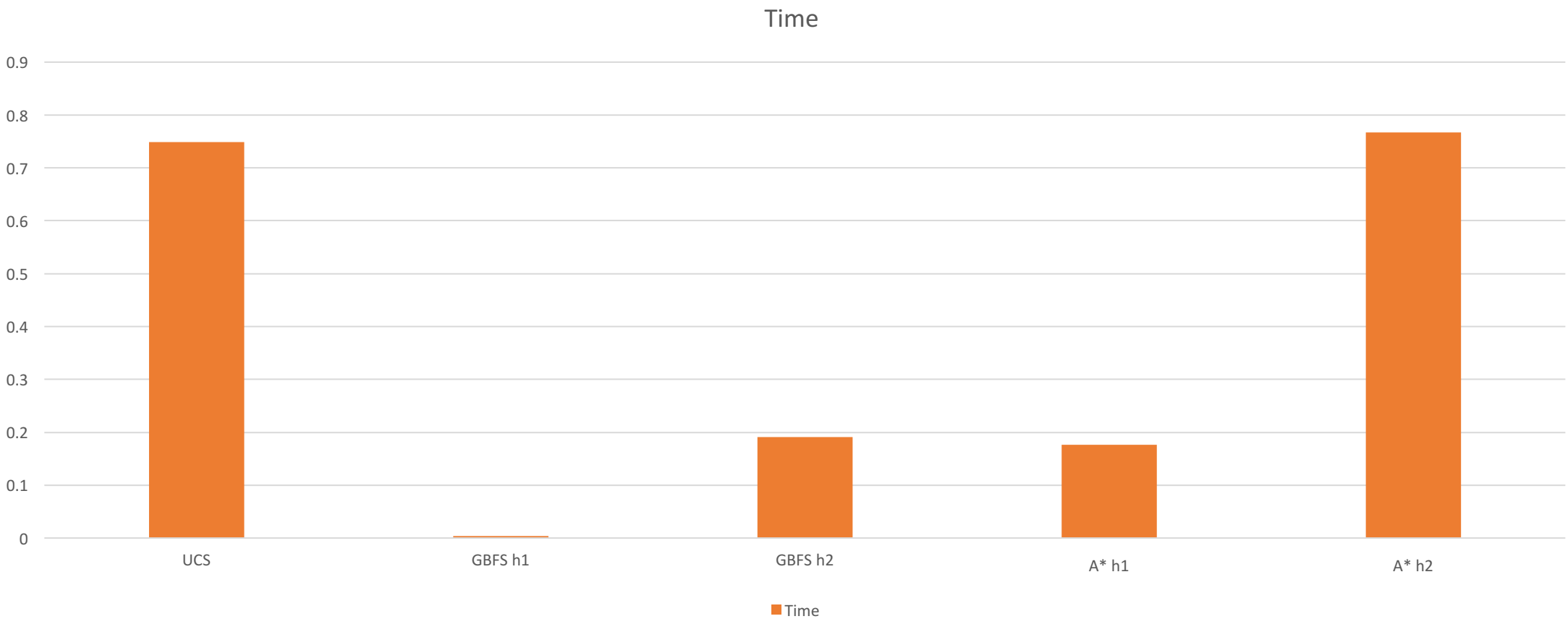
Analysis


Solution
60
50
40
30
20
10
0
UCS
GBFS h1
GBFS h2
A* h1
A* h2
Solution

Analysis



Analysis



Analysis

- A* with h1 provides good balance of speed and path length, while guaranteeing optimality
- GBFS provides fastest speeds, regardless of heuristic used.
- GBFS found path was , on average 3.15x more costly than optimal for h1, and 4.5x more costly than optimal for h2

Extended puzzle

- Using GBFS with h1
  - Initially tried a*, too slow & memory-intensive
  - Algorithm could be more efficient
- Modifying puzzle length (4, 5, 6)

Extended puzzle