

```

1  import numpy as np
2
3  if __name__ == "__main__":
4      A = np.matrix([[ 0,  1,  0, -1,  0,  0],
5                     [ 0,  0,  1,  1, -1,  0],
6                     [-1,  0,  0,  0, -1, -1],
7                     [ 1,  0,  0,  0,  1,  0],
8                     [ 0,  1,  0,  0,  0,  1],
9                     [ 0,  0,  1,  1,  0,  0]])
10
11     B = (A * A + np.identity(6))
12     for i in range(1, 4):
13         # print(B, end="\n")
14         if not np.count_nonzero(B):
15             print(i)
16         B = B * B
17
18     B = A - 1j * np.identity(6)
19     for i in range(1, 4):
20         C = A + 1j * np.identity(6)
21         for k in range(1, 4):
22             # print(B * C, end="\n\n")
23             if not np.count_nonzero(B * C):
24                 print((i, k))
25             C = C * C
26         B = B * B
27
28     print("-" * 50)
29
30     print("\n+i")
31
32     B = A - 1j * np.identity(6)
33     for i in range(1, 4):
34         print(np.linalg.matrix_rank(B))
35         B = B * B
36
37     print("\n-i")
38
39     C = A + 1j * np.identity(6)
40     for i in range(1, 4):
41         print(np.linalg.matrix_rank(C))
42         C = C * C
43
44     """
45     output:
46
47     3
48     (3, 3)
49     -----
50
51     +i
52     5
53     4
54     3
55
56     -i
57     5
58     4
59     3
60
61     """

```