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LAB-3

8 puzzle problem:-

```
def dfs( src, target, limit, visited_states):

    if src == target:
        return True.
    if limit <= 0:
        return False

    visited states.append (src)
    adj. = possible moves ( src, visited_states)

    for mov in adj:
        if dfs ( move, target, limit-1, visited_states):
            return True.
    return False.

def possible_moves( state, visited states):

    indx = state .index (-1)

    d=[]

    if ind+3 in range (9):
        d. append ('d')
    if ind-3 in range (9):
        d. append ('u')
    if ind not in [0,3,6]:
        d. append ('l')
    if ind not in [2,5,8]:
        d. append ('r')
```

```
pos_moves = []

for move in d:
        pos_moves.append(gen(state, move, ind))

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]
        temp[b+3] = temp[b]
        temp[b] = a
    elif m == 'u':
        a = temp[b-3]
        temp[b-3] = temp[b]
        temp[b] = a
    elif m == 'l':
        a = temp[b-1]
        temp[b-1] = temp[b]
        temp[b] = a
    elif m == 'r':
        a = temp[b+1]
        temp[b+1] = temp[b]
        temp[b] = a
    return temp
```

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```
def iddfs ( src, target , dupth):
    visited - status[ ]
    for i in range ( 1 , dupth +1 ):
            if dfs ( src, target , i , visited_status):
                return True
    return False.
```