Artificial Intelligence

Searching Algorithms

Project Documentation

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Github Link: https://github.com/yaraamrsalah/Searching-Algorithms-Python

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1. Introduction

Searching algorithms are techniques used for problem-solving in artificial intelligence. They are considered to be one of the most crucial AI aspects. There are multiple different algorithms. That said, this program only implements 5:

1. A Star
2. Breadth-First Search
3. Depth-First Search
4. Uniform-Cost Search
5. Greedy Best First Search.

2. The Program

The program works when user inputs their data. They are asked to enter the starting city, the destination city, and to choose an algorithm.

2.1. Running Example

```
Choose an Algorithm:
1. A Star
2. Breadth First Search (BFS)
3. Depth First Search (DFS)
4. Uniform-Cost Search (UCS)
5. Greedy Best First Search (GBFS)

Your Choice: 4
Enter Your Starting City
Arad
Enter Your Destination City
Bucharest
```

```
*-------------------------------------UCS IMPLEMENTATION-------------------------------------*

Expand Node | Fringe
--------------------
-           | (0, 'Arad')
Arad        | (75, 'Zerind'), (118, 'Timisoara'), (140, 'Sibiu')
Zerind      | (118, 'Timisoara'), (140, 'Sibiu'), (146, 'Oradea')
Timisoara   | (140, 'Sibiu'), (146, 'Oradea'), (229, 'Lugoj')
Sibiu       | (146, 'Oradea'), (220, 'RimnicuVilcea'), (239, 'Fagaras'), (229, 'Lugoj')
Oradea      | (220, 'RimnicuVilcea'), (229, 'Lugoj'), (239, 'Fagaras')
RimnicuVilcea | (229, 'Lugoj'), (239, 'Fagaras'), (317, 'Pitesti'), (366, 'Craiova')
Lugoj       | (239, 'Fagaras'), (299, 'Mehadia'), (317, 'Pitesti'), (366, 'Craiova')
Fagaras     | (299, 'Mehadia'), (366, 'Craiova'), (317, 'Pitesti'), (450, 'Bucharest')
Mehadia     | (317, 'Pitesti'), (366, 'Craiova'), (450, 'Bucharest'), (374, 'Dobreta')
Pitesti     | (366, 'Craiova'), (374, 'Dobreta'), (450, 'Bucharest'), (418, 'Bucharest')
Craiova     | (374, 'Dobreta'), (418, 'Bucharest'), (450, 'Bucharest')
Dobreta     | (418, 'Bucharest'), (450, 'Bucharest')
Bucharest   |
Path: Arad => Sibiu => RimnicuVilcea => Pitesti => Bucharest
Cost: 418

Process finished with exit code 0
```