EXP-5 MISSIONARIES CANNIBAL PROBLEM

PROGRAM

from collections import deque

def is\_valid(h,c):

return (h==0 or h>=c) and (3-h==0 or 3-h>=3-c)

def solve():

start =(3,3,1)

goal =(0,0,0)

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

visited =set()

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

while queue:

(h,c,b),path=queue.popleft()

if(h,c,b) in visited: continue

visited.add((h,c,b))

path=path+[(h,c,b)]

if(h,c,b)==goal: return path

for dh,dc in moves:

if b:

nh,nc,nb =h-dh,c-dc,0

else:

nh,nc,nb=h+dh,c+dc,1

if 0<=nh<=3 and 0<=nc<=3 and is\_valid(nh,nc):

queue.append(((nh,nc,nb),path))

return None

path=solve()

for i,(h,c,b) in enumerate(path):

hl,cl=h,c

hr,cr=3-h,3-c

side ="Left" if b else "Right"

print(f"Step {i}: Left: {hl}H {cl}C | Right: {hr}H {cr}C | Boat: {side}")

OUTPUT

