



```
10 src=[1,2,3,-1,4,5,6,7,8]
11 target=[1,2,3,4,5,-1,6,7,8]
12 def gen(state,m,b):
13     temp=state[:]
14     if m=='l':
15         temp[b],temp[b-1]=temp[b-1],temp[b]
16     if m=='r':
17         temp[b],temp[b+1]=temp[b+1],temp[b]
18     if m=='u':
19         temp[b],temp[b-3]=temp[b-3],temp[b]
20     if m=='d':
21         temp[b],temp[b+3]=temp[b+3],temp[b]
22     return temp
23
24 def possible_moves(state, visited_states):
25     b = state.index(-1)
26     d = []
27     pos_moves = []
28     if b <= 5:
29         d.append("d")
30     if b >= 3:
31         d.append("u")
32     if b % 3 > 0:
33         d.append("l")
34     if b % 3 < 2:
35         d.append("r")
36     for i in d:
37         temp = gen(state, i, b)
38         if not temp in visited_states:
39             pos_moves.append(temp)
40     return pos_moves
41 def search(src, target, visited_states, g):
42     if src == target:
43         return visited_states
44     visited_states.append(src),
45     adj = possible_moves(src, visited_states)
46     scores = []
47     selected_moves = []
48     for move in adj:
49         scores.append(h(move) + g)
50     min_score = min(scores)
51     for i in range(len(adj)):
52         if scores[i] == min_score:
53             selected_moves.append(adj[i])
54     for move in selected_moves:
55         if search(move, target, visited_states, g + 1):
56             return visited_states
57     return 0
58 def solve(src, target):
59     visited_states = []
60     res = search(src, target, visited_states, 0)
61
62     if type(res) != type(int()):
63         i = 0
64         for state in res:
65             display(state)
66             i += 1
67         display(target)
68         print("Total moves made: ", i + 1)
69
70
71 def display(state):
72     for i in range(9):
73         if i % 3 == 0:
74             print()
75         if state[i] == -1:
76             print(state[i], end="    ")
77         else:
78             print(state[i], end="    ")
79     print(end="\n")
80
81 print("Source State: ")
82 display(src)
83 print("Target State: ")
84 display(target)
85 print("Solving using DFS: ")
86
87 solve(src, target)
```

× Terminal

DFS method to solve 8 Puzzle
Source State:

1	2	3
-1	4	5
6	7	8

Target State:

1	2	3
4	5	-1
6	7	8

Solving using DFS:

1	2	3
-1	4	5
6	7	8

1	2	3
4	-1	5
6	7	8

1	2	3
4	5	-1
6	7	8

Total moves made: 3

Process finished.