4 queens using hill climbing

```
import random


def calculate_conflicts(board):
    conflicts = 0
    n = len(board)
    for i in range(n):
        for j in range(i + 1, n):
            if board[i] == board[j] or abs(board[i] - board[j]) == abs(i - j):
                conflicts += 1
    return conflicts


def hill_climbing(n):
    cost=0
    while True:
        # Initialize a random board
        current_board = list(range(n))
        random.shuffle(current_board)
        current_conflicts = calculate_conflicts(current_board)

        while True:
            # Generate neighbors by moving each queen to a different position
            found_better = False
    for i in range(n):
        for j in range(n):
            if j != current_board[i]: # Only consider different positions
                neighbor_board = list(current_board)
                neighbor_board[i] = j
                neighbor_conflicts = calculate_conflicts(neighbor_board)
                if neighbor_conflicts < current_conflicts:
                    print_board(current_board)
                    print(current_conflicts)
                    print_board(neighbor_board)
                    print(neighbor_conflicts)
                    current_board = neighbor_board
                    current_conflicts = neighbor_conflicts
                    cost+=1
                    found_better = True
                    break
        if found_better:
            break

    # If no better neighbor found, stop searching
    if not found_better:
        break

# If a solution is found (zero conflicts), return the board
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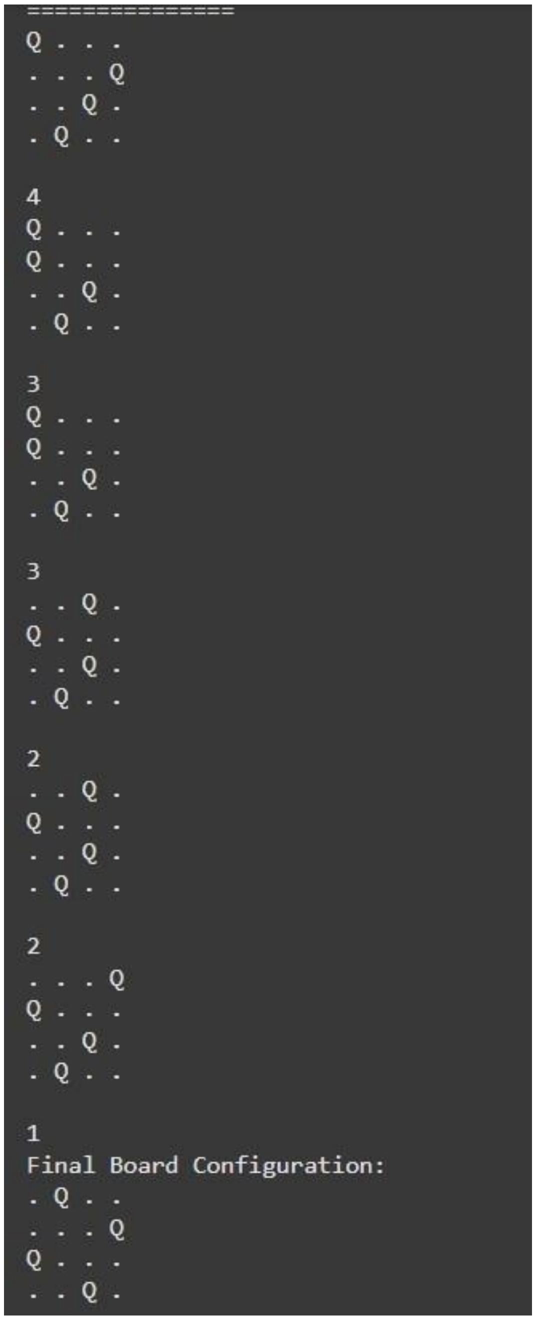
        if current_conflicts == 0:
            return current_board, current_conflicts, cost


def print_board(board):
    n = len(board)
    for i in range(n):
        row = ['.'] * n
        row[board[i]] = 'Q' # Place a queen
        print(' '.join(row))
    print()
print("==============")
# Example Usage
n = 4
solution, conflicts, cost = hill_climbing(n)
print("Final Board Configuration:")
print_board(solution)
print("Number of Cost:", cost)
```



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Q . . .
. . . Q
. . Q .
. Q . .

4
Q . . .
Q . . .
. . Q .
. Q . .

3
Q . . .
Q . . .
. . Q .
. Q . .

3
. . Q .
Q . . .
. . Q .
. Q . .

2
. . Q .
Q . . .
. . Q .
. Q . .

2
. . . Q
Q . . .
. . Q .
. Q . .

1
Final Board Configuration:
. Q . .
. . . Q
Q . . .
. . Q .
```