Introduction to Programming

The Eight Queens Puzzle

The Eight Queens Puzzle asks you to discover all possible ways that eight queens could be placed on a chessboard so that no queen could “capture” any other on the next move.

In class, we discussed a “dumb” algorithm for solving this problem.

**Here is a code outline for one possible way to solve the problem:**

```python
def duplicates(q):
    fill this in

def diagonal_threat(q):
    fill this in

count=0
for i0 in range(8):
    for i1 in range(8):
        for i2 in range(8):
            ...
            ...
            fill this in
            ...
            ...
    q=[ fill this in ]
    if duplicates(q) or diagonal_threat(q):
        continue
    count+=1
    print('solution ',count,': ',q)
```

**Assignment:**

Write a program to generate and print all the solutions to the Eight Queens Puzzle. Print each solution on its own line. Here are the first 35 (out of 92) solutions that my program printed.
>>> Solution number 1 is: [0, 4, 7, 5, 2, 6, 1, 3]
>>> Solution number 2 is: [0, 5, 7, 6, 3, 1, 4]
>>> Solution number 3 is: [0, 6, 3, 5, 7, 1, 4, 2]
>>> Solution number 4 is: [0, 6, 4, 7, 1, 3, 5, 2]
>>> Solution number 5 is: [1, 3, 5, 7, 2, 0, 6, 4]
>>> Solution number 6 is: [1, 4, 6, 0, 2, 7, 5, 3]
>>> Solution number 7 is: [1, 4, 6, 3, 0, 7, 5, 2]
>>> Solution number 8 is: [1, 5, 0, 6, 3, 7, 2, 4]
>>> Solution number 9 is: [1, 5, 7, 2, 0, 3, 6, 4]
>>> Solution number 10 is: [1, 6, 2, 5, 7, 4, 0, 3]
>>> Solution number 11 is: [1, 6, 4, 7, 0, 3, 5, 2]
>>> Solution number 12 is: [1, 7, 5, 0, 2, 4, 6, 3]
>>> Solution number 13 is: [2, 0, 6, 4, 7, 1, 3, 5]
>>> Solution number 14 is: [2, 4, 1, 7, 0, 6, 3, 5]
>>> Solution number 15 is: [2, 4, 1, 7, 5, 3, 6, 0]
>>> Solution number 16 is: [2, 4, 6, 0, 3, 1, 7, 5]
>>> Solution number 17 is: [2, 4, 7, 3, 0, 6, 1, 5]
>>> Solution number 18 is: [2, 5, 1, 4, 7, 0, 6, 3]
>>> Solution number 19 is: [2, 5, 1, 4, 0, 3, 7, 4]
>>> Solution number 20 is: [2, 5, 4, 6, 0, 3, 7, 4]
>>> Solution number 21 is: [2, 5, 3, 1, 7, 0, 4, 6, 3]
>>> Solution number 22 is: [2, 5, 3, 1, 7, 0, 4, 6, 0]
>>> Solution number 23 is: [2, 5, 7, 0, 3, 6, 4, 1]
>>> Solution number 24 is: [2, 5, 7, 0, 4, 6, 1, 3]
>>> Solution number 25 is: [2, 5, 7, 1, 3, 0, 6, 4]
>>> Solution number 26 is: [2, 6, 1, 7, 4, 0, 3, 5]
>>> Solution number 27 is: [2, 6, 1, 7, 5, 3, 0, 4]
>>> Solution number 28 is: [2, 7, 3, 6, 0, 5, 1, 4]
>>> Solution number 29 is: [3, 0, 4, 7, 1, 0, 6, 2]
>>> Solution number 30 is: [3, 0, 4, 7, 5, 2, 6, 1]
>>> Solution number 31 is: [3, 1, 4, 7, 5, 0, 2, 6]
>>> Solution number 32 is: [3, 1, 6, 2, 5, 7, 0, 4]
>>> Solution number 33 is: [3, 1, 6, 2, 5, 7, 4, 0]
>>> Solution number 34 is: [3, 1, 6, 4, 0, 7, 5, 2]
>>> Solution number 35 is: [3, 1, 7, 4, 6, 0, 2, 5]