220701077

classmate

Date
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EXP NO : 1 - N QUEENS.

AIM:

To write the program for N-queens problem and execute it successfully.

PROCEDURE:

1) Function n queens (N):
2) CREATE a board of size N x N filled with 0.
3) If solve-n-queens (board, 0, N) is TRUE.
4) PRINT the board.
5) ELSE
6) PRINT " solution does not exist"
7) Function solve-n-queens (board, col, N):
8) If col >= N:
9) Return True.
10) For each row FROM 0 to n-1:
11) If is-safe (board, row, col, N) is TRUE:
12) Place queen at (row, col):
13) If solve-n-queen (board, col + 1, N) is true:
14) RETURN True
15) Remove queen from (row, col)
16) Return FALSE
17) Function is-safe (board, row, col, N):
18) For each column Left of (row, col):
19) check row, upper diagonal and Lower diagonal.
20) If any queen is found in those directions.
21) RETURN False
22) RETURN TRUE.

PROGRAM :

```
def print_board (board):
    for row in board:
        print (" ".join)
    print ("\n")
def is_large (board, row, col, n):
    for i in range (col):
        if board.range (col):
            if board [row][i] = -1
            return false :

for i, j in zip (range (row), -1, -1), range (col, -1, -1
    if board [i] [i] == 1:
        return false
for i, j in zip (range (row, n, 1) range (col, -1, -1)):
    if board [i][i] == 1:
        return false.
return true

def solve_n_queen (board, col, n):
    if col >= n:
        return trul.
    for i= in range (n):
        if is_safe (board, i, col, n) :
            board [i] [col] = 1
        if solve_n_queens (board, col+1, n):
            return trul
        board [i] [col] = 0
    return false.

def n_queens (n):
    board = [[0] * n for in range (n)]
    if not solve_n_queens (board, 0, n):
        print ("Solution does not exist").
```

```
        return false
    print_board(board)
    return true
try:
    n = int(input("Enter the value of N (size of board):"))
    if n <= 0:
        print("please enter a positive integer:").
    else:
        n_queens(n)
except ValueError:
    print("Invalid input! Please enter a valid integer:")
```

OUTPUT:

```
Enter the value of N (size of board): 4
0 0 1 0
1 0 0 0
0 0 0 1
0 1 0 0
```

RESULT:

Thus the program is successfully executed and output is verified.