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LAB - 1
(AI)

Name: Shreya Laddha
USN: 1BM18CS103

1. Implement IDS algorithm using suitable heuristic function where 'd' should not be greater than 4.

```
def dfs(src, target, limit, visited_states):
    if src == target:
        return True

    if limit <= 0 or limit > 4:
        return False

    visited_states.append(src)

    adj = possible_moves(src, visited_states)

    for move in adj:
     if dfs(move, target, limit-1, visited_state)
     ~~for move in adj:~~ return True
      ~~if dfs(move~~

      ~~df~~

    return false

def possible_moves(state, visited_state):
    b = state.index(-1)
    d = []
    if b+3 in range(9):
        d.append('d')
```

[illegible]

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```
if b-3 in range(9):
    d.append('u')
if b not in ~~rano~~ [0,3,6]:
    d.append('l')
if b not in [2,5,8]:
    d.append('r')
pos_moves = []
~~pos_mo~~ for move in d:
        pos_move.append(gen(state,move,b))

 return [move for move in pos_moves if move
         not in visited_states]

def gen(state, m, b):
    temp = state.copy()
    if m == 'd':
        a= temp[b+3]
        tem[b+3] = temp[b]
        temp[b] = a
    elif m == 'u':
        a = temp[b-3]
        temp[b-3] = temp[b]
        temp[b] = a
```

[illegible]

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```
elif m=='l':
    a = temp[b-1]
    temp[b-1] = temp[b]
    tmp[b] = a
elf m=='r'
    a = temp[b+1]
    temp[b+1] = temp[b]
    temp[b] = a
return temp

# ids function
def iddfs(src, target, depth):
    visited_states = []
    for i in range(1, depth+1):
        if dfs(src, target, i, visited_state):
            return True
    return false.
```

[illegible]