**Search Algorithm for 8 puzzles**

**Implantation**

This module will have the search algorithms methods. Each of this method takes an initial state and the Goal states and returns the solution to reach the goals.

**DFS**

In the graph search we have both frontier and explored list, to prevent exploring a same state.

Steps

1. We put the initial state in the explored list.
2. We delete this state from the frontier
3. We put the initial states child in the frontier
4. We choose the last child if it is not in the explored list, then we explore it and put it in the explored list.
5. We do this to reach the goal state

**BFS**

In the graph search we have both frontier and explored list, to prevent exploring a same state.

Steps

1. We put the initial state in the explored list.
2. We delete this state from the frontier
3. We put the initial states child in the frontier
4. We choose the last child if it is not in the explored list, then we explore it and put it in the explored list.
5. We do this to reach the goal state

**BFS**

In the graph search we have both frontier and explored list, to prevent exploring a same state.

Steps

1. We put the initial state in the explored list.
2. We delete this state from the frontier
3. We put the initial states child in the frontier
4. We choose the last child.
5. Check if this child has the depth limit or not, if not then step 6
6. if the child is not in the explored list, then we explore it and put it in the explored list.
7. We do this until we reach to the limit depth

**IDS**

In the graph search we have both frontier and explored list, to prevent exploring a same state.

Steps

1. We put the initial state in the explored list.
2. We delete this state from the frontier
3. We put the initial states child in the frontier
4. We choose the last child if it is not in the explored list, then we explore it and put it in the explored list.
5. We do this to reach the goal state

**UCS**

In the graph search we have both frontier and explored list, to prevent exploring a same state.

Steps

1. We put the initial state in the explored list.
2. We delete this state from the frontier
3. We put the initial states child in the frontier
4. We calculate each child cost
5. We choose the child with the minimum cost, if it is not in the explored list, then we explore it and put it in the explored list.
6. We do this to reach the goal state