

```

In [1]: from copy import deepcopy

class State:
    def __init__(self, pai, matriz):
        self.pai = pai
        self.matriz = matriz

def initialState():
    return State(None, [[2, 6, 1], [4, 5, 9], [6, 3, 7]])

def showState(s):
    for linha in s.matriz:
        print(linha)
    print("")

def goal(s):
    return s.matriz == [[1, 2, 3], [4, 5, 6], [7, 8, 9]]

def expand(s):
    ret = []

    for i in range(3):
        aux = deepcopy(s.matriz)
        linha = aux[i]
        linha[0], linha[1], linha[2] = linha[2], linha[0], linha[1]
        ret.append(State(s, aux))

    for i in range(3):
        aux = deepcopy(s.matriz)
        aux[0][i], aux[1][i], aux[2][i] = aux[2][i], aux[0][i], aux[1][i]
        ret.append(State(s, aux))

    return ret

def showPath(s):
    if s == None:
        return
    showPath(s.pai)
    showState(s)

queue = []

def enqueue(s):
    queue.append(s)

def dequeue():
    return queue.pop(0)

s = initialState()
enqueue(s)

while(queue):
    s = dequeue()

    if(goal(s)):
        showPath(s)
        break

    children = expand(s)
    for child in children:
        enqueue(child)

```

KeyboardInterrupt