

Program 1

8 Puzzle Problem

AIM :

To Create a python program to find a solution to the 8 Puzzle Problem.

PROGRAM :

```
D={(1,2,3,4,5,6,7,8,0):0}
E=D.copy()

def Z(a,d):
    b=list(a)
    b[i],b[i+d]=b[i+d],0
    b=tuple(b)
    if b not in E:
        E[b]=a
        D[b]=D[a]+1

for x in range(32):
    for a in E.copy():
        i=list(a).index(0)
        if i>2:
            Z(a,-3)
        if i%3:
            Z(a,-1)
        if i%3<2:
            Z(a,1)
        if i<6:
            Z(a,3)

g=[]
for x in range(3):
    g+=map(int,input().split())

g=tuple(g)
if g in E:
    print(D[g])
    while g:
        for i in (0,3,6):
            print('%d %d %d'%g[i:i+3])
        g=E[g]
        print()
else:
    print( -1)
```

OUTPUT:

```
Type help , copyright , credits or license() for more information.
>>>
===== RESTART: C:\Users\Rahul\OneDrive\Desktop\AI\8puzzle.py =====
1 2 3
0 4 6
7 5 8
3
1 2 3
0 4 6
7 5 8

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
>>> |
```

RESULT:

The Program has successfully been executed.