EXPERIMENT =05 Missionaries-Cannibals (BFS)

AIM:

Get all across safely (3 missionaries, 3 cannibals).

CODE:

# missionaries\_cannibals.py

from collections import deque

def valid(m,c):

return 0<=m<=3 and 0<=c<=3 and (m==0 or m>=c)

def solve():

start=(3,3,0) # M,C,boat(0=left)

goal=(0,0,1)

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

q=deque([start]); parent={start:None}

while q:

m,c,b=q.popleft()

if (m,c,b)==goal:

path=[]; cur=(m,c,b)

while cur: path.append(cur); cur=parent[cur]

return list(reversed(path))

for dm,dc in moves:

if b==0:

nm, nc, nb = m-dm, c-dc, 1

else:

nm, nc, nb = m+dm, c+dc, 0

if valid(nm,nc) and valid(3-nm,3-nc):

nxt=(nm,nc,nb)

if nxt not in parent:

parent[nxt]=(m,c,b); q.append(nxt)

return None

if \_\_name\_\_=='\_\_main\_\_':

for s in solve(): print(s)

OUTPUT:

