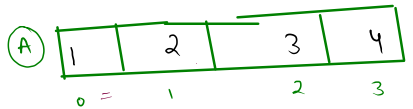
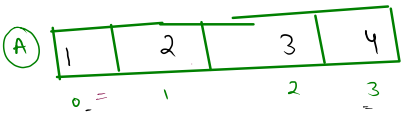
nested loops



1 1 2 2 3 3 4 4
1 2 2 3 3 4
1 3 2 4
1 4

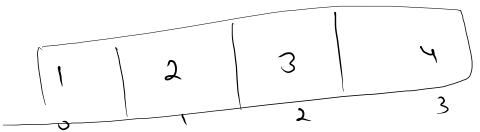
← i → [0 ... n)
j → i ... n



i j
1 1 2 1 3 1 4 1
1 2 2 2 3 2 4 2
1 3 2 3 3 3 4 3
1 4 2 4 3 4 4 4

for (i=0 ⟶ <n)
for (j=0 ... <n)

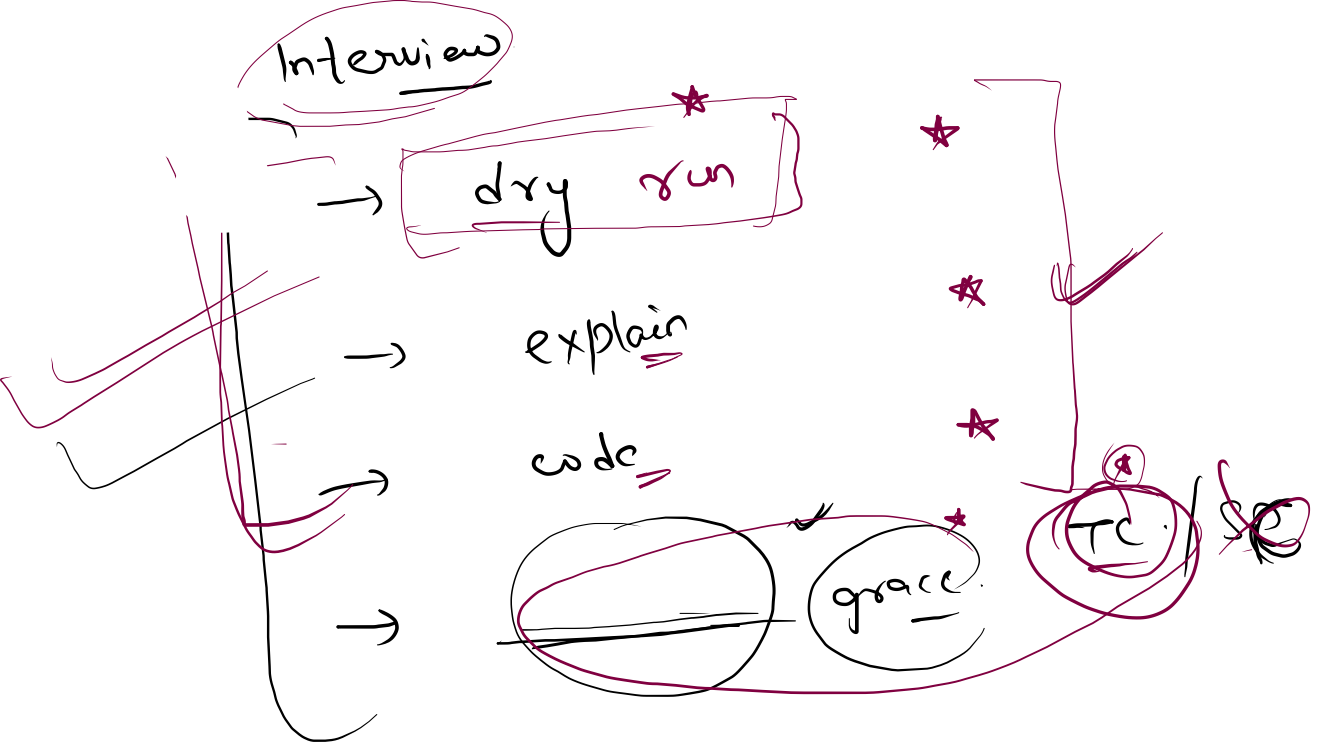
n=4



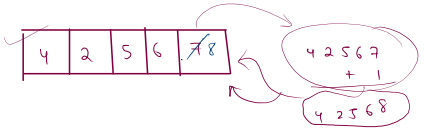
i=n-2

1 2 1 3 2 4 3
2 3 2 4 3
3 4 3

for(i=0 ... <n-1)
{ for(j= i+1 ... <n)
}
}

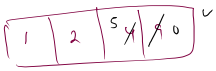

Interview
dry run
explain
code
TC
SC
grace

Add One



42569
+ 1
42568

1



1250

1000

4 2 5 67

1 2 5 9

1000

9 digit → int

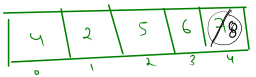
16 digit → long

int / long.

4 2 5 6 7

+ 1

4 2 5 6 8



A[i] = 0

carry = 1 0

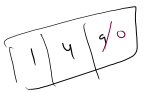
val = A[i] + carry

val == 10

0 1 2 3 4

0 .... 9 +1

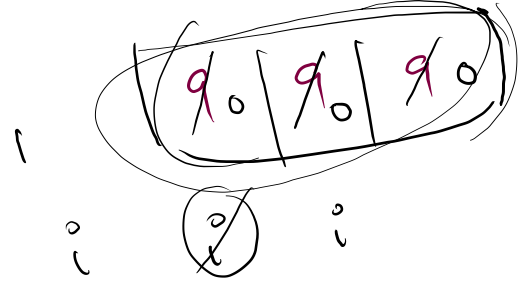
else



carry = 1

val = A[i] + carry.

= 10

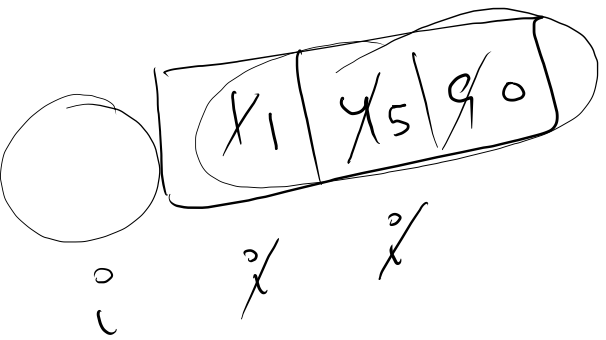


C = 1

v = A[i] + C

v = 10

v = 10



C = 0

v = A[i] + C

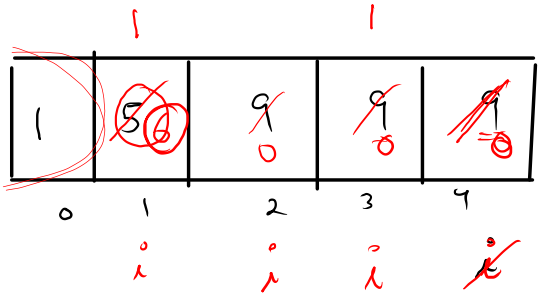
v = 10

= 5

v = 1 + 0 = 1

```
int carry = 1;

for(int i = n-1; i >= 0; i--){
    int val = carry + A[i];

    if(val == 10){
        A[i] = 0;
    }
    else{
        A[i] = val;
        carry = 0;
        break;
    }
}
```

n = 5



C = 1 C

9 + 1 = 10

V = 10

V = 1 + 9 = 10

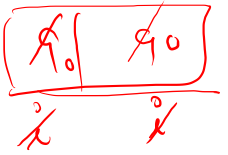
V = 10

V = 5 + 1 = 6

1600

```
int carry = 1;

for(int i = n-1; i >= 0; i--){
    int val = carry + A[i];

    if(val == 10){
        A[i] = 0;
    }
    else{
        A[i] = val;
        carry = 0;
        break;
    }
}
```

C = 1



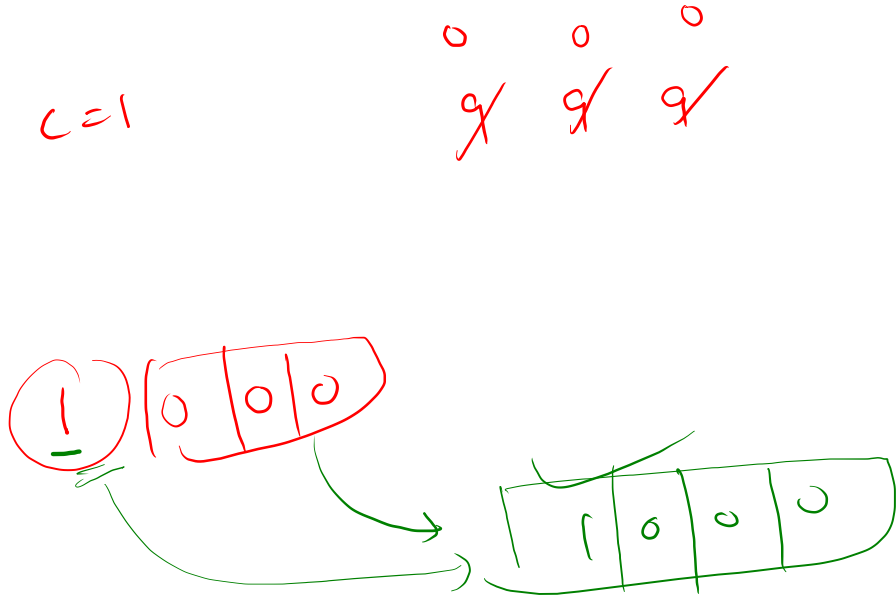
V = 1 + 9 = 10

V = 1 + 9 = 10

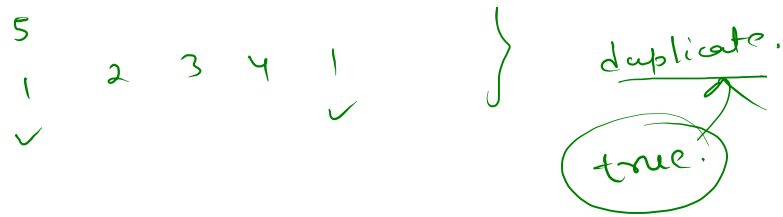
✓

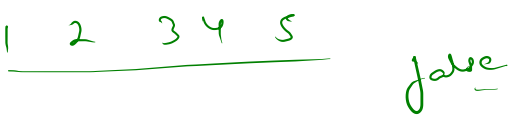
100

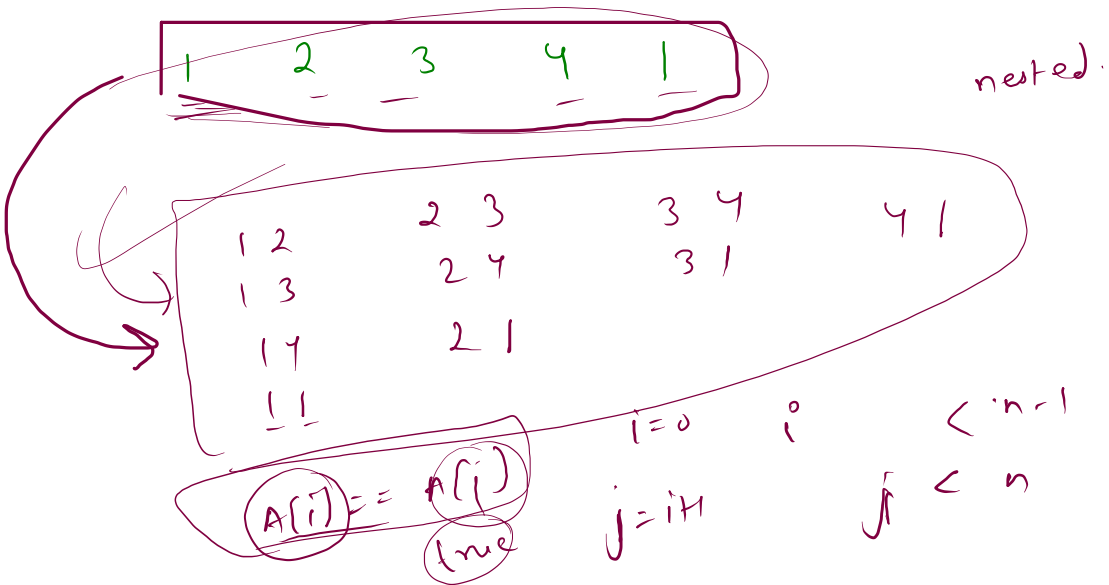
```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    int [] A = new int[n];
    for(int i = 0; i < n; i++){
        A[i] = scn.nextInt();
    }

    int carry = 1;

    for(int i = n-1; i >= 0; i--){
        int val = carry + A[i];

        if(val == 10){
            A[i] = 0;
        }
        else{
            A[i] = val;
            carry = 0;
            break;
        }
    }

    if(carry > 0){
        System.out.print(carry + " ");
    }

    for(int i = 0; i < n; i++){
        System.out.print(A[i] + " ");
    }

}
```

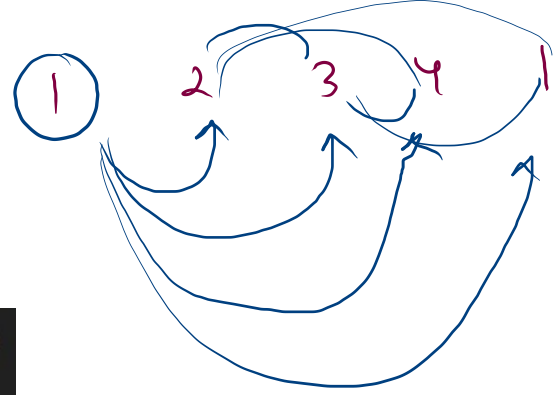


Find Duplicate 3










```
boolean ans = false;          //ans->
for(int i = 0 ; i < n-1; i++){
    for(int j = i + 1; j < n; j++){
        if(A[i] == A[j]){
            ans = true;
            break;
        }
    }
}
```

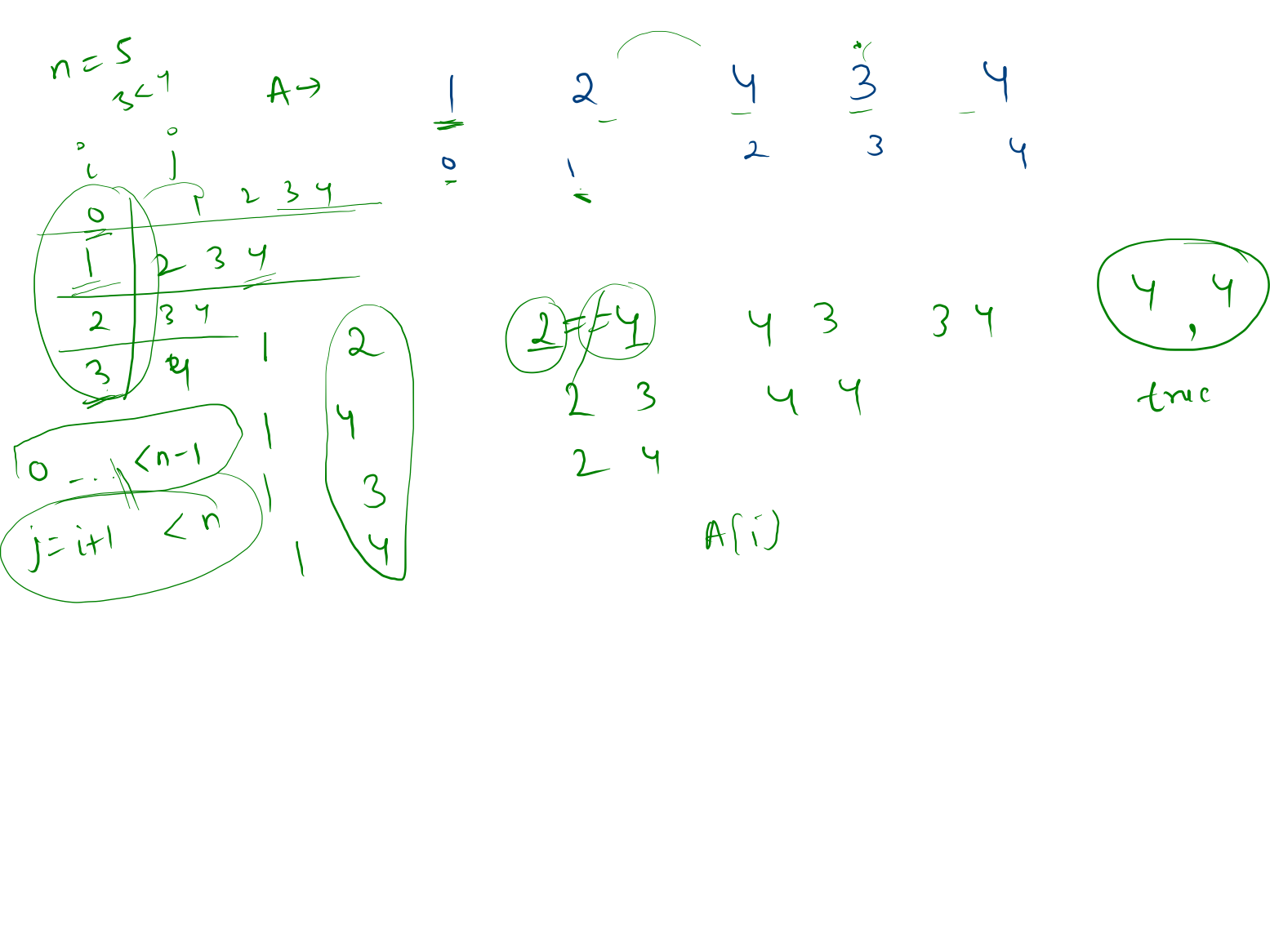
Syso(A(i) + " " + A(j));

1 2
1 3
1 4
1 1

1 == 2

2 3
2 4
2 1
3 4
3 1
4 1

```java
public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int n = scn.nextInt();
    int [] A = new int[n];
    for(int i = 0; i < n; i++){
        A[i] = scn.nextInt();
    }

    boolean ans = false;        //ans-> false no duplicate | ans -> true : duplicates
    for(int i = 0 ; i < n-1; i++){
        for(int j = i + 1; j < n; j++){
            if(A[i] == A[j]){
                ans = true;
            }
        }

    }
    System.out.println(ans);


}
```


n=5
A→
1 2 4 3 4
2 3 4
3 4
4
0 ... <n-1
j=i+1 < n
2 4 3 4
2 3 4 4
2 4
A[i]
4 , 4
true

```java
public class Solution {

    public static boolean solve(int [] A){
        int n = A.length;
        for(int i = 0 ; i < n-1; i++){
            for(int j = i + 1; j < n; j++){
                if(A[i] == A[j]){
                    return true;
                }
            }

        }

        return false;
    }

    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
        int n = scn.nextInt();
        int [] A = new int[n];
        for(int i = 0; i < n; i++){
            A[i] = scn.nextInt();
        }

        boolean ans = solve(A);         //ans-> false no duplic

        System.out.println(ans);


    }
}
```

maximum difference between the two elements

Sample Input 0

```
7
2 3 10 6 4 8 1
```

Sample Output 0

```
8
```