22. Generate Parentheses

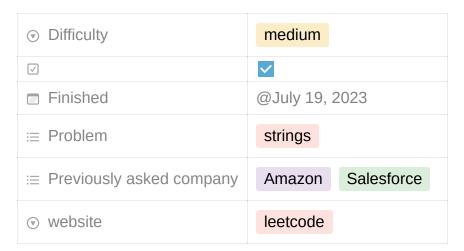|	
⊙ Difficulty	medium
☑	✅
🗓 Finished	@July 19, 2023
☰ Problem	strings
☰ Previously asked company	Amazon Salesforce
⊙ website	leetcode

Question:

Given `n` pairs of parentheses, write a function to *generate all combinations of well-formed parentheses*.

Example 1:

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

Example 2:

```
Input: n = 1
Output: ["()"]
```

Optimal solution:

```python
class Solution(object):
    def generateParenthesis(self, n):
        stack = []
        res = []

        def backtrack(openN, closeN):
            if openN == closeN == n:
                res.append(''.join(stack))
                return

            if openN < n:
                stack.append('(')
                backtrack(openN + 1, closeN)
                stack.pop()

            if closeN < openN:
                stack.append(')')
                backtrack(openN, closeN + 1)
                stack.pop()

        backtrack(0, 0)
        return res
```