




25-09-2021

ARTIFICIAL INTELLIGENCE
PRACTICAL 3
ROLL No. 2109805

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CLASS: TYBSc CS
ROLL No: 2109805
SUBJECT: ARTIFICIAL INTELLIGENCE



Practical 3: N-Queen

Q1) Demonstrate N Queens Problem and give a solution

Ans:

[nqueen.py](#)

```
"""
```

```
nqueen.py
```

```
Author: Jagrut Gala
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Date: 24-07-2021
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Practical: 3
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```
Objective: Demonstrate N Queens Problem and give a solution
```

```
"""
```

```
global N
```

```
N = 8
```

```
def generateBoard(size: int) -> list:
```

```
    board= list()
```

```
    for i in range(size):
```

```
        l= []
```

```
        for j in range(size):
```

```
            l.append(0)
```

```
        board.append(l)
```

```
    return(board)
```

```
def printSolution(board):
```

```
    for i in range(N):
```

```
        for j in range(N):
```

```
            print (board[i][j],end = " ")
```

```
        print()
```

```
def isSafe(board, row, col):
```

```
    # Check this row on left side
```

```
    for i in range(col):
```

```
        if board[row][i] == 1:
```

```
            return False
```

```
    # Check upper diagonal on left side
```

```
    for i, j in zip(range(row, -1, -1),range(col, -1, -1)):
```

```
        if board[i][j] == 1:
```

```
            return False
```

```
    # Check lower diagonal on left side
```

```
    for i, j in zip(range(row, N, 1),range(col, -1, -1)):
```

```
        if board[i][j] == 1:
```

```
            return False
```

```
    return True
```

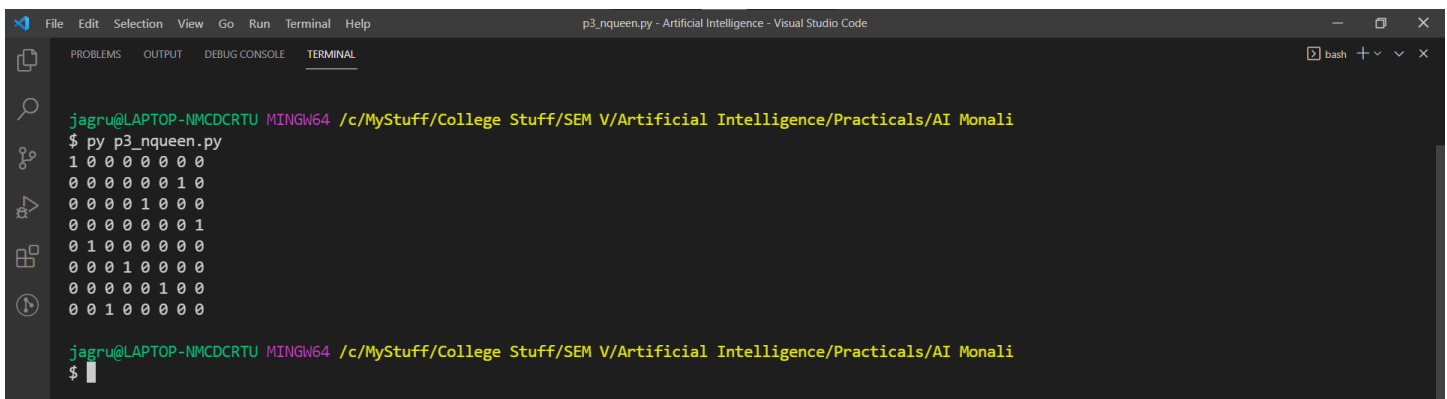
```
def solveNQUtil(board, col):
    if col >= N:
        return True
    for i in range(N):
        if isSafe(board, i, col):
            # Place this queen in board[i][col]
            board[i][col] = 1
            # recur to place rest of the queens
            if solveNQUtil(board, col + 1) == True:
                return True
            board[i][col] = 0
    return False

def solveNQ():
    board = generateBoard(8)

    if solveNQUtil(board, 0) == False:
        print ("Solution does not exist")
        return False

    printSolution(board)
    return True

# Driver Code
solveNQ()
```



```
p3_nqueen.py - Artificial Intelligence - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
jagru@LAPTOP-NMDCRTU MINGW64 /c/MyStuff/College Stuff/SEM V/Artificial Intelligence/Practicals/AI Monali
$ py p3_nqueen.py
1 0 0 0 0 0 0 0
0 0 0 0 0 0 1 0
0 0 0 0 1 0 0 0
0 0 0 0 0 0 0 1
0 1 0 0 0 0 0 0
0 0 0 1 0 0 0 0
0 0 0 0 0 1 0 0
0 0 1 0 0 0 0 0
jagru@LAPTOP-NMDCRTU MINGW64 /c/MyStuff/College Stuff/SEM V/Artificial Intelligence/Practicals/AI Monali
$
```