

② → Palindrome number

1 Question -

Given an integer x , return true if x is palindrome integer

2. Examples -

$121 \rightarrow \text{true}$ 121
 $-121 \rightarrow \text{false}$ $\langle 121- \rangle$
 $10 \rightarrow \text{false}$ $\langle 01 \rangle \Rightarrow 1$

follow up → Could you solve it without converting the integer to a string

3. Intuition / Concept -

- convert integer to string
- check if string is palindrome

4. Brute force solution -

$x = 12321 \Rightarrow 5 \text{ digits}$
left right

$x = 12321$
left right

Time complexity = $O(\log_{10} x)$

Space complexity = $O(\log_{10} x)$? we created a string

$x = 99999 \langle \log_{10} x \rangle \text{ spaces} \rightarrow 5$
int → string

5. Optimized solⁿ ? -

Yes, there is.

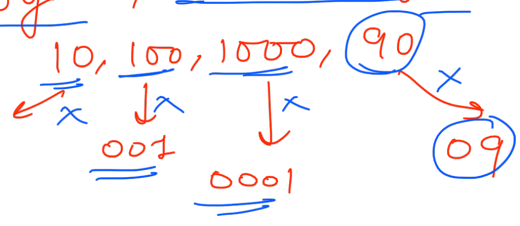
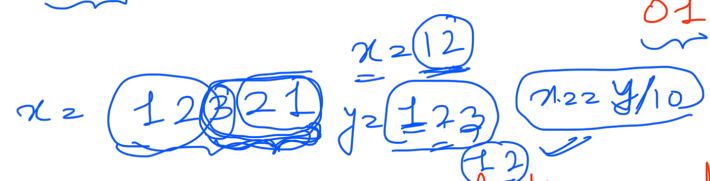
In terms of time, we can't do much.

Space \rightarrow ??

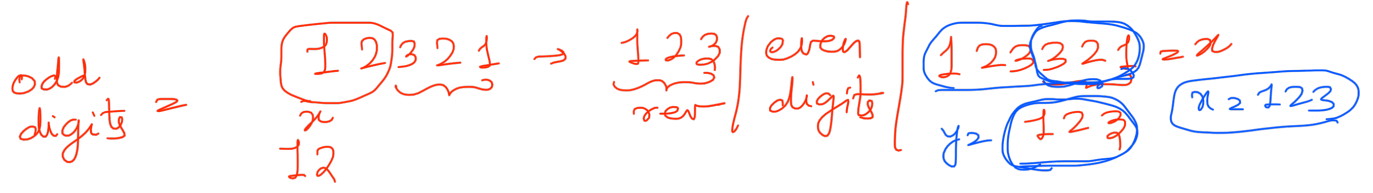
- when number is 0, return true
- when negatives, false
- When number is divisible by 10, return false

1. 0 ✓
2. $-x; y = x$

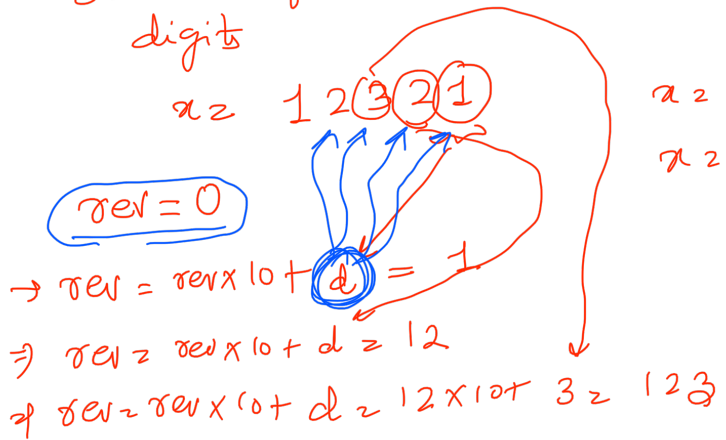
3. 300



- reverse the last half, and compare it with original's first half.



odd no. of digits

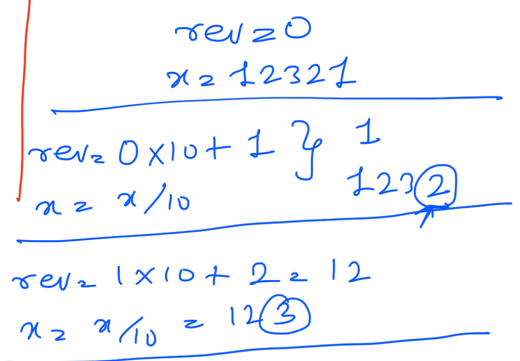


$T = O(\log_{10} x)$
 $S = O(1)$

even -

$rev = rev \times 10 + d$

$x = 12321 > rev$



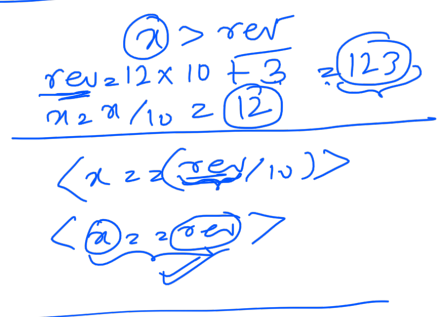
⑥ \rightarrow Time and space Complexity -

Brute force

$T = O(\log_{10} x)$
 $S = O(\log_{10} x)$

Optimized soln

$T = O(\log_{10} x)$
 $S = O(1)$



⑦ → Code walkthrough -

public boolean isPalindrome (int x)

```

    if (x == 0) ✓
        return true
    if x < 0
        return false
    if (x % 10 == 0)
        return false

```

$$x = \frac{-x}{10}$$

90 \neq 09

int rev = 0

while (x > rev)

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    rev = rev * 10 + (x % 10)
    x = x / 10

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return (x == rev) || (x == (rev / 10))

x = 1221

(x = 12) (rev = 12)

x = 12321

(rev = 122)
(x = 12)

x == rev / 10