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LeetCode – Bulls and Cows (Java)

3-4 minutes

You are playing the following Bulls and Cows game with your friend: You write down a number and ask your friend to guess what the number is. Each time your friend makes a guess, you provide a hint that indicates how many digits in said guess match your secret number exactly in both digit and position (called "bulls") and how many digits match the secret number but locate in the wrong position (called "cows"). Your friend will use successive guesses and hints to eventually derive the secret number.

For example:
Secret number: "1807"
Friend's guess: "7810"

Hint: 1 bull and 3 cows. (The bull is 8, the cows are 0, 1 and 7.)
Write a function to return a hint according to the secret number and friend's guess, use A to indicate the bulls and B to indicate the cows. In the above example, your function should return "1A3B".

Java Solution 1 - Using HashMap

```
public String getHint(String secret, String guess) {
    int countBull=0;
    int countCow=0;
    HashMap<Character, Integer> map = new HashMap<Character, Integer>();

    //check bull
    for(int i=0; i<secret.length(); i++){
        char c1 = secret.charAt(i);
        char c2 = guess.charAt(i);

        if(c1==c2){
            countBull++;
        }else{
            if(map.containsKey(c1)){
                int freq = map.get(c1);
                freq++;
                map.put(c1, freq);
            }else{
                map.put(c1, 1);
            }
        }
    }

    //check cow
    for(int i=0; i<secret.length(); i++){
        char c1 = secret.charAt(i);
        char c2 = guess.charAt(i);

        if(c1!=c2){
            if(map.containsKey(c2)){
                countCow++;
                if(map.get(c2)==1){
                    map.remove(c2);
                }else{
                    int freq = map.get(c2);
                    freq--;
                    map.put(c2, freq);
                }
            }
        }
    }

    return countBull+"A"+countCow+"B";
}
```

Java Solution 2 - Using an Array

Since the secret and guess only contain numbers and there are at most 10 possible digits, we can use two arrays to track the frequency of each digits in secret and guess.

```
public String getHint(String secret, String guess) {
    int countBull=0;
    int countCow =0;
    int[] arr1 = new int[10];
    int[] arr2 = new int[10];

    for(int i=0; i<secret.length(); i++){
        char c1 = secret.charAt(i);
        char c2 = guess.charAt(i);

        if(c1==c2)
            countBull++;
        else{
            arr1[c1-'0']++;
            arr2[c2-'0']++;
        }
    }

    for(int i=0; i<10; i++){
        countCow += Math.min(arr1[i], arr2[i]);
    }

    return countBull+"A"+countCow+"B";
}
```