Count Pair difference :-

You are given an array **A** of **N** integers and an integer **B**.
Count the number of pairs `(i,j)` such that `A[i] - A[j] = B` and `i ≠ j`.

Since the answer can be very large, return the remainder after dividing the count with 10^9+7.

arr[] = 9, 5, 1, 2 (0 1 2 3) , B = 4 . ans = 1

9 → -1 , 7
5 → 1 , 9
1 → 5 , -3
2 → 6 , -2

3 → 1
5 → 1
1 → 1
2 → 1

ans = 1 .

$y - x = B$, $x - y = B$

$y = B + x$, $x - B = y$

$y = x + B$, $y = x - B$

arr[] = 1, 2, 1, 2 , B = 1 ans = 2 x 2 = 4 .

1 → 2 , 0
2 → 3 , 1
1 → 2 , 0
2 → 3 , 1

1 → x 2
2 → 1

```
map <int, int> hmap;
int/long ans = 0;
for (i=0; i<n; i++) {
    ans += hmap[arr[i]+B]
    ans += hmap[arr[i]-B]
    hmap[arr[i]] += 1;
}
return (int)(ans % mod);
```

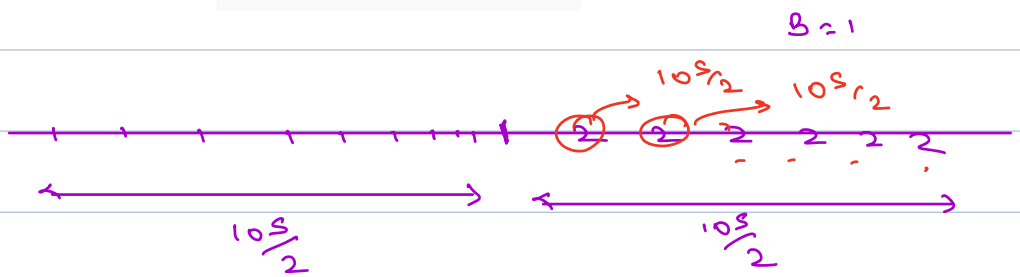
ans = (ans + hmap[arr[i] + B]) % mod

10^9, 10^5

$1 <= N <= 10^5$

$1 <= A[i] <= 10^9$

$1 <= B <= 10^9$



$\left(\frac{10^5}{2} + \frac{10^5}{2} \ldots\right)$

$\Rightarrow \frac{10^5}{2} \times \frac{10^5}{2} \Rightarrow \frac{10^{10}}{4}$.

$2^{31} \rightarrow$

$(2^{10})^3 \Rightarrow 1024 \simeq (1000)^3$

$2^{30} = 10^9$.

$2 \times 2^{31} = 2 * 10^9$

primes & divisibility

One day, a mysterious message arrived at the club's headquarters. The message contained two numbers, **A and B**, and a cryptic challenge. The challenge stated that hidden within the range of numbers from **A** to **B**, there were **special prime numbers** that held the key to unlocking a hidden treasure. Special Prime numbers are the prime numbers that end with **3**.

$1 < A, B, < = 10^5$ | $A = 5$, $B = 30$] → (13, 23).

↓

Sieve => $n \log \log n$

Sieve → Prime no. till B.

```
for (i=A; i<=B; i++){
    if (isPrime[i]==T && i%10==3){
        print(i);
    }
}
```

Ques Recursion Problem

int count = 0;

```
void Func(int sr, int sc, int dr, int dc) {

      if(sr > dr || sc > dc){

          return;

      }

      if(sr == dr && sc == dc){

          count++;

          return;

      }
      print(1)                    pre
      Func(sr, sc + 1, dr, dc);
          print(2)                in
      Func(sr + 1, sc, dr, dc);
 }    print(3)                    post
```

func(0,0,2,2)

1 1 1 2 1 2 3 3 2