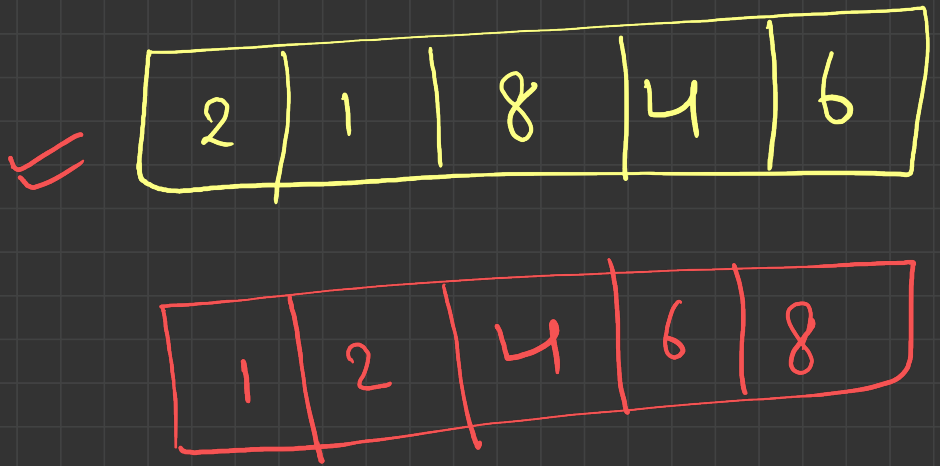
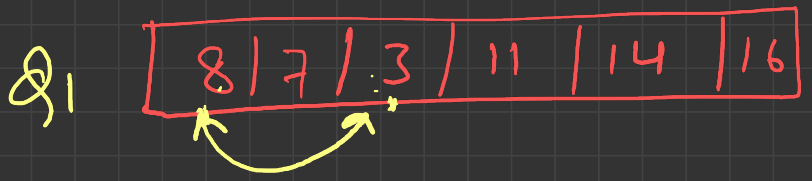
Sorting

Selection Sort

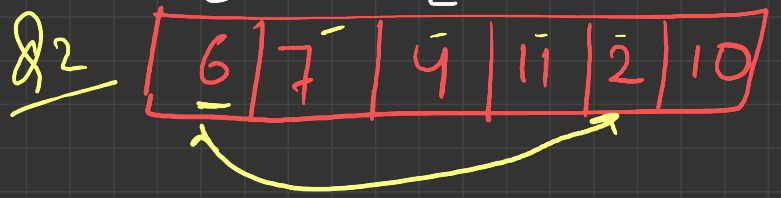


→ Ascending

Descending



1 2 3 4 5 6 = n
0 1 2 3 4 5



R4 2 4 6 7 11 10

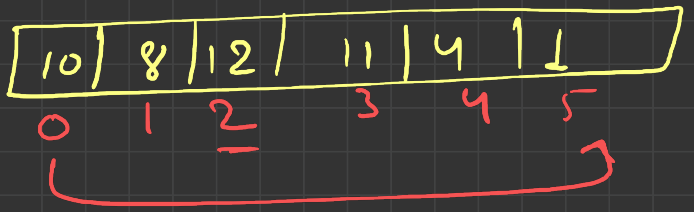
2 7 4 11 6 10 R1 R5 2 4 6 7 10 11

2 4 7 11 6 10 R2

2 4 6 11 7 10 R3

n-1 Round

```
index = 0                    i
for (i=1; i <= n ; i++) {
    if (arr[i] < arr[index]) {
        index = i
```



(0-5)

(1-5)

(2-5)

(3-5)

(4-5)

n-1

1 8 12 11 4 10 — R-1

1 4 12 11 8 10 — R-2

1 4 8 11 12 10 — R-3

1 4 8 10 12 11 — R-4

1 4 8 10 11 12 — R-5

```
for (i = 0 ; i < n-1 ; i++) {
    index = i
    for ( j = i+1 ; j<n ; j++) {
        if (arr[j] < arr[index] ){
            index = j ;
        }
    Swap (arr[index] , arr[i])
    }}
```

{int i, j, index, arr[1000]}

Space

Auxiliary

O(1)

Total space

1 + n

O(n)

$i = 0$ $\quad$ $i = 1$ $\quad$ - - -

$j = 1$ to n $\quad$ $j = 2$ to n

$n-1$ $\quad$ $n-2$

worst $\rightarrow$ $O(n^2)$

$n-1 + n-2 + \cdots$ $\quad$ Best $\rightarrow$ $\Omega(n^2)$

$n-1$ to n $\quad$ Avg $\rightarrow$ $\Theta(n^2)$

$\frac{n(n-1)}{2} = n^2 - n$