479 Largest Palindrome Product

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Find the largest palindrome made from the product of two n-digit numbers.
Since the result could be very large, you should return the largest palindrome mod 1337.

Example:

Input: 2

Output: 987

Explanation: 99 x 91 = 9009, 9009 % 1337 = 987

Note:

The range of n is [1,8].

来自 <https://leetcode.com/problems/largest-palindrome-product/description/>

你需要找到由两个 n 位数的乘积组成的最大回文数。
由于结果会很大，你只需返回最大回文数 mod 1337得到的结果。

示例:

输入: 2

输出: 987

解释: 99 x 91 = 9009, 9009 % 1337 = 987

说明:

n 的取值范围为 [1,8]。

Solution for Python3:

```python
class Solution:
    def largestPalindrome(self, n):
        """
        :type n: int
        :rtype: int
        """
        import math
        if n == 1:
            return 9
        maxNum = int(math.pow(10, n) - 1)
        minNum = int(math.pow(10, n - 1))
        maxProduct = maxNum * maxNum
        firstHalf = maxProduct // int(math.pow(10, n))
        while True:
            candidate = self.palindrome(firstHalf)
            firstHalf -= 1
            if candidate > maxProduct:
                continue
            for i in range(maxNum, minNum - 1, -1):
                if candidate / i > maxNum:
                    break
                if candidate % i == 0:
                    return candidate % 1337

```

```
26
27        def palindrome(self, firstHalf):
28            s = str(firstHalf) + str(firstHalf)[::-1]
            return int(s)
```

Solution for C++:

```
 1 class Solution {
 2 public:
 3     int largestPalindrome(int n) {
 4         if (n == 1)
 5             return 9;
 6         long long maxNum = stol(to_string(pow(10,n))) - 1;
 7         long long minNum = stol(to_string(pow(10, n - 1)));
 8         long long maxProduct = maxNum * maxNum;
 9         long long firstHalf = maxProduct / stol(to_string(pow(10,
10 n)));
11         while (true) {
12             long candidate = palindrome(firstHalf--);
13             if (candidate > maxProduct)
14                 continue;
15             for (long i = maxNum; i >= minNum; i--) {
16                 if (candidate / i > maxNum)
17                     break;
18                 if (candidate % i == 0)
19                     return int(candidate % 1337);
20             }
21         }
22     }
23
24     long palindrome(long firstHalf) {
25         string s = to_string(firstHalf);
26         reverse(s.begin(), s.end());
27         string str = to_string(firstHalf) + s;
28         return stol(str);
29     }
   };
```