

Sorting

Selection Sort

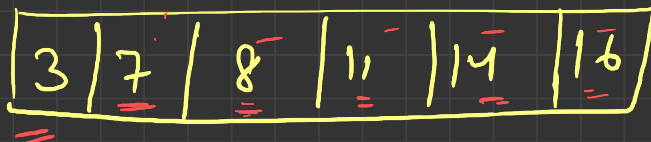
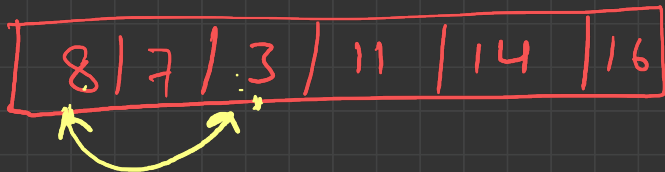
✓

2	1	8	4	6
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→ Ascending
Descending

1	2	4	6	8
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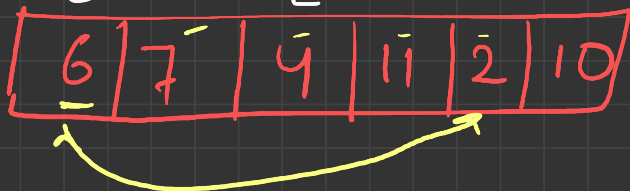
Q1



R-1

$\begin{matrix} & 2 & 3 & 4 & 5 & 6=n \\ 0 & 1 & 2 & 3 & 4 & 5 \end{matrix}$

Q2



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

10	8	12	11	4	1	1
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0 1 2 3 4 5

2

Red arrow from index 0 to index 5.

(0-5)

1 8 12 11 4 10

R-1

(1-5)

1 4 12 11 8 10

R-2

(2-5)

1 4 8 11 12 10

Red arrow from index 2 to index 4.

R-3

(3-5)

1 4 8 10 12 11

R-4

(4-5)

1 4 8 10 11 12

R-5

n-1

```
for (i = 0 ; i < n - 1 ; i++) {
```

index = i

```
for ( j = i + 1 ; j < n ; j++) {
```

{ int i, j
char a
arr[2000] }

```
if (arr[j] < arr[index]) {  
    index = j;  
}
```

```
swap(arr[index], arr[j])  
}
```

Space
Auxiliary

$O(1)$

Total space

$1 + n$

$O(n)$

$$i = 0$$

$$j = 1 \text{ to } n$$

$$n-1$$

$$i = 1$$

$$j = 2 \text{ to } n$$

$$n-2$$

- - -

$$\text{worst} \rightarrow O(\underline{n^2})$$

$$n-1 + n-2 + \dots \quad \text{Best} \rightarrow \Omega(n^2)$$

$$\begin{array}{c} n-1 \text{ to } n \\ \hline \frac{n(n-1)}{2} = n^2 - n \end{array} \quad \text{Avg} \rightarrow \Theta(n^2)$$

