Maths : Video - 26

Leetcode - 3272

Hard

codestorywithmik

CSwithMIK

codestorywithMIK

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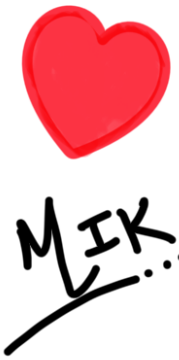
Motivation -

It's not about being smart, it's about not quitting when its boring.

So, while they chill, you build.

One day, they will ask how you did it.



3272. Find the Count of Good Integers

Hard | Topics | Companies | Hint

You are given two **positive** integers `n` and `k`.

An integer `x` is called **k-palindromic** if:

- `x` is a palindrome.
- `x` is divisible by `k`.

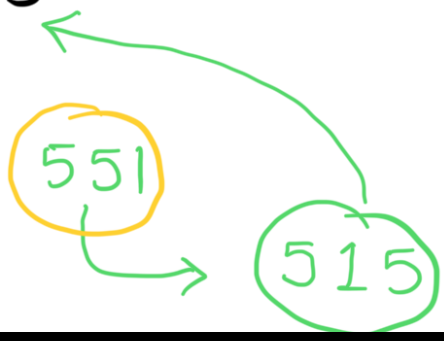
An integer is called **good** if its digits can be *rearranged* to form a **k-palindromic** integer. For example, for `k = 2`, 2020 can be rearranged to form the *k-palindromic* integer 2002, whereas 1010 cannot be rearranged to form a *k-palindromic* integer.

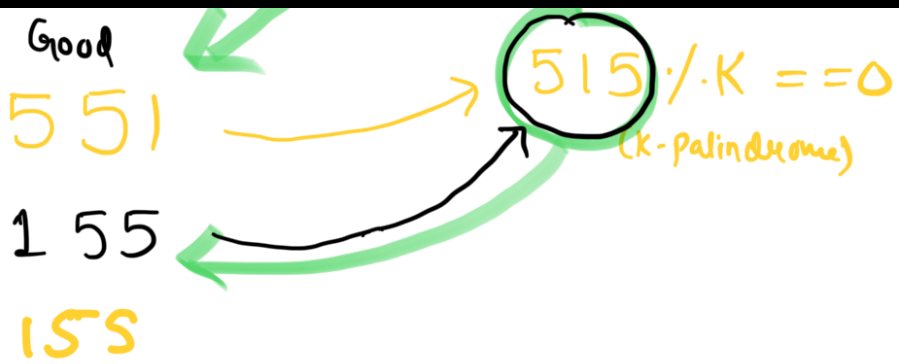
Return the count of **good** integers containing `n` digits.

Note that *any* integer must **not** have leading zeros, **neither** before **nor** after rearrangement. For example, 1010 *cannot* be rearranged to form 101.

Example :- n = 3, K = 5

Output :- 27





Palindrome → Permute
(n-digit) → Good

Thought Process

Let's break it down to baby steps. We solve it from a beginner Point of view.

n digits

n even

n odd

1 2 | 2 1

left Half | Right Half

1 2 (3) | 2 1

Left Half | right Half

$n = 5$

$leftHalf = n/2 = 2$

$leftHalf = (n+1)/2 = (5+1)/2 = 3$

$$leftHalf = (n+1)/2$$

(d)

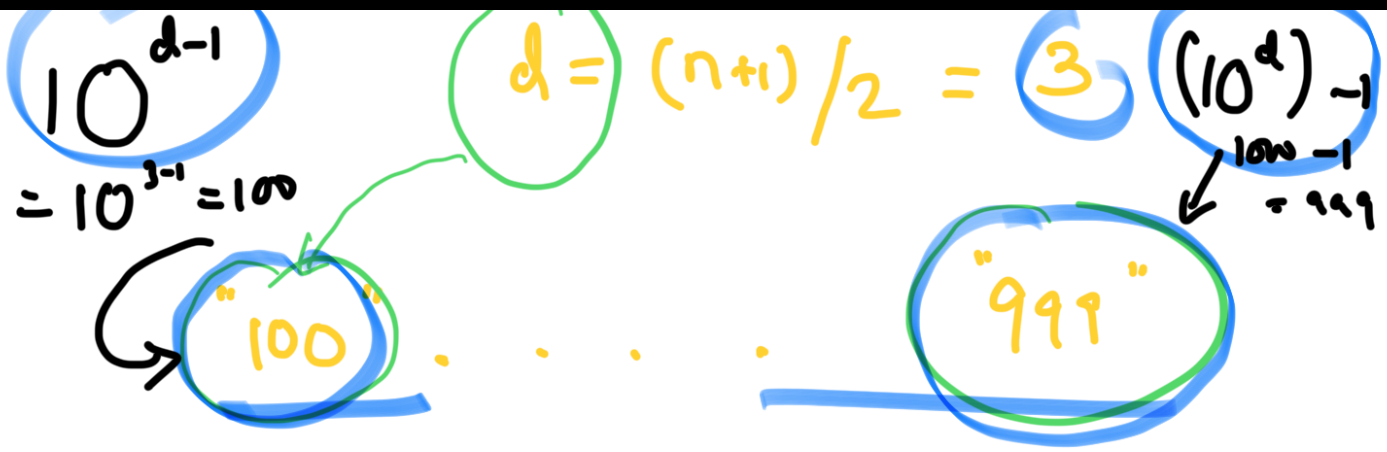
$n = 4$

$d = 2$

[0, 11, 12, ... , 99]

"1221"

$n = 5$



"12321" if (n odd)

"12" → "21"

Pallindromes → Permutation

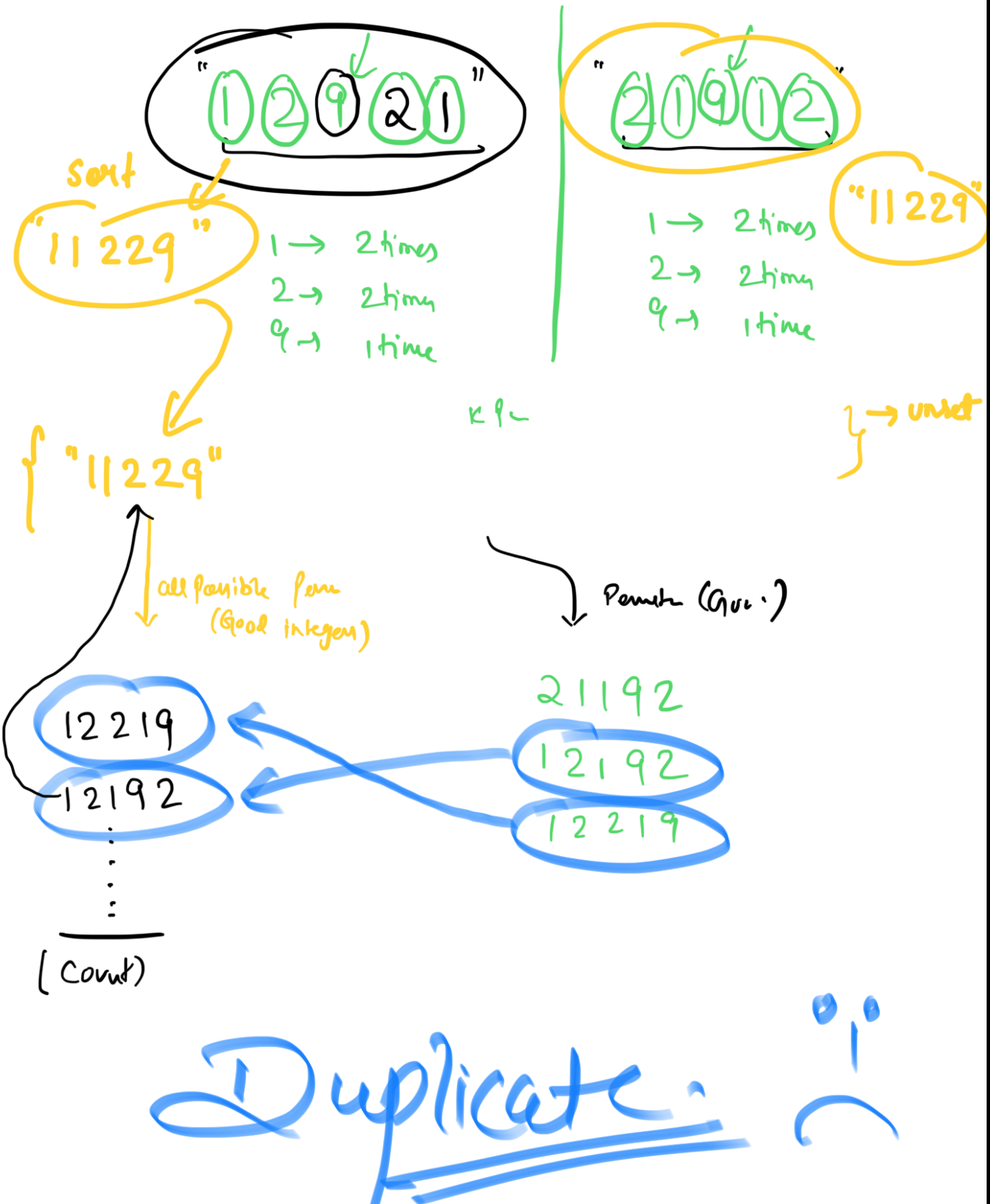
n digit.

Most important Point :-

n = 5 , K = 6

$d = (n+1)/2 = 3$

100 999

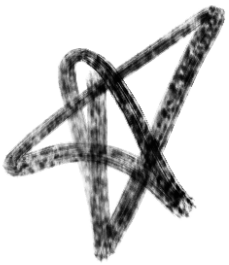


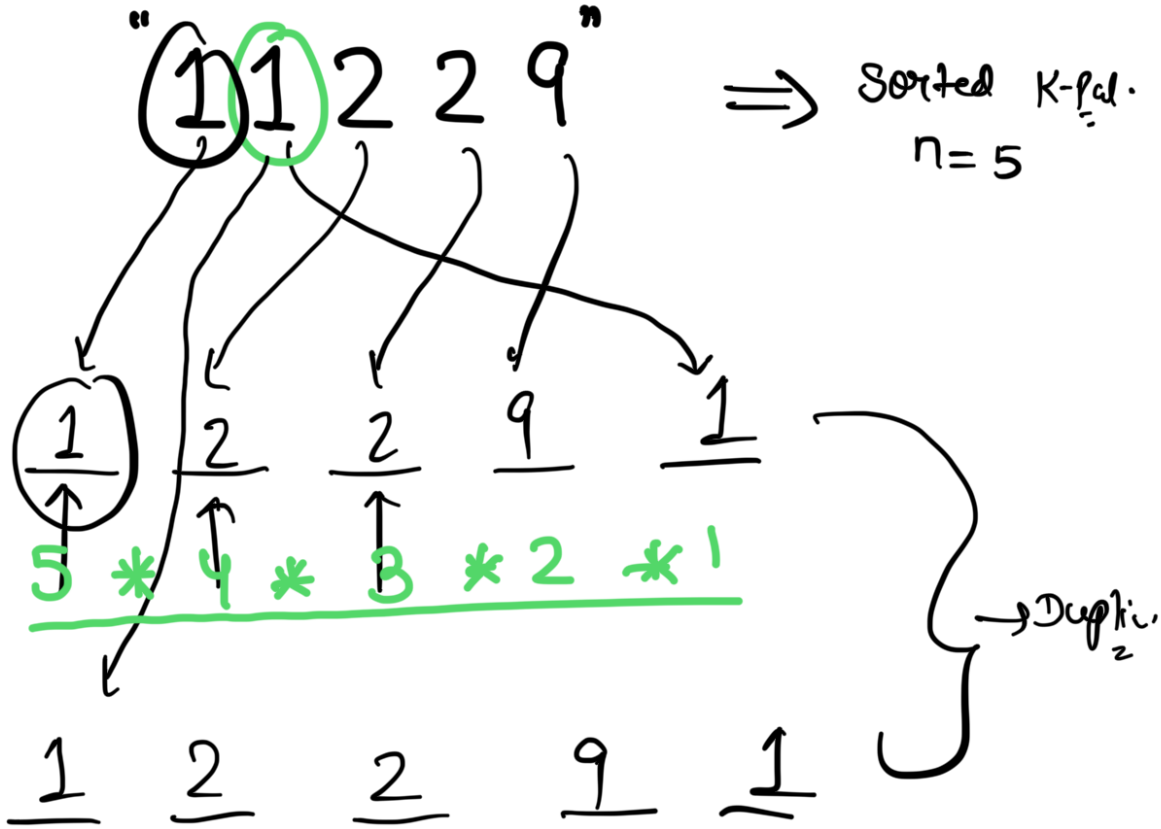
Duplicate :(

(i) Sort our K-Palindrome

(ii) Store in a set.

Now, find all permut of elements in set





Permutations = factorial

But we are getting duplicates.

"AAB"

A → 2
B → 1

AAB
ABA
BAA
BAA
ABA
AAB

3 * 2 * 1 ⇒ 3*2*1 = 3!

$$\frac{3!}{2!\ 1!} = \frac{6}{2*1} = 3$$

AAB, ABA, BAA

Maths.

"11229"

1 → 2
2 → 2
9 → 1

$$\frac{5!}{2! * 2! * 1!} = \frac{5 * 4 * 3 * 2 * 1}{(2*1)(2*1) * 1}$$

leading zeros X

"0011229"

n = 7

zero digits = 2

nonZero = 5

$$\frac{7!}{2!\ 2!\ 2!\ 1!}$$

0 → 2
1 → 2
2 → 2
9 → 1

5 _ _ _ _ _ _

nonZerodigits * $\frac{(n-1)!}{2!\ 2!\ 2!\ 1!}$

+

0