

A8_Assignment

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Class: TE A Batch: A

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class NQueens:

```
def __init__(self, N):
```

```
    self.N = N
```

```
    self.board = [[0] * N for _ in range(N)]
```

```
    self.column = [False] * N
```

```
    self.diagonal1 = [False] * (2 * N - 1)
```

```
    self.diagonal2 = [False] * (2 * N - 1)
```

```
def solve(self, row=0):
```

```
    if row == self.N:
```

```
        self.print_solution()
```

```
        return True
```

```
    for col in range(self.N):
```

```
        if not self.is_safe(row, col):
```

```
            continue
```

```
    self.place_queen(row, col)
```

```
    if self.solve(row + 1):
```

```
        return True # Return true to get one solution only
```

```
    self.remove_queen(row, col)
```

```
    return False
```

```
def is_safe(self, row, col):
```

```
    return not (self.column[col] or self.diagonal1[row - col + self.N - 1] or self.diagonal2[row + col])
```

```

def place_queen(self, row, col):

    self.board[row][col] = 1

    self.column[col] = True

    self.diagonal1[row - col + self.N - 1] = True

    self.diagonal2[row + col] = True


def remove_queen(self, row, col):

    self.board[row][col] = 0

    self.column[col] = False

    self.diagonal1[row - col + self.N - 1] = False

    self.diagonal2[row + col] = False


def print_solution(self):

    for row in self.board:

        print(" ".join("Q" if col else "." for col in row))

    print("\n")


if __name__ == "__main__":

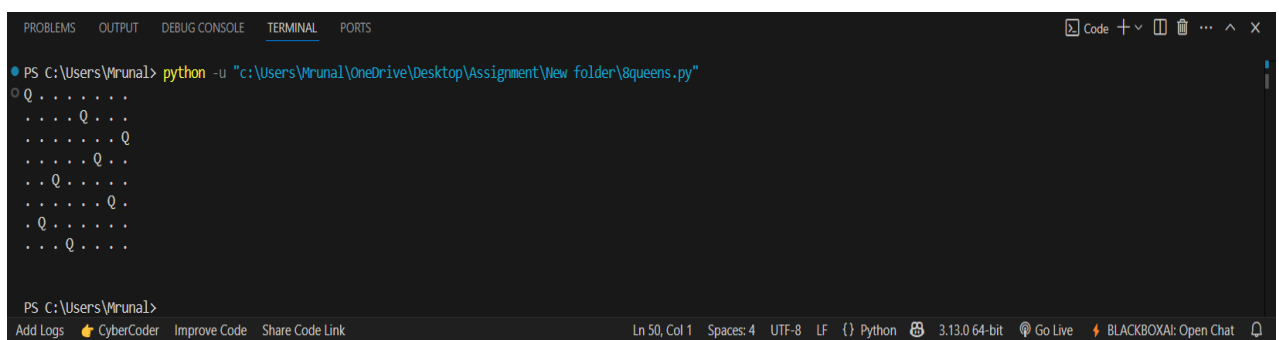
    N = 8 # You can change this value

    solver = NQueens(N)

    if not solver.solve():

        print("No solution exists.")

```



```

PS C:\Users\Mrunal> python -u "c:\Users\Mrunal\OneDrive\Desktop\Assignment\New folder\8queens.py"
Q . . . . .
. . . . Q . .
. . . . . Q
. . . . . Q .
. . . . Q . .
. . Q . . . .
. . . . . Q .
. Q . . . . .
. Q . . . . .
. . . Q . . .

```

PS C:\Users\Mrunal>

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