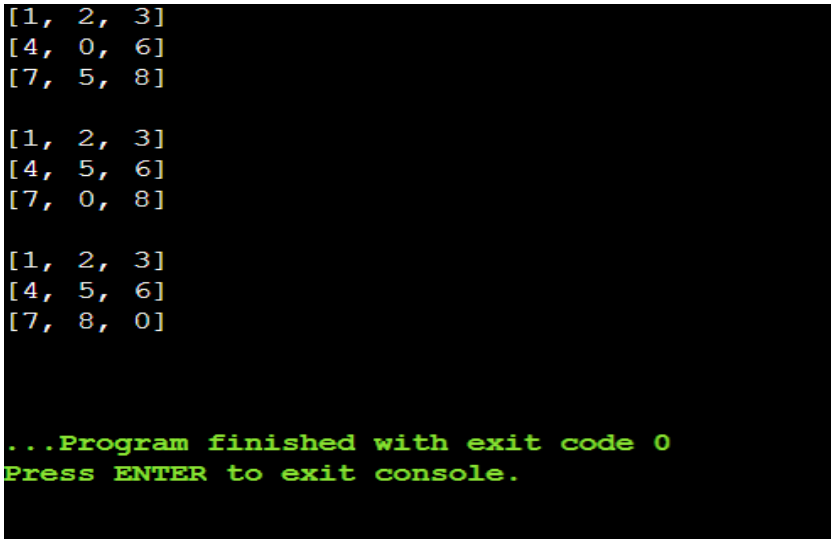
EXPERIMENT:01 Write the Python Program to solve 8-Puzzle Problem.

PROGRAM:

```
from collections import deque

GOAL = [[1,2,3],[4,5,6],[7,8,0]]
DIRS = [(-1,0),(1,0),(0,-1),(0,1)]

def find_blank(s): return [(i,j) for i in range(3) for j in range(3) if s[i][j]==0][0]
def clone(s): return [r[:] for r in s]

def bfs(start):
    q, visited = deque([(start, [])]), set()
    while q:
        state, path = q.popleft()
        if state == GOAL: return path + [state]
        b = tuple(sum(state, []))
        if b in visited: continue
        visited.add(b)
        i,j = find_blank(state)
        for di,dj in DIRS:
            ni,nj = i+di,j+dj
            if 0<=ni<3 and 0<=nj<3:
                new = clone(state)
                new[i][j], new[ni][nj] = new[ni][nj], new[i][j]
                q.append((new, path+[state]))

start_state = [[1,2,3],[4,0,6],[7,5,8]]
for step in bfs(start_state):
    for row in step: print(row)
    print()
```

OUTPUT:


[1, 2, 3]
[4, 0, 6]
[7, 5, 8]
[1, 2, 3]
[4, 5, 6]
[7, 0, 8]
[1, 2, 3]
[4, 5, 6]
[7, 8, 0]
...Program finished with exit code 0
Press ENTER to exit console.