scratch.py

```python
import numpy as np

if __name__ == "__main__":
    A = np.matrix([[ 0,  1,  0, -1,  0,  0],
        [ 0,  0,  1,  1, -1,  0],
        [-1,  0,  0,  0, -1, -1],
        [ 1,  0,  0,  0,  1,  0],
        [ 0,  1,  0,  0,  0,  1],
        [ 0,  0,  1,  1,  0,  0]])

    B = (A * A + np.identity(6))
    for i in range(1, 4):
        # print(B, end="\n")
        if not np.count_nonzero(B):
            print(i)
        B = B * B

    B = A - 1j * np.identity(6)
    for i in range(1, 4):
        C = A + 1j * np.identity(6)
        for k in range(1, 4):
            # print(B * C, end="\n\n")
            if not np.count_nonzero(B * C):
                print((i, k))
            C = C * C
        B = B * B

    print("-" * 50)

    print("\n+i")

    B = A - 1j * np.identity(6)
    for i in range(1, 4):
        print(np.linalg.matrix_rank(B))
        B = B * B

    print("\n-i")

    C = A + 1j * np.identity(6)
    for i in range(1, 4):
        print(np.linalg.matrix_rank(C))
        C = C * C

"""
output:

3
(3, 3)
--------------------------------------------------

+i
5
4
3

-i
5
4
3

"""
```