

```

1  def solve_n_queens(n):
2      solutions = []
3      board = [['.' * n for _ in range(n)]]
4
5      def is_valid(row, col):
6          for i in range(row):
7              if board[i][col] == 'Q' or \
8                  col - (row - i) >= 0 and board[i][col - (row - i)] == 'Q' or \
9                  col + (row - i) < n and board[i][col + (row - i)] == 'Q':
10                 return False
11             return True
12
13     def place_queens(row):
14         if row == n:
15             solutions.append(''.join(row) for row in board)
16             return
17         for col in range(n):
18             if is_valid(row, col):
19                 board[row][col] = 'Q'
20                 place_queens(row + 1)
21                 board[row][col] = '.'
22
23     place_queens(0)
24     return solutions
25
26 # Usage
27 print("4-Queens Solutions:\n", solve_n_queens(4))
28 print("5-Queens Solutions:\n", solve_n_queens(5))
29 print("8-Queens Solutions:\n", solve_n_queens(8))
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```

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[Running] python -u "c:\Users\hp\OneDrive\Desktop\project_directory\tempCodeRunnerFile.python"
```

4-Queens Solutions:

```
[['.Q..', '...Q', 'Q...', '..Q.'], ['..Q.', 'Q...', '...Q', '.Q..']]
```

5-Queens Solutions:

8-Queens Solutions:

```

1 def generalized_n_queens(n, rows, cols, obstacles=set(), restrictions=set()):
2     board = [['.' * cols for _ in range(rows)]]
3     solutions = []
4
5     def is_valid(row, col):
6         if (row, col) in obstacles or col < 0 or col >= cols:
7             return False
8         for i in range(row):
9             if board[i][col] == 'Q' or \
10                col - (row - i) >= 0 and board[i][col - (row - i)] == 'Q' or \
11                col + (row - i) < cols and board[i][col + (row - i)] == 'Q':
12                 return False
13         return True
14
15     def place_queens(row):
16         if row == n:
17             solutions.append(''.join(row) for row in board)
18             return
19         for col in range(cols):
20             if is_valid(row, col) and (row, col) not in restrictions:
21                 board[row][col] = 'Q'
22                 place_queens(row + 1)
23                 board[row][col] = '.'
24
25     place_queens(0)
26     return solutions
27
28 # Examples
29 print("8x10 Board Solutions:\n", generalized_n_queens(8, 8, 10))
30 print("5x5 with obstacles:\n", generalized_n_queens(5, 5, 5, obstacles={(2, 2), (4, 4)}))
31 print("6x6 with Restrictions:\n", generalized_n_queens(6, 6, 6, restrictions={(0, 2), (0, 4)}))
32

```



```
1 def solve_sudoku(board):
2     def is_valid(r, c, val):
3         box_r, box_c = 3 * (r // 3), 3 * (c // 3)
4         return all(val != board[r][i] for i in range(9)) and \
5             all(val != board[i][c] for i in range(9)) and \
6             all(val != board[box_r + i // 3][box_c + i % 3] for i in range(9))
7
8     def solve():
9         for r in range(9):
10             for c in range(9):
11                 if board[r][c] == '.':
12                     for num in map(str, range(1, 10)):
13                         if is_valid(r, c, num):
14                             board[r][c] = num
15                             if solve():
16                                 return True
17                             board[r][c] = '.'
18                     return False
19         return True
20
21     solve()
22     return board
23
24 # Sudoku Example
25 board = [[["5","3",".", ".", ".", "7",".", ".", ".", "."],["6",".", ".", ".", "1","9","5",".", ".", ".", "."],[".", ".", "9","8",".", ".", ".", ".", ".", "6"],["6",".", ".", ".", "2","8",".", ".", ".", ".", "4"],[".", ".", "7",".", ".", ".", ".", ".", "2","9"],["8",".", ".", ".", "6",".", ".", ".", "3",".", ".", "1"],["7",".", ".", ".", "2",".", ".", ".", ".", "6"],[".", ".", "6",".", ".", ".", ".", "2","8",".", "."],[".", ".", ".", ".", "4","1","9",".", ".", ".", "5"],[".", ".", ".", ".", "8",".", ".", ".", "7","9"]]]
26
27 print("Solved Sudoku:\n", solve_sudoku(board))
28
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Code

Done exited with code=0 in 0.608 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.py"

Solved Sudoku:

[[['5', '3', '4', '6', '7', '8', '9', '1', '2'], ['6', '7', '2', '1', '9', '5', '3', '4', '8'], ['1', '9', '8', '3', '4', '2', '5', '6', '7'], ['8', '5', '9', '7', '6', '1', '4', '2', '3'], ['4', '2', '6', '8', '5', '3', '7', '9', '1'], ['7', '1', '3', '9', '2', '4', '8', '5', '6'], ['9', '6', '1', '5', '3', '7', '2', '8', '4'], ['2', '8', '7', '4', '1', '9', '6', '3', '5'], ['3', '4', '5', '2', '8', '6', '1', '7', '9']]]

```

1 def target_sum(nums, target):
2     from functools import lru_cache
3
4     @lru_cache(None)
5     def backtrack(i, current_sum):
6         if i == len(nums):
7             return 1 if current_sum == target else 0
8             return backtrack(i + 1, current_sum + nums[i]) + backtrack(i + 1, current_sum - nums[i])
9
10    return backtrack(0, 0)
11
12 # Example
13 print("Target Sum (nums=[1,1,1,1,1], target=3):", target_sum([1, 1, 1, 1, 1], 3))
14 |

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.347 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Target Sum (nums=[1,1,1,1,1], target=3): 5

[Done] exited with code=0 in 0.209 seconds

```
1 def sum_subarray_mins(arr):
2     stack, result = [], 0
3     arr.append(0)
4     for i, x in enumerate(arr):
5         while stack and arr[stack[-1]] > x:
6             j = stack.pop()
7             k = stack[-1] if stack else -1
8             result += arr[j] * (i - j) * (j - k)
9         stack.append(i)
10    return result % (10**9 + 7)
11
12 # Example
13 print("Sum of Subarray Minimums:", sum_subarray_mins([3, 1, 2, 4]))
14
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.209 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Sum of Subarray Minimums: 17

[Done] exited with code=0 in 0.13 seconds

```

1 def combination_sum(candidates, target):
2     res = []
3
4     def dfs(i, curr, total):
5         if total == target:
6             res.append(curr[:])
7             return
8         if i >= len(candidates) or total > target:
9             return
10        curr.append(candidates[i])
11        dfs(i, curr, total + candidates[i])
12        curr.pop()
13        dfs(i + 1, curr, total)
14
15    dfs(0, [], 0)
16    return res
17
18 # Example
19 print("Combination Sum I:", combination_sum([2, 3, 6, 7], 7))
20 |

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.13 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Combination Sum I: [[2, 2, 3], [7]]

[Done] exited with code=0 in 0.136 seconds


```

1  def combination_sum2(candidates, target):
2      candidates.sort()
3      res = []
4
5      def dfs(i, curr, total):
6          if total == target:
7              res.append(curr[:])
8              return
9          if i >= len(candidates) or total > target:
10             return
11          if i == 0 or candidates[i] != candidates[i - 1] or i == 0:
12              curr.append(candidates[i])
13              dfs(i + 1, curr, total + candidates[i])
14              curr.pop()
15              dfs(i + 1, curr, total)
16
17      dfs(0, [], 0)
18      return res
19
20  # Example
21  print("Combination Sum II:", combination_sum2([10, 1, 2, 7, 6, 1, 5], 8))
22

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.136 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Combination Sum II: []

[Done] exited with code=0 in 0.143 seconds

```
1  from itertools import permutations
2
3  def get_permutations(nums):
4      |   return list(map(list, permutations(nums)))
5
6  # Example
7  print("Permutations:", get_permutations([1, 2, 3]))
8  |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.143 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Permutations: [[1, 2, 3], [1, 3, 2], [2, 1, 3], [2, 3, 1], [3, 1, 2], [3, 2, 1]]

[Done] exited with code=0 in 0.156 seconds

```
1 def unique_permutations(nums):
2     from itertools import permutations
3     return list(map(list, set(permutations(nums))))
4
5 # Example
6 print("Unique Permutations:", unique_permutations([1, 1, 2]))
7
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

[Done] exited with code=0 in 0.156 seconds

[Running] python -u "c:\Users\hp\OneDrive\Desktop\project directory\tempCodeRunnerFile.python"
Unique Permutations: [[1, 2, 1], [2, 1, 1], [1, 1, 2]]

[Done] exited with code=0 in 0.137 seconds

```
1 def solve_sudoku(board):
2     def is_valid(r, c, v):
3         return all(v != board[r][i] for i in range(9)) and \
4             all(v != board[i][c] for i in range(9)) and \
5             all(v != board[3 * (r // 3) + i // 3][3 * (c // 3) + i % 3] for i in range(9))
6
7     def solve():
8         for r in range(9):
9             for c in range(9):
10                 if board[r][c] == '.':
11                     for v in '123456789':
12                         if is_valid(r, c, v):
13                             board[r][c] = v
14                             if solve(): return True
15                             board[r][c] = '.'
16                             return False
17
18     solve()
19     return board
20
21 # Example usage
22 board = [
23     ["5","3",".", ".", ".", "7",".", ".", ".", ".", "."], ["6",".", ".", ".", "1","9","5",".", ".", ".", "."], [".","9","8",".", ".", ".", ".", ".", "6",".", "."], ["8",".", ".", ".", ".", "6",".", ".", ".", "3"],
24     ["4",".", ".", ".", "8",".", ".", "3",".", ".", "1"], ["7",".", ".", ".", "2",".", ".", ".", "6"], [".","6",".", ".", ".", ".", "2","8",".", "."], [".",".", ".", ".", "4","1","9",".", ".", "5"],
25     [".",".", ".", ".", "8",".", ".", "7","9"]
26 ]
27 for row in solve_sudoku(board):
28     print(row)
```

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	PORTS
Code				
['5', '3', '4', '6', '7', '8', '9', '1', '2']				
['6', '7', '2', '1', '9', '5', '3', '4', '8']				
['1', '9', '8', '3', '4', '2', '5', '6', '7']				
['8', '5', '9', '7', '6', '1', '4', '2', '3']				
['4', '2', '6', '8', '5', '3', '7', '9', '1']				
['7', '1', '3', '9', '2', '4', '8', '5', '6']				
['9', '6', '1', '5', '3', '7', '2', '8', '4']				
['2', '8', '7', '4', '1', '9', '6', '3', '5']				