Assignment - 5

① **Quick Sort :**

case - 1 : Pivot at beg:

flow chart

A
Pivot = a[0]
left = 0
right = n-1

B
if left < right

True   False

if a[i] >= p.

True   False

right = right - 1

True

left != right

True

a[left] = a[right]
left = left + 1

false

a[left] < pivot

True

left = l+1

a[left] = pivot

False

false

if (left < right)

True

a[right] = a
right = n-1

False
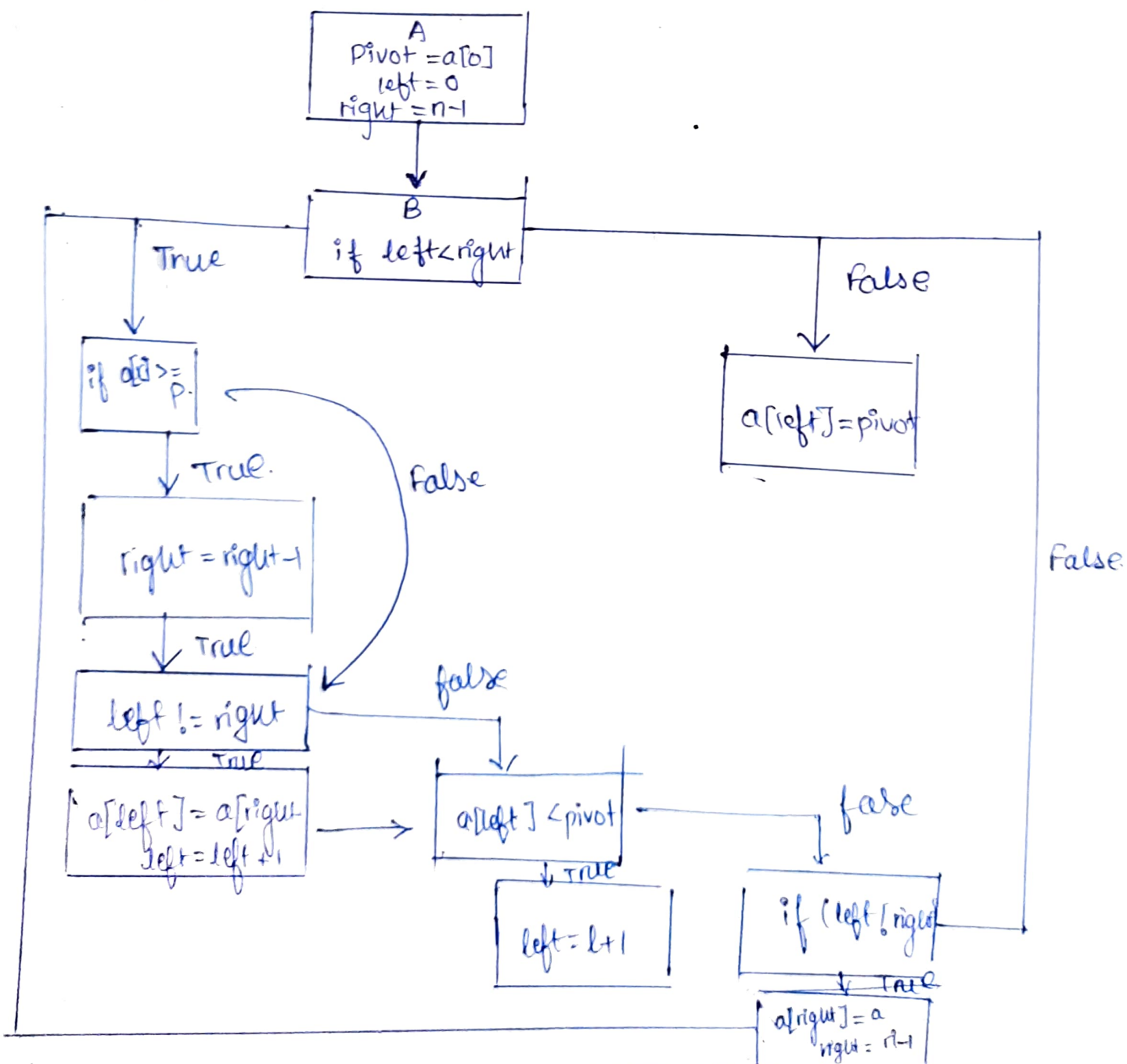
flow Graph of quick sort:

if (left < right)

n_2

if (left >= right)
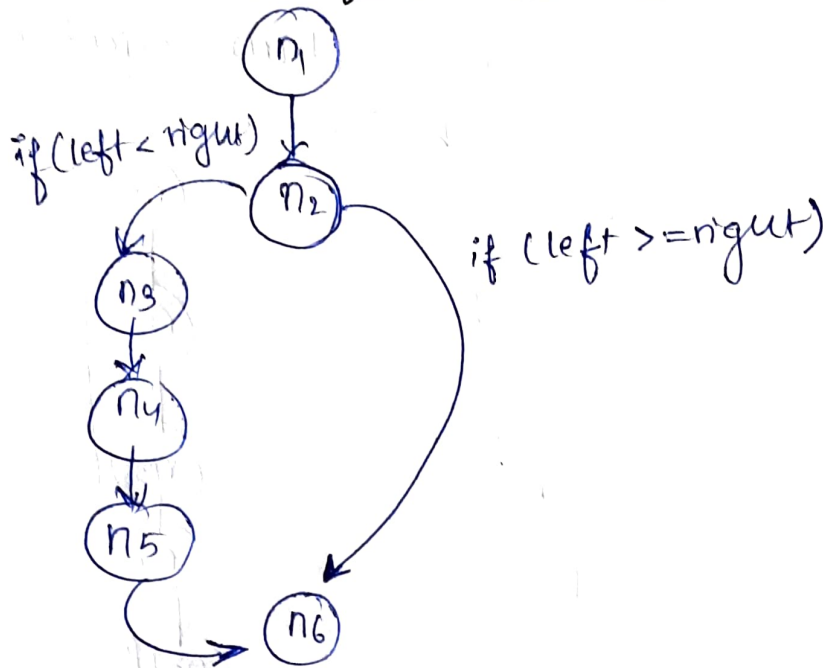
(ii) pivot at middle:

flowchart

$$A$$
$$pivot = a \left[\frac{right + left}{2} \right]$$
int left1 = left -1
int right1 = right+1

I

true

a [++left] < pivot

False

a [--right] > pivot

false

left >= rigth

True   false

quickSort (a[left], a[right])

swap (a[left], a[right])

quick sort (right+1, right)
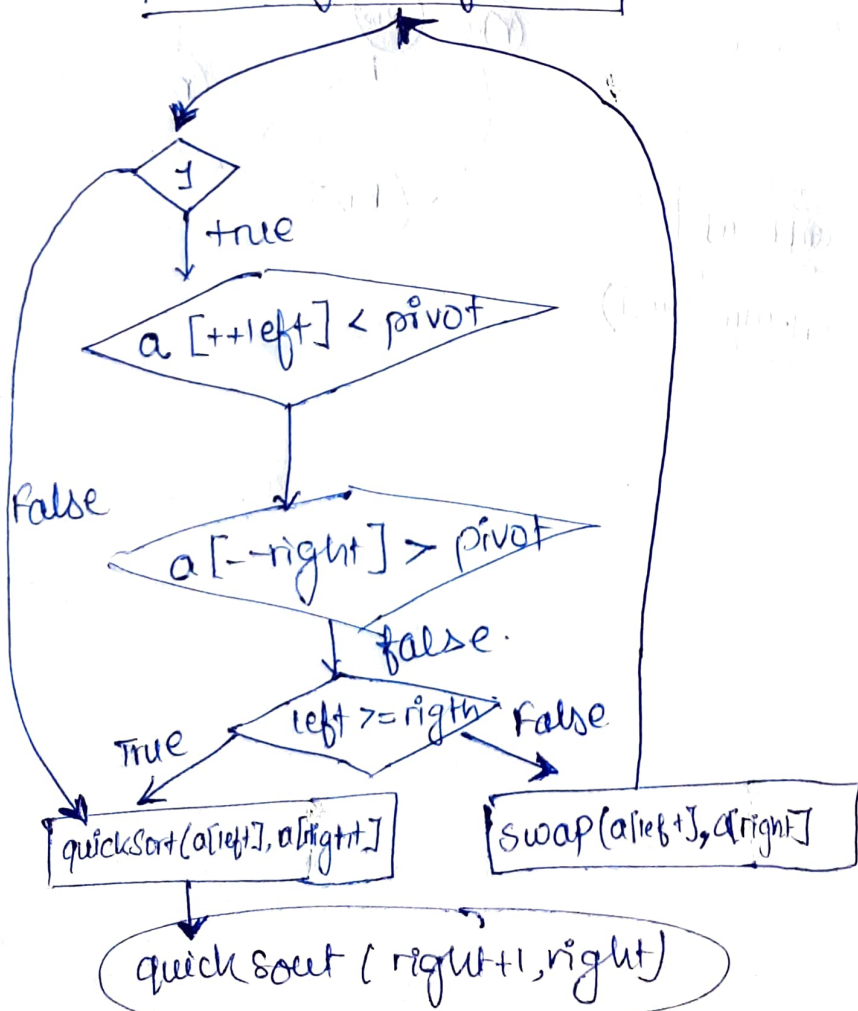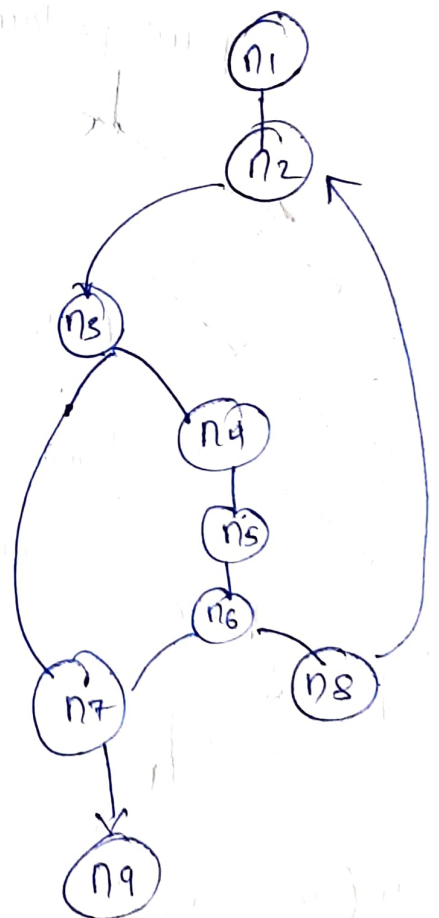
flow graph

(iii) pivot at end :

flow chart

quicksort
Start

law < high

True

pivot = arr
high

int i = (low-1)

int j = law

j <= high-1

True

arr[j] < p

True   False

i++

j++

swap (arr[i], arr[j])

False

swap (arr[i], arr[high])

quicksort (arr, law, i)

quicksort (arr, i+2, high)

flow graph

n_1

n_2

n_3

n_4

n_5

n_6

n_7 n_8

n_9 n_{10} n_{11}

n_{12} n_{13}
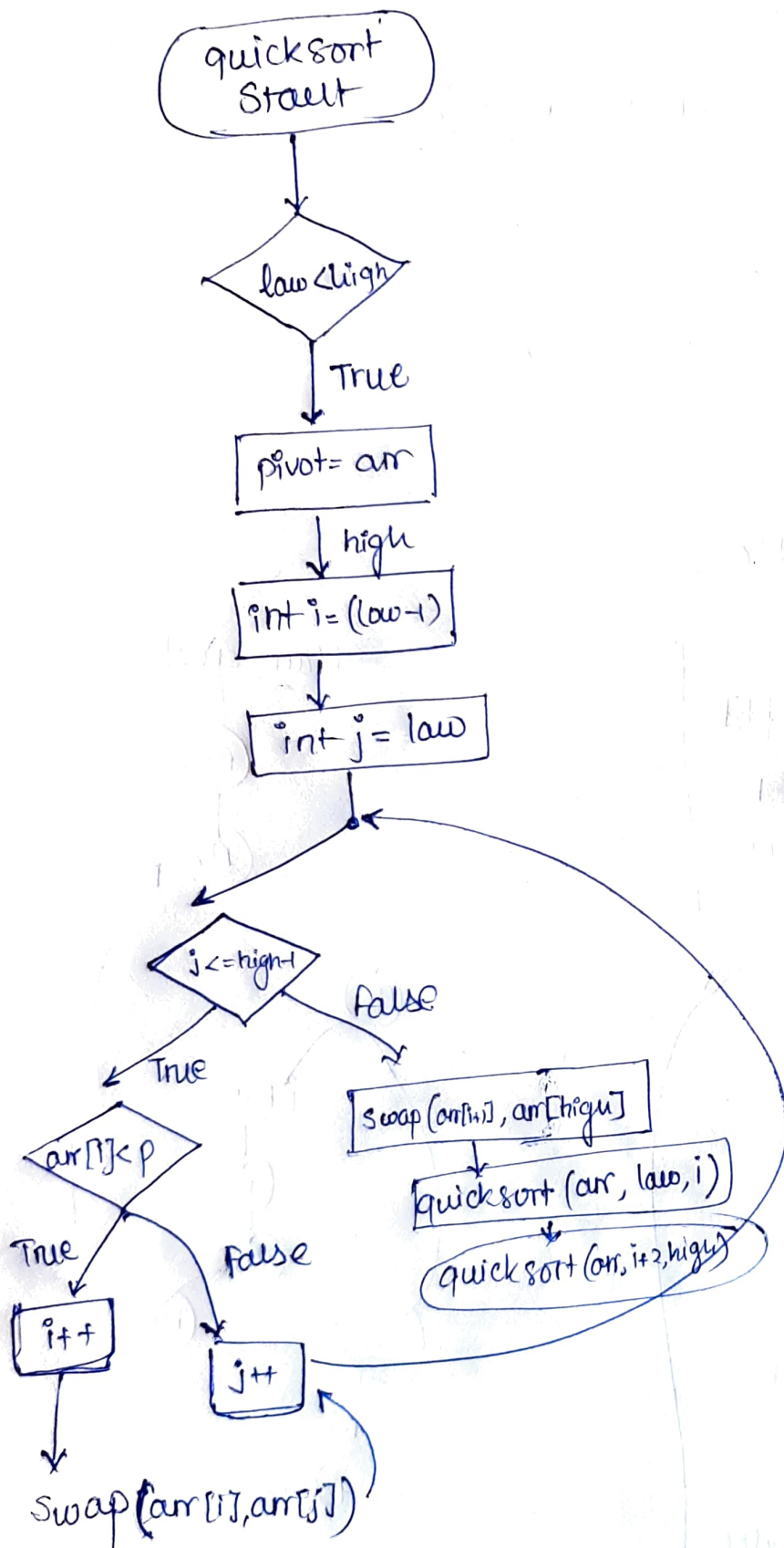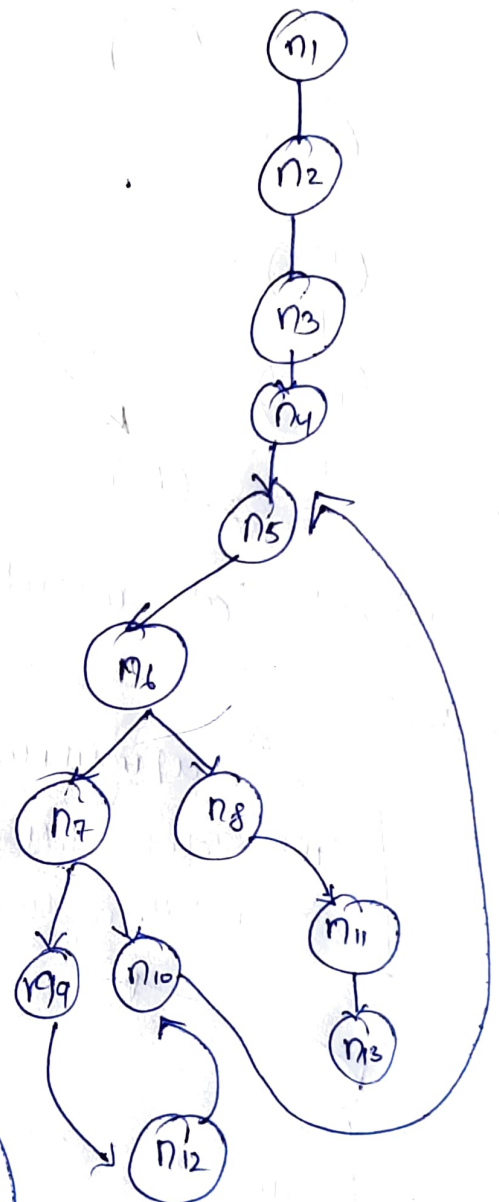
design Test Case :

test case #		values	output
Pivot at begning			
1.	pivot = 4	4,6,8,9,10,12.	4,6,8,9,10,12
2.	pivot = 8	8,4,6,10,9,12	8,6,8,9,10,12
3.	pivot = 12	12,10,9,8,6,4	4,6,8,9,10,12
pivot at mid			
4.	pivot = 8	4,6,8,9,10,12	4,6,8,9,10,12
5.	pivot = 6	8,4,6,10,9,12	4,6,8,9,10,12
6.	pivot = 9	12,10,9,8,6,4	4,6,8,9,10,12
pivot at end			
7.	pivot = 12	4,6,8,9,10,12	4,6,8,9,10,12
8.	pivot = 12	8,4,6,10,9,12	4,6,8,9,10,12
9.	pivot = 4	12,10,9,8,6,4	4,6,8,9,10,12

designing Error Code :

Error #	Error Description	Name of Error
1.	missing values in the array entered.	segmentation fault.
2.	more values than the size of array	segmentation fault.

② Binary Search

①

```
              ( start )
                 │
                 ▼
        / Integer.            /
       / array as input of size 10 ie a[10] /
                 │
                 ▼
          < check
            wheather the array
            is sorted  i.e a[i] < a[i+1] >
                 │
                 ▼
        / Enter  the  element  /
       / to searched (n)       /
                 │
                 ▼
          ┌─────────────┐
          │ start = 0   │
          │ end = n-1   │
          └─────────────┘
                 │
                 ▼
          < start <= end >
                 │
                 ▼
          ┌──────────────────────┐
          │ mid = (start + end)/2 │
          └──────────────────────┘
                 │
                 ▼
          < if a[mid] == n >
                 │
                 ▼
          < if a[mid] < n >  ──→  ┌──────────────┐
                 │                │ start = mid+1 │
                 ▼                └──────────────┘
   ┌──────────────┐
   │ Last = mid-1 │
   └──────────────┘
```

NO

/ target
  not found /

/ Target
  value found /

(stop.)

② flow Graph
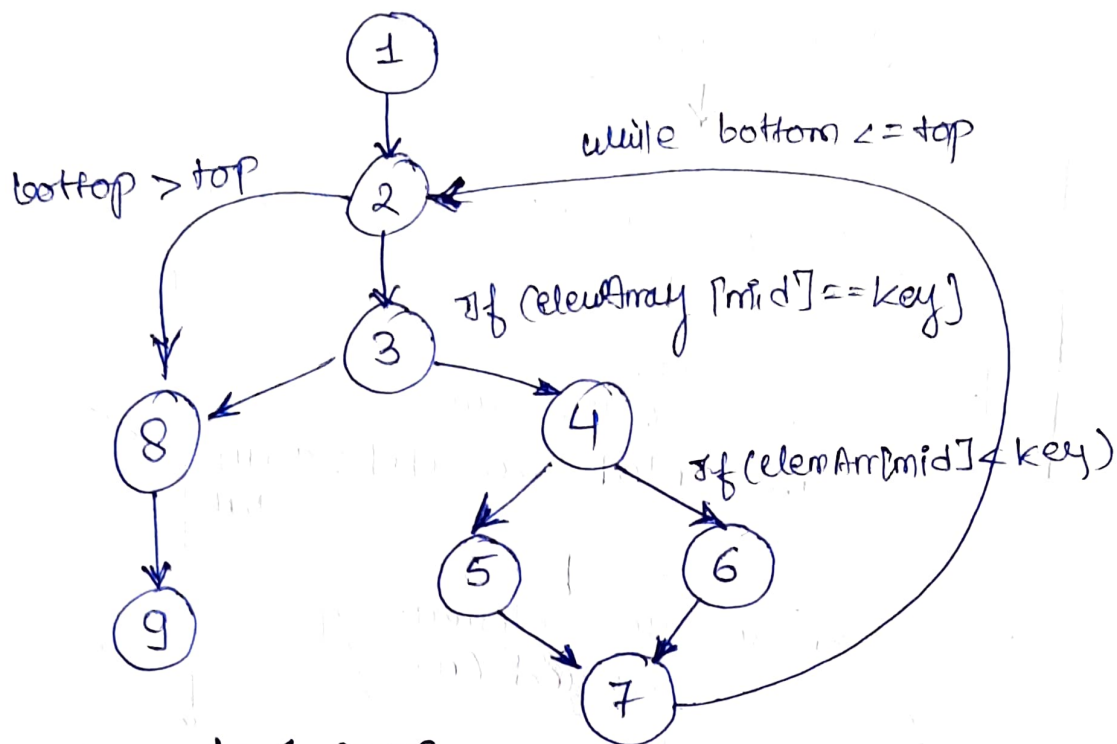
③ Designing test case

Test case #	Ip-Test	key.	Expected Response (found, L)
single value.			
1.	17	17	true, 1
2.	17	0	false, ??
multiple value			
3.	17, 29, 21, 23	17	true, 1
4.	41, 18, 9, 31, 30, 16, 45	45	true, 7
5.	17, 18, 21, 23, 29, 41, 38	23	true, 4
6.	21, 23, 29, 33, 38	25	false, ??

④ Design Error Code

Error #	Error Description	Name of form
1.	Array is not sorted	element may or may not found.
2.	missing values in array	
3.	size of array node	