

COMP 472

Mini Project 2

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Demo

1. Presentation of Code

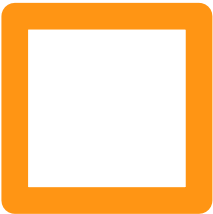
2. Presentation of Analysis

- Overview of Heuristics
- Solution Length
- Solution Execution Time
- Interesting Facts

Overview of Heuristics



- H1:** The number of blocking vehicles in front of the ambulance.
- H2:** The number of blocked spaces in front of the ambulance.
- H3:** H1 multiplied by a constant of 5.
- H4:** The number of blocking vehicles in front of the ambulance
+ the number of vehicles blocking the path of the cars blocking the ambulance



	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>
1	I	I	B	.	.	.
2	C	.	B	H	H	H
3	C	.	A	A	D	.
4	.	.	.	.	D	.
5	E	E	G	G	G	F
6	.	.	.	.	.	F

H1 = 1
H2 = 1
H3 = 5
H4 = 3

Analysis: Length of Solutions

Heuristic	Count of Heuristic	Average of Length of the Solution
Heuristic 1	100	14.34375
A*	50	13.47916667
GBFS	50	15.20833333
Heuristic 2	100	14.34375
A*	50	13.47916667
GBFS	50	15.20833333
Heuristic 3	100	15
A*	50	14.79166667
GBFS	50	15.20833333
Heuristic 4	100	14.44791667
A*	50	13.58333333
GBFS	50	15.3125
N/A	50	13.47916667
UCS	50	13.47916667
Grand Total	450	14.41666667

Table 1: Average Length of the Solution for each Heuristic

Algorithm	Count of Algorithm	Average of Length of the Solution
A*	200	13.83333333
Heuristic 1	50	13.47916667
Heuristic 2	50	13.47916667
Heuristic 3	50	14.79166667
Heuristic 4	50	13.58333333
GBFS	200	15.234375
Heuristic 1	50	15.20833333
Heuristic 2	50	15.20833333
Heuristic 3	50	15.20833333
Heuristic 4	50	15.3125
UCS	50	13.47916667
N/A	50	13.47916667
Grand Total	450	14.41666667

Table 2: Average length of the solution for each algorithm

Analysis: Execution Time

Heuristic	Count of Heuristic	Average of Execution Time (in seconds)
Heuristic 1	100	17.2574
A*	50	23.9388
GBFS	50	10.576
Heuristic 2	100	17.375
A*	50	24.0788
GBFS	50	10.6712
Heuristic 3	100	11.7325
A*	50	12.8044
GBFS	50	10.6606
Heuristic 4	100	11.5571
A*	50	15.0896
GBFS	50	8.0246
N/A	50	29.8596
Grand Total	450	16.18928889

Table 3: Average Execution Time for Each Heuristic

Algorithm	Count of Algorithm	Average of Execution Time (in seconds)
A*	200	18.9779
Heuristic 1	50	23.9388
Heuristic 2	50	24.0788
Heuristic 3	50	12.8044
Heuristic 4	50	15.0896
GBFS	200	9.9831
Heuristic 1	50	10.576
Heuristic 2	50	10.6712
Heuristic 3	50	10.6606
Heuristic 4	50	8.0246
UCS	50	29.8596
N/A	50	29.8596
Grand Total	450	16.18928889

Table 4: Average Execution Time for each algorithm

Analysis: Interesting Facts

1. Execution Time Performance:

We were able to notice a great increase in performance as we closed auxiliary programs that were running in the background, in some cases, halving our execution time.

2.

Algorithm	Moves To Complete	Execution Time (in seconds)
A*		
Heuristic 1	51	38.76
Heuristic 2	51	40.04
Heuristic 3	53	26.61
Heuristic 4	51	33.42
GBFS		
Heuristic 1	54	17.68
Heuristic 2	54	17.72
Heuristic 3	54	17.92
Heuristic 4	57	15.0
UCS		
N/A	51	37.03

Table 5: Execution Time and Moves for “Hardest Rush Hour Game”



Thank you