Find Missing And Duplicate Number In An Array

(Algorithm)

1. **Find missing and Duplicate Number in an Array.**

(map)

↓

(mathematically)

Ideal string

a + b + c + d + e

Given string

a + e + c + d + e

O/P

b

e

1st step ⇒ a + e + c + d + e − (a + b + c + d + e)

= b − e — (i)

= $b^2 - e^2$ — (ii)

(i) / (ii)

$b^2 - e^2 = \frac{(b+e)(b-e)}{(b-e)} = (b+e)$

Constant = b + e

Const = b − e

b = (Const + Const) / 2

the e ✓

Given an,

arr of element 1 to N

	0	1	2	3	4
arr =	3	2	1	5	1

↓ Processing. (Swap sort)

	0	1	2	3	4
arr =	1	2	3	1	5

↓ iterate

missing = i+1

duplicate = arr[i].

TC ⇒ O(n)
SC ⇒ O(1)

Swap Sort

Swap sort Algo (precisely stage)

```
int i = 0;

while( i < arr.size())
{

    if( arr[i] != arr(arr[i]-1) )
            swap (arr[i], arr[arr[i]-1]);

    else
        i++;
}
```

finding missing and duplicate numbers

```
for( int i=0;  i< arr.size(); i++ )
{

    if ( i != arr[i]+1)
    {
        missing = i+1;
        duplicate = arr[i];
    }

}
```