

Q.4

arr \rightarrow { 3, 5, 1, 6, 0 }

bubble sort
decreasing order

3	5	1	6	0
0	1	2	3	4

$i = 0$, $0 < 4$ ✓

$j = 0$, $0 < 4 - 1 - 0 = 3$

if (arr[0] < arr[1]) ✓
3 5

5	3	1	6	0
0	1	2	3	4

$j = 1$, $1 < 3$

if (arr[1] < arr[2])
3 1 ✗

$j = 2$, $2 < 3$

if (arr[2] < arr[3]) ✓
1 6

5	3	6	1	0
0	1	2	3	4

$i = 1$, $1 < 4$

$j = 0$, $0 < 4 - 1 - 1 = 2$

if (arr[0] < arr[1])
5 3 ✗

$j = 1$, $1 < 2$

if (arr[1] < arr[2]) ✓
3 6

swap (3, 6)

5	6	3	1	0
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Pass-1

Pass-2

$i=2$

$2 < 4$

5	6	3	1	0
0	1	2	3	4

$J=0, \quad 0 < 4-1-2 = 0 < 1$

if ($\text{arr}[0] < \text{arr}[1]$)
5 6 ✓

Swap(5, 6)

6	5	3	1	0
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Pass - 3
2

$i=3$

$3 < 4$

$J=0, \quad 0 < 4-1-3 = 0 < 4-4 = 0 < 0$

- 3 passes are required to sort the array in decreasing order.

Q-5

3	5	1	6	0
0	1	2	3	4

→ selection sort ~~array~~
descending order

$i = 0, 0 < 4$

$min = 0$

$j = 1, 1 \leq 4$

while ($1 > 0$ & & $arr[1] > arr[0]$) ✓
5 3

Swap (~~5, 3~~) $min = 1$;

5	3	1	6	0
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if ($1 \neq 0$) {

$j = 2, 2 \leq 4$ Swap ($1, 0$)
 $arr[1], arr[0]$

5	3	1	6	0
0	1	2	3	4

$j = 2, 2 \leq 4$

while ($2 > 0$ & & $arr[2] > arr[1]$)
✓ 1 5 x

$j = 3, 3 \leq 4$

while ($3 > 0$ & & $arr[3] > arr[1]$)
6 5 ✓

$min = 3$

if ($3 \neq 0$)

{ swap ($arr[j], arr[0]$)

6	3	1	5	0
0	1	2	3	4

$j = 4, 4 \leq 4$

while ($4 > 0$ & & $arr[4] > arr[1]$)
0 3 4 =

Pass-1
→

$$\min = 1$$
$$J = 2, \quad 2L = 4$$

while(2 > 0 && arr[2] > arr[1])

$$J_2^3, \quad 3L=4$$

while (320 <+ arr[₅3] > arr[₁2]) ✓

$$\min = 3.$$
$$if(3 != 1)$$

2 swap(3, 4) swap(arr[3], arr[1])

6	5	1	3	0
0	1	2	3	4

$$1 = 2, \quad 2 \angle 4$$
$$\min = 2 \checkmark$$
$$J = 3, \quad 3L = 4$$

if ~~not~~ $(3 \geq 0 \text{ \& \& } \text{arr}[3] > \text{arr}[2])$

~~min~~^{max} $\&$ min = 3

$$1f(3) = 2 \quad \text{L}$$

Swap (arr[3], arr[2])
3 1

6	5	3	1	0
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Part-2

Par-3

$$i=3, \quad 3 < 4$$

$$\min = 3$$

0	5	3	1	0
0	1	2	3	4

$$j=4, \quad 4 < 4$$

$$(4 > 0 \quad \text{arr}[4] > \text{arr}[3])$$

0	5	3	1	0
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→ 3 iterations are required