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Description

Solution

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2166. Design Bitset

Medium

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A **Bitset** is a data structure that compactly stores bits.

Implement the `Bitset` class:

- `Bitset(int size)` Initializes the Bitset with `size` bits, all of which are `0`.
- `void fix(int idx)` Updates the value of the bit at the index `idx` to `1`. If the value was already `1`, no change occurs.
- `void unfix(int idx)` Updates the value of the bit at the index `idx` to `0`. If the value was already `0`, no change occurs.
- `void flip()` Flips the values of each bit in the Bitset. In other words, all bits with value `0` will now have value `1` and vice versa.
- `boolean all()` Checks if the value of **each** bit in the Bitset is `1`. Returns `true` if it satisfies the condition, `false` otherwise.
- `boolean one()` Checks if there is **at least one** bit in the Bitset with value `1`. Returns `true` if it satisfies the condition, `false` otherwise.
- `int count()` Returns the **total number** of bits in the Bitset which have value `1`.
- `String toString()` Returns the current composition of the Bitset. Note that in the resultant string, the character at the i^{th} index should coincide with the value at the i^{th} bit of the Bitset.

Example 1:

Input
["Bitset", "fix", "fix", "flip", "all", "unfix", "flip", "one", "unfix", "count", "toString"]
[[5], [3], [1], [], [], [0], [], [], [0], [], []]

Output
[null, null, null, null, false, null, null, true, null, 2, "01010"]

Explanation

```
Bitset bs = new Bitset(5); // bitset = "00000".
bs.fix(3);    // the value at idx = 3 is updated to 1, so bitset = "00010".
bs.fix(1);    // the value at idx = 1 is updated to 1, so bitset = "01010".
bs.flip();    // the value of each bit is flipped, so bitset = "10101".
bs.all();     // return False, as not all values of the bitset are 1.
bs.unfix(0);  // the value at idx = 0 is updated to 0, so bitset = "00101".
bs.flip();    // the value of each bit is flipped, so bitset = "11010".
bs.one();     // return True, as there is at least 1 index with value 1.
bs.unfix(0);  // the value at idx = 0 is updated to 0, so bitset = "01010".
bs.count();   // return 2, as there are 2 bits with value 1.
bs.toString(); // return "01010", which is the composition of bitset.
```

Constraints:

- $1 \leq \text{size} \leq 10^5$
- $0 \leq \text{idx} \leq \text{size} - 1$
- At most 10^5 calls will be made **in total** to `fix`, `unfix`, `flip`, `all`, `one`, `count`, and `toString`.
- At least one call will be made to `all`, `one`, `count`, or `toString`.
- At most `5` calls will be made to `toString`.

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```
1 class Bitset {
2
3     public Bitset(int size) {
4
5     }
6
7     public void fix(int idx) {
8
9     }
10
11    public void unfix(int idx) {
12
13    }
14
15    public void flip() {
16
17    }
18
19    public boolean all() {
20
21    }
22
23    public boolean one() {
24
25    }
26
27    public int count() {
28
29    }
30
31    public String toString() {
32
33    }
34 }
35
36 /**
37  * Your Bitset object will be instantiated and called as such:
```

Problems

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