**5.Write the python program for Missionaries Cannibal problem**

**PROGRAM:**

from collections import deque

def is\_valid(state):

m, c, b = state

if m < 0 or c < 0 or m > 3 or c > 3:

return False

if (m > 0 and m < c) or (3 - m > 0 and 3 - m < 3 - c):

return False

return True

def get\_successors(state):

m, c, b = state

moves = [(1, 0), (0, 1), (1, 1), (2, 0), (0, 2)]

successors = []

for dm, dc in moves:

if b == 1:

new\_state = (m - dm, c - dc, 0)

else:

new\_state = (m + dm, c + dc, 1)

if is\_valid(new\_state):

successors.append(new\_state)

return successors

def bfs():

start = (3, 3, 1)

goal = (0, 0, 0)

queue = deque([(start, [start])])

visited = set()

while queue:

state, path = queue.popleft()

if state == goal:

return path

for succ in get\_successors(state):

if succ not in visited:

visited.add(succ)

queue.append((succ, path + [succ]))

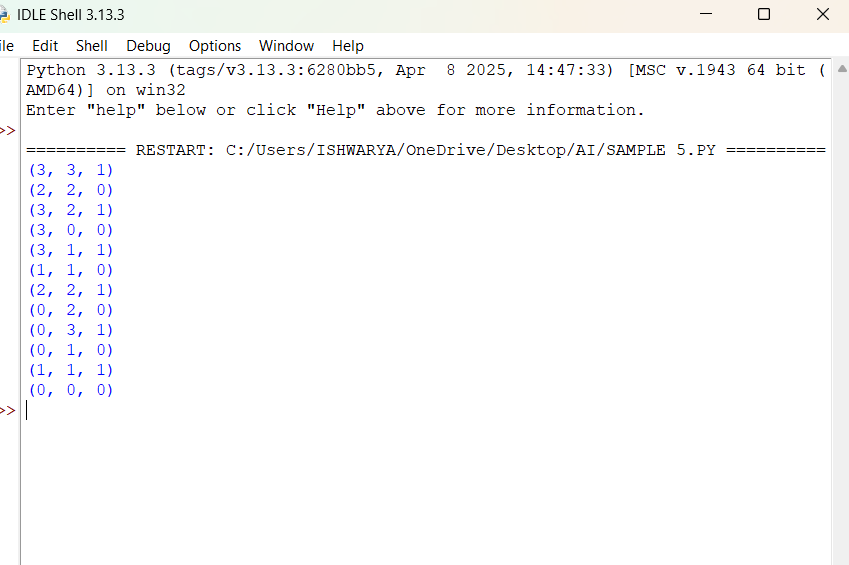
return None

solution = bfs()

for step in solution:

print(step)

**OUTPUT:**

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