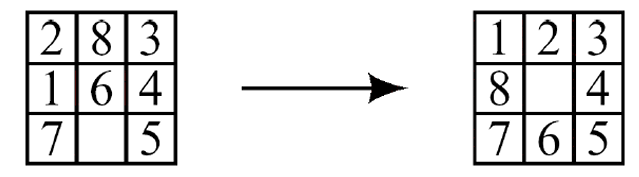
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NRP : 5025231185

Kelas : KKA D

**Tugas Individu 2**

1. Selesaikan 8 Puzzle dengan Greedy Best First Search



* Untuk Menghitung heuristicnya, kita akan menghitung dengan menggunakan Manhattan distance pada setiap kotak yang salah. Manhattan distance adalah jarak x + y antara kotak salah dengan tujuan. Contohnya pada state awal, total Manhattan distance dari 1-8 adalah : 1 + 1 + 0 + 0 + 0 + 1 + 0 + 2 = 5
* Berikut adalah penyelesaian puzzle, dengan step kiri, atas, kanan, bawah

|  |  |  |
| --- | --- | --- |
| 5 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 |  | 5 |

|  |  |  |
| --- | --- | --- |
| 6 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
|  | 7 | 5 |

|  |  |  |
| --- | --- | --- |
| 4 | | |
| 2 | 8 | 3 |
| 1 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 6 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 | 5 |  |

|  |  |  |
| --- | --- | --- |
| 5 | | |
| 2 | 8 | 3 |
| 1 | 4 |  |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 3 | | |
| 2 |  | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 5 | | |
| 2 | 8 | 3 |
|  | 1 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 5 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 |  | 5 |

|  |  |  |
| --- | --- | --- |
| 2 | | |
|  | 2 | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 4 | | |
| 2 | 3 |  |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 4 | | |
| 2 | 8 | 3 |
| 1 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 3 | | |
| 2 |  | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 1 | | |
| 1 | 2 | 3 |
|  | 8 | 4 |
| 7 | 6 | 5 |

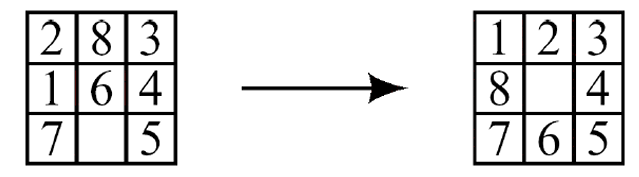
|  |  |  |
| --- | --- | --- |
| 0 | | |
| 1 | 2 | 3 |
| 8 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 2 | | |
|  | 2 | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 2 | | |
| 1 | 2 | 3 |
| 7 | 8 | 4 |
|  | 6 | 5 |

* Jadi didapatkan untuk total cost adalah 5

2. Selesaikan 8 puzzle dengan A\* dan heuristic adalah Manhattan distance



* Perbedaan A\* dan Greedy Best First Search adalah A\* yang memiliki gCost g(x) dan fCost f(x). Untuk menghitung gCost, adalah dengan menambahkan jumlah step yang dilakukan dari awal. Sedangkan fCost adalah gCost ditambah heuristic.

|  |  |  |
| --- | --- | --- |
| 0 + 5 = 5 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 |  | 5 |

|  |  |  |
| --- | --- | --- |
| 1 + 6 = 7 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
|  | 7 | 5 |

|  |  |  |
| --- | --- | --- |
| 1 + 4 = 5 | | |
| 2 | 8 | 3 |
| 1 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 1 + 6 = 7 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 | 5 |  |

|  |  |  |
| --- | --- | --- |
| 2 + 5 = 7 | | |
| 2 | 8 | 3 |
| 1 | 4 |  |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 2 + 3 = 5 | | |
| 2 |  | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 2 + 5 = 7 | | |
| 2 | 8 | 3 |
|  | 1 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 2 + 5 = 7 | | |
| 2 | 8 | 3 |
| 1 | 6 | 4 |
| 7 |  | 5 |

|  |  |  |
| --- | --- | --- |
| 3 + 2 = 5 | | |
|  | 2 | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 3 + 4 = 7 | | |
| 2 | 3 |  |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 3 + 4 = 7 | | |
| 2 | 8 | 3 |
| 1 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 4 + 3 = 7 | | |
| 2 |  | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 4 + 1 = 5 | | |
| 1 | 2 | 3 |
|  | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 5 + 2 = 7 | | |
|  | 2 | 3 |
| 1 | 8 | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 5 + 0 = 5 | | |
| 1 | 2 | 3 |
| 8 |  | 4 |
| 7 | 6 | 5 |

|  |  |  |
| --- | --- | --- |
| 5 + 2 = 7 | | |
| 1 | 2 | 3 |
| 7 | 8 | 4 |
|  | 6 | 5 |

* Jadi didapatkan actual cost adalah 5.