class NQueens:

def \_\_init\_\_(self) -> None:

self.size = int(input("Enter size of chessboard: "))

self.board = [[False]\*self.size for \_ in range(self.size)]

self.count = 0

def printBoard(self):

for row in self.board:

for ele in row:

if ele == True:

print("Q",end=" ")

else:

print("X",end=" ")

print()

print()

def isSafe(self,row:int,col:int) -> bool:

# Check Column(above and below of the (row,col))

for i in self.board:

if i[col] == True:

return False

# Check backward slash(\) diagonal only in above direction

i = row

j = col

while i >= 0 and j >= 0:

if self.board[i][j] == True:

return False

i -= 1

j -= 1

# Check backward slash(\) diagonal only in below direction

i = row

j = col

while i < self.size and j < self.size:

if self.board[i][j] == True:

return False

i += 1

j += 1

# Check forward slash diagonal(/) only in above direction

i = row

j = col

while i >= 0 and j < self.size:

if self.board[i][j] == True:

return False

i -= 1

j += 1

# Check forward slash diagonal(/) only in below direction

i = row

j = col

while i < self.size and j >= 0:

if self.board[i][j] == True:

return False

i += 1

j -= 1

return True

def set\_position\_first\_queen(self):

print("Enter coordinates of first queen: ")

row = int(input(f"Enter row (1-{self.size}): "))

col = int(input(f"Enter column (1-{self.size}): "))

self.board[row-1][col-1] = True

self.printBoard()

def solve(self,row:int):

if row == self.size:

self.count += 1

self.printBoard()

return

if any(self.board[row]) is True:

self.solve(row+1)

return

for col in range(self.size):

if self.isSafe(row,col) == True:

self.board[row][col] = True

self.solve(row+1)

self.board[row][col] = False

def displayMessage(self):

if self.count > 0:

print("Solution exists for the given position of the queen.")

else:

print("Solution doesn't exist for the given position of the queen.")

solver = NQueens()

solver.set\_position\_first\_queen()

solver.solve(0)

solver.displayMessage()

--------------------------------------------------------------------------------------------------------------------------------

Output:

> %Run -c $EDITOR\_CONTENT

Enter size of chessboard: 4

Enter coordinates of first queen:

Enter row (1-4): 2

Enter column (1-4): 1

X X X X

Q X X X

X X X X

X X X X

X X Q X

Q X X X

X X X Q

X Q X X

Solution exists for the given position of the queen.