(1) Change the heuristic function for the two search programs, and compare the number of searched nodes and solution depth for one simple case(A\* d<20) and one hard case(A\* d>25) . Write your discussion.

(2) Develop another heuristic H3 for the A\* algorithm. Compare with H0, H1, and H2.

The simple case

5

1 2 0 1 2

2 1 2 1 0

#generated node

|  |  |  |  |
| --- | --- | --- | --- |
|  | H0(h=0) | H1(h=differences) | H2(h=distances) |
| Greedy Search | 15 | 26 | 43 |
| A\* | 13 | 17 | 22 |

depth

|  |  |  |  |
| --- | --- | --- | --- |
|  | H0 | H1 | H2 |
| Greedy Search | 4 | 4 | 8 |
| A\* | 4 | 4 | 4 |

The hard case

8

0 1 2 3 4 5 6 7

7 6 5 4 1 2 3 0

#generated node

|  |  |  |  |
| --- | --- | --- | --- |
|  | H0(h=0) | H1(h=differences) | H2(h=distances) |
| GBFS | 1767 | 1453 | 1026 |
| A\* | 32883 | 29923 | 39732 |

depth

|  |  |  |  |
| --- | --- | --- | --- |
|  | H0 | H1 | H2 |
| GBFS | 91 | 87 | 75 |
| A\* | 27 | 35 | 27 |

Discussion

在較難的題目A\*雖然深度比較淺但跑的數量比較多，

Greedy雖然跑比較深但他跑得比較少，

A\*在簡單的題目裡面比較吃香。r

(2)

#generated node

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | H0 | H1 | H2 | H3 |
| A\* | 32883 | 29923 | 39732 | 33998 |

Depth

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | H0 | H1 | H2 | H3 |
| A\* | 27 | 35 | 27 | 29 |