

Graphs for hw3

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The numbers of test samples I used are through 1 to 20 except 17.

1 Uninformed search

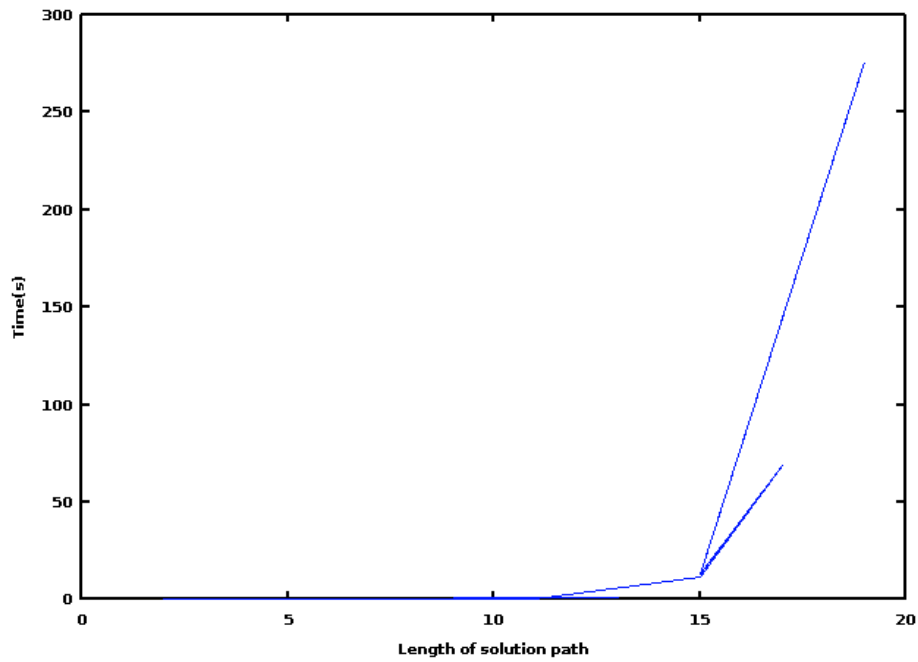


Figure 1: The time cost(s) and the length of solution path in uninformed search

Experimental result shows below.

Table 1: Experimental results of uninformed search

Problem number	Length of solution path	Time(s)
1	6	0.001956939697265625
2	4	0.0004558563232421875
3	2	5.602836608886719e-05
4	6	0.0015571117401123047
5	4	0.0004520416259765625
6	9	0.03304100036621094
7	3	0.00014495849609375
8	5	0.0005011558532714844
9	5	0.0007290840148925781
10	5	0.001007080078125
11	9	0.02097797393798828
12	9	0.06315898895263672
13	13	0.9659819602966309
14	5	0.0010759830474853516
15	11	0.19655299186706543
16	15	11.44983696937561
18	17	68.86690998077393
19	15	13.28905200958252
20	19	276.18528294563293

2 Informed search(h1)

The h1 function is the number of misplaced tiles.

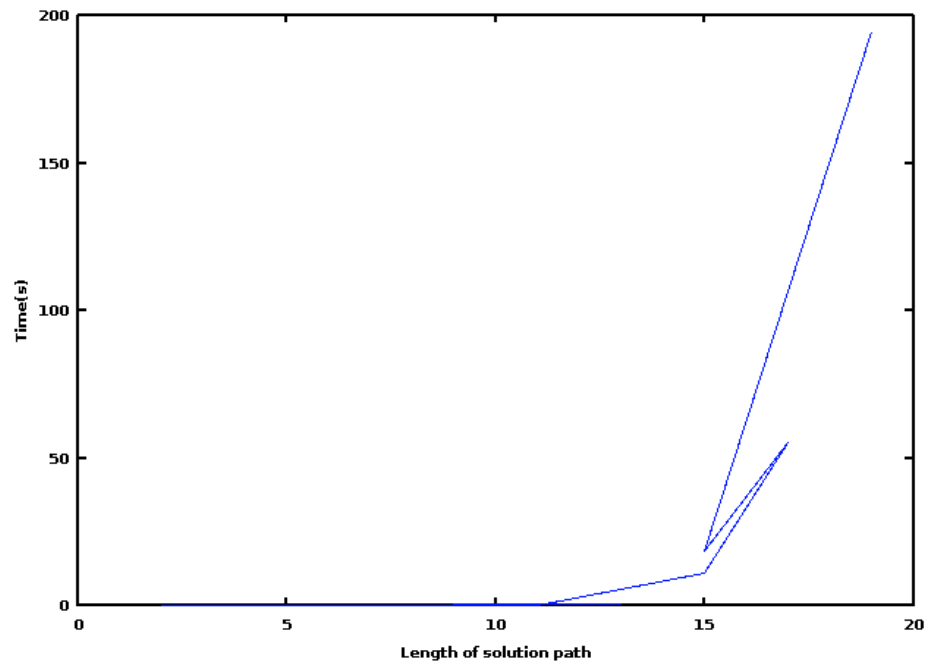


Figure 2: The time cost(s) and the length of solution path in informed search with heuristic function $h1$

Experimental result shows below.

Table 2: Experimental results of informed search(h1)

Problem number	Length of solution path	Time(s)
1	6	0.00025010108947753906
2	4	0.0001709461212158203
3	2	5.698204040527344e-05
4	6	0.0002620220184326172
5	4	0.0002009868621826172
6	9	0.02200007438659668
7	3	9.989738464355469e-05
8	5	0.0002110004425048828
9	5	0.0002701282501220703
10	5	0.00019097328186035156
11	9	0.016025066375732422
12	9	0.04271197319030762
13	13	0.7884721755981445
14	5	0.0002219676971435547
15	11	0.11528301239013672
16	15	11.352113962173462
18	17	55.4756019115448
19	15	18.732638120651245
20	19	194.611093044281

3 Informed search(h2)

The h2 function is written by my own, that is the subtractions of the tiles in current state and the tiles in goal state. It still needs improvement in performance.

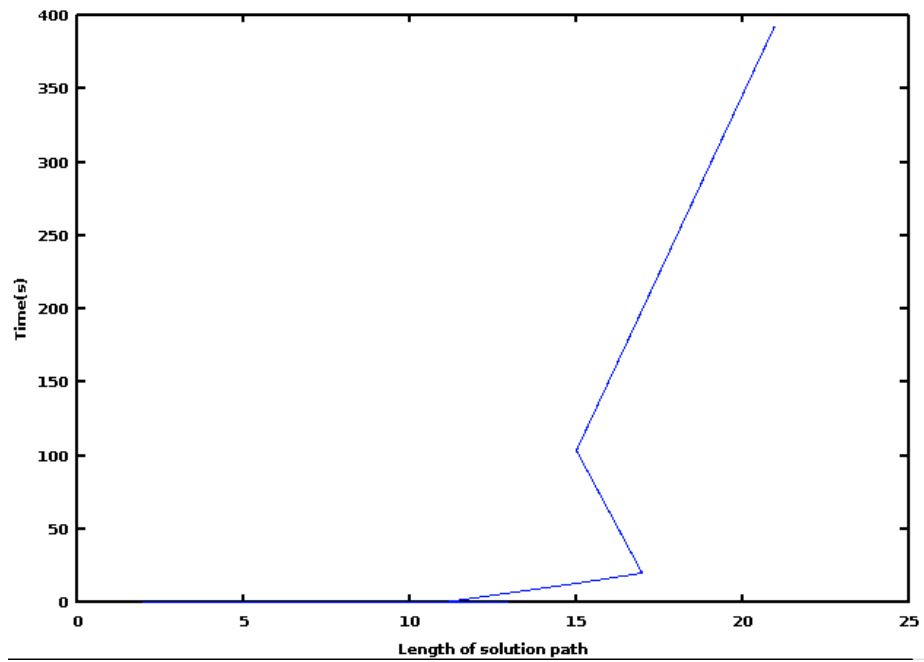


Figure 3: The time cost(s) and the length of solution path in informed search with heuristic function h_2

Experimental result shows below.

Table 3: Experimental results of informed search(h2)

Problem number	Length of solution path	Time(s)
1	6	0.0002880096435546875
2	4	0.000347137451171875
3	2	0.00010013580322265625
4	6	0.0006811618804931641
5	4	0.0004029273986816406
6	9	0.0008001327514648438
7	3	0.00018405914306640625
8	5	0.00027298927307128906
9	5	0.0003020763397216797
10	5	0.0003871917724609375
11	9	0.0006659030914306641
12	9	0.0007989406585693359
13	13	0.005901813507080078
14	5	0.0005559921264648438
15	11	0.5104520320892334
16	15	13.110538005828857
18	17	20.030537843704224
19	15	104.06644606590271
20	19	392.7996838092804