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recursion based top 15 problem commonly asked in interview questions.  
give input and output of the problem.  
list 5 easy, 5 medium, 5 hard difficulty problems.

Sure, here are some common recursion-based problems categorized by difficulty:

Easy


1. Factorial

- Input: `n = 5`
- Output: `120`

2. Fibonacci Sequence



- Input: `n = 4`
- Output: `3` (Fibonacci sequence: 0, 1, 1, 2, 3)

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3. Power of a Number

- Input: `x = 2, n = 3`
- Output: `8` ( $2^3$ )

4. Sum of Natural Numbers

- Input: `n = 4`
- Output: `10` ( $1 + 2 + 3 + 4$ )

5. Reverse a String

- Input: `s = "hello"`
- Output: `"olleh"`

Medium



1. N-Queens Problem

- Input: `n = 4`
- Output: `[ [1, 3, 0, 2], [2, 0, 3, 1] ]` (Solutions are the arrangements of queens on the board)

2. Permutations of a String

- Input: `s = "abc"`
- Output: `["abc", "acb", "bac", "bca", "cab", "cba"]`

3. Combination Sum

- Input: `candidates = [2, 3, 6, 7], target = 7`
- Output: `[[2, 2, 3], [7]]`

4. Generate Parentheses

- Input: `n = 3`
- Output: `["((()))", "(()())", "())()()", "()(())", "()()()"]`



5. Subsets

- Input: `nums = [1, 2, 3]`
- Output: `[[], [1], [2], [1, 2], [3], [1, 3], [2, 3], [1, 2, 3]]`

Hard

1. Word Break

- **Input:** `s = "leetcode", wordDict = ["leet", "code"]`
- **Output:** `true` (Can be segmented into "leet code")

## 2. Palindrome Partitioning

- **Input:** `s = "aab"`
- **Output:** `[["a", "a", "b"], ["aa", "b"]]`

## 3. Sudoku Solver

- **Input:**



```
css Copy code

board = [ ["5","3",".", ".", ".", "7",".", ".", ".", ".", "."],
["6",".", ".", ".", "1","9","5",".", ".", ".", "."],
[".", "9","8",".", ".", ".", ".", "6",".", "."],
["8",".", ".", ".", "6",".", ".", ".", "3"],
["4",".", ".", "8",".", "3",".", ".", "1"],
["7",".", ".", "2",".", ".", ".", "6"],
[".", "6",".", ".", ".", "2",".", "8"],
[".", ".", "4",".", ".", ".", "7"],
[".", ".", "1","9",".", ".", "5"]
]
```

- **Output:** The solved board with all cells filled with numbers 1-9.

## 4. Generate All Unique Permutations

- **Input:** `nums = [1,1,2]`
- **Output:** `[[1,1,2], [1,2,1], [2,1,1]]`

## 5. Combination Sum II



- **Input:** `candidates = [10,1,2,7,6,5], target = 8`
- **Output:** `[[1, 2, 5], [1, 7], [2, 6]]`

These problems span a range of recursion techniques and are frequently asked in technical interviews.



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