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*Practical No.3:Write a program to implement A\* search algorithm*

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Input:

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from simpleai.search import SearchProblem,astar

GOAL= 'HELLO WORLD'

class HelloProblem(SearchProblem):
    def actions(self,state):
        if len(state) < len(GOAL):
            return list('ABCDEFGHIJKLMNOPQRSTUVWXYZ ')
        else:
            return []

    def result(self, state, action):
        return state + action

    def is_goal(self,state):
        return state == GOAL

    def heuristic(self,state):
        wrong = sum([1 if state[i] != GOAL[i] else 0 for i in range(len(state))])
        missing = len(GOAL)-len(state)
        return wrong + missing

problem = HelloProblem(initial_state="")
result = astar(problem)

print(result.state)
print(result.path())
```

Output:

```
HELLO WORLD
[(None, ''), ('H', 'H'), ('E', 'HE'), ('L', 'HEL'), ('L', 'HELL'), ('O', 'HELLO'), (' ', 'HELLO '), ('W', 'HELLO W'), ('O', 'HELLO WO'), ('R', 'HELLO WOR'), ('L', 'HELLO WORL'), ('D', 'HELLO WORLD')]
```