Problem 3723: Maximize Sum of Squares of Digits

Problem Information

Difficulty: Medium
Acceptance Rate: 58.75%
Paid Only: No
Tags: Math, Greedy

Problem Description

You are given two **positive** integers `num` and `sum`.

A positive integer `n` is **good** if it satisfies both of the following:

* The number of digits in `n` is **exactly** `num`. * The sum of digits in `n` is **exactly** `sum`.

The **score** of a **good** integer `n` is the sum of the squares of digits in `n`.

Return a **string** denoting the **good** integer `n` that achieves the **maximum** **score**. If there are multiple possible integers, return the **maximum** ■■■■■■■one. If no such integer exists, return an empty string.

Example 1:

Input: num = 2, sum = 3

Output: "30"

Explanation:

There are 3 good integers: 12, 21, and 30.

* The score of 12 is `12 + 22 = 5`. * The score of 21 is `22 + 12 = 5`. * The score of 30 is `32 + 02 = 9`.

The maximum score is 9, which is achieved by the good integer 30. Therefore, the answer is `"30"`.

Example 2:

Input: num = 2, sum = 17

Output: "98"

Explanation:

There are 2 good integers: 89 and 98.

* The score of 89 is `82 + 92 = 145`. * The score of 98 is `92 + 82 = 145`.

The maximum score is 145. The maximum good integer that achieves this score is 98. Therefore, the answer is `"98"`.

Example 3:

Input: num = 1, sum = 10

Output: ""

Explanation:

There are no integers that have exactly 1 digit and whose digits sum to 10. Therefore, the answer is `""`.

Constraints:

* `1 <= num <= 2 * 105` * `1 <= sum <= 2 * 106`

Code Snippets

C++:

```
class Solution {
public:
string maxSumOfSquares(int num, int sum) {

}
};
```

Java:

```
class Solution {
public String maxSumOfSquares(int num, int sum) {

}
}
```

Python3:

```
class Solution:
def maxSumOfSquares(self, num: int, sum: int) -> str:
```