


Selection Sort

arr [] =

1	7	9	2	3	0
---	---	---	---	---	---

sort
sorted array →

0	1	2	3	7	9
---	---	---	---	---	---

in c order
↳ sorted

what → ?

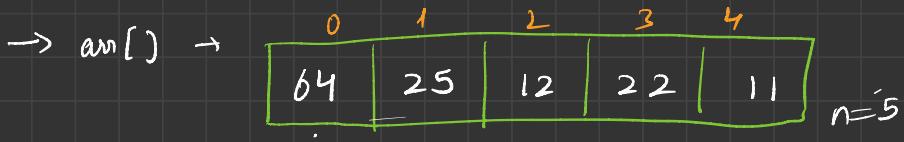
what - ?

Selection sort

→ different Rounds / passes

→ smallest element

laake, usko right
jagah pr place kroche
hai



Round 1 :-

64 \leftarrow 25 12 22 $\underline{11}$

$i=0$

Round 2 :-

11 25 \leftarrow 12 22 64

$i=1$

Round 3 :-

11 12 25 \leftarrow 22 64

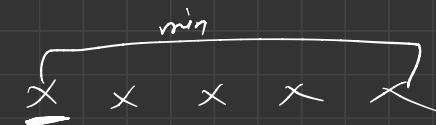
$i=2$

Round 4 :-

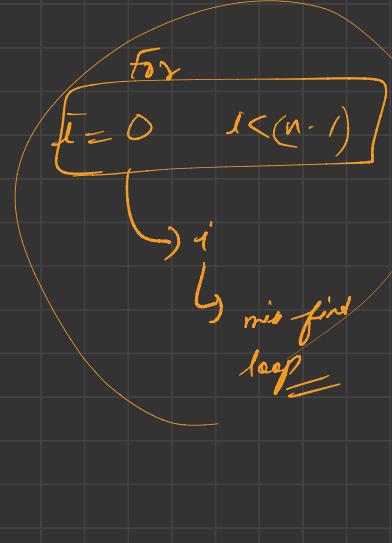
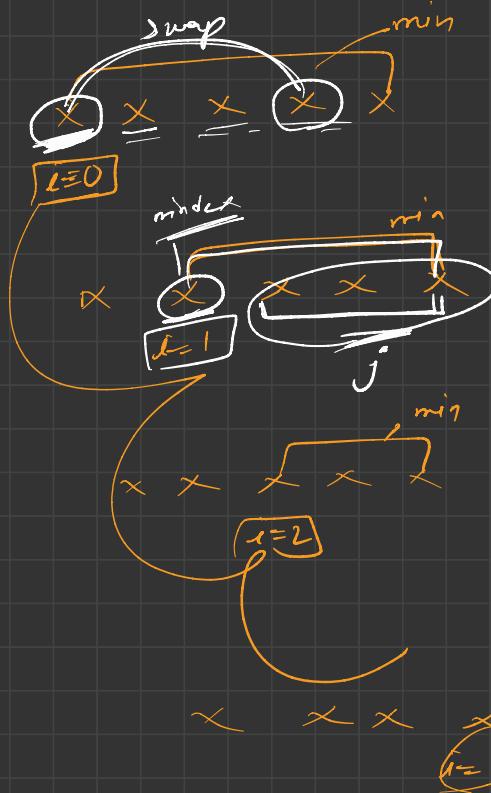
11 12 22 25 64

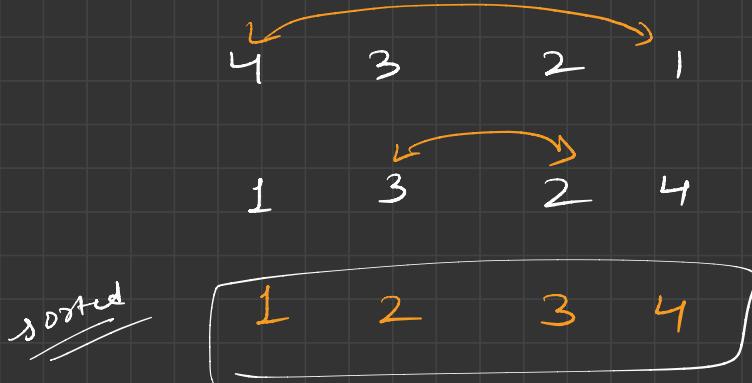
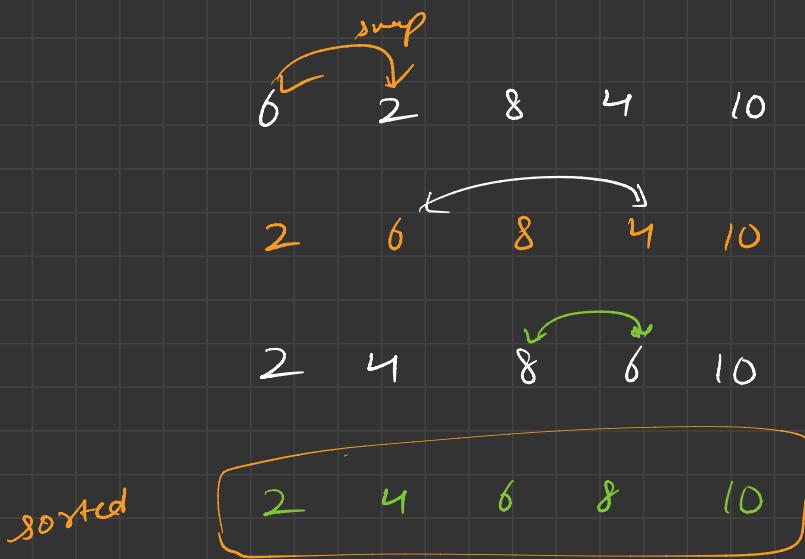
$i=3$

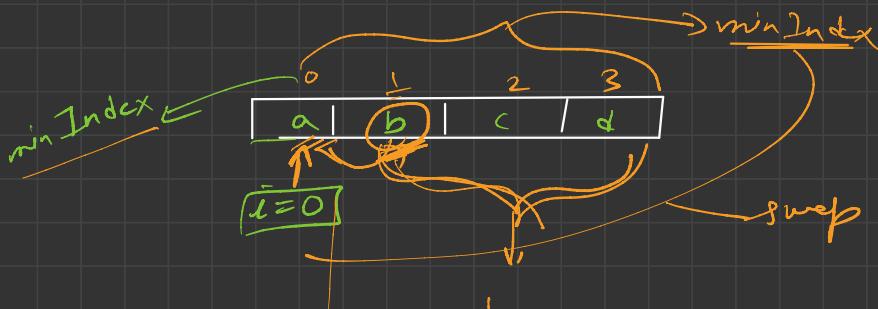
~ $\boxed{\text{Total Round} = (n-1)}$



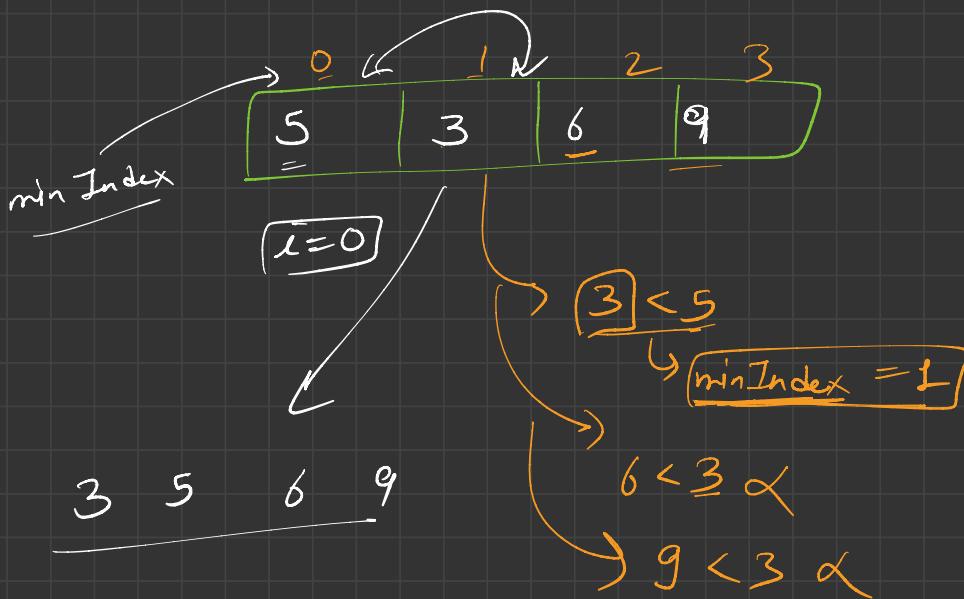
$x \ x \ x \ x \ | \underline{x}$ Sorted







$$b \underset{\cancel{a}}{a} c \underset{\cancel{d}}{d} \quad \text{by } \underline{\text{minIndex} = 1}$$



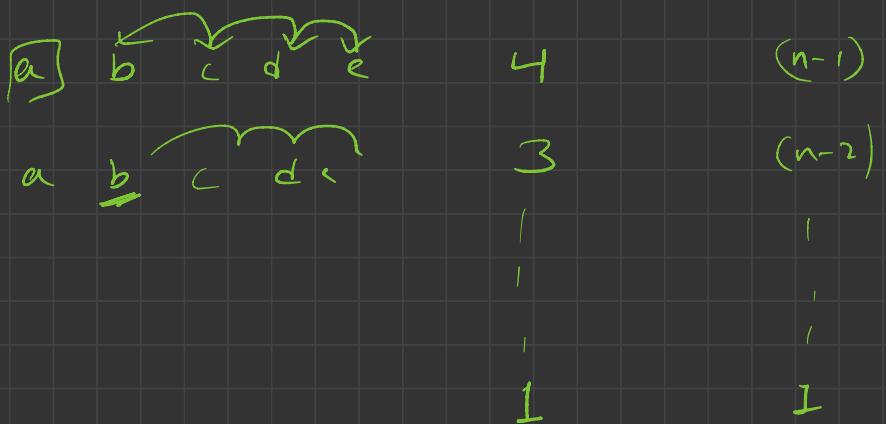
$$3 < 5 \quad \text{by } \underline{\text{minIndex} = 1}$$

$$6 < 3 \times$$

$$9 < 3 \times$$

For $(0 \rightarrow (n-1))$
 ↓
 For $(i+1 \rightarrow n)$
Space complexity
O(1)

Time complexity n size



$$1 + 2 + 3 - \dots - (n-2) + (n-1)$$

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

$T.C \rightarrow O(n^2)$

T-C

Best Case \rightarrow already sorted $\rightarrow \underline{\underline{O(n^2)}}$

Worst Case $\rightarrow \underline{\underline{O(n^2)}}$

4 3 2 1

Vsc Case:-

array / vector/list
size small

what \rightarrow
=

T-C \rightarrow Out
worst

Worst Case $\rightarrow ?$

Code \rightarrow

Dry run

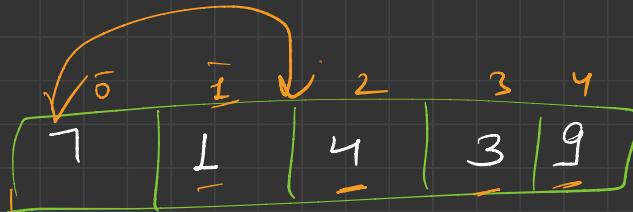
Homework

Flowchart

Stable or Unstable $\rightarrow ?$

what

\downarrow
Selection sort?



$$\begin{array}{c} i=0 \\ \hline \min \text{Index} = 0 \end{array}$$

$| < 7 \rightarrow$ TRUE

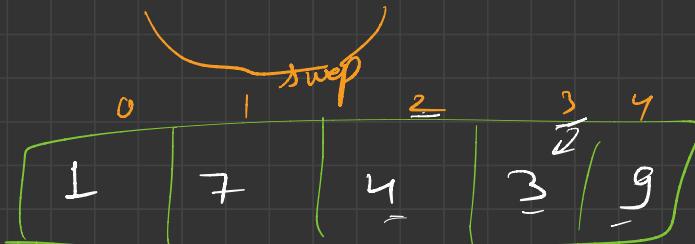
↳ Update minIndex
↳ minIndex ≠ 1

↳ $4 < 1 \rightarrow \text{False} \rightarrow \text{ignore}$

$3 < 1 \rightarrow$

$\hookrightarrow g < 1 \rightarrow$ false

$i=0$ $\minIndex = 1$



1

minIndex = 1

$4 < 7 \rightarrow \text{TRUE}$

$$i=1, \text{ min index} = 3$$

↳ minIndex = 2

↳ $3 < 4 \rightarrow$ TRUE

$$\frac{1}{5} \min_{x \in \mathcal{X}} f(x) = 3$$

$\hookrightarrow g < 3 \rightarrow \text{false} \rightarrow \text{good}$

0	1	2	3	4
1	3	4	7	9

$$\begin{array}{l} i=2 \\ \text{minIndex}=2 \end{array}$$

$7 < 4 \rightarrow \text{false}$
 $9 < 4 \rightarrow \text{false}$

0	1	2	3	4
1	3	4	7	9

$$\begin{array}{l} i=3 \\ \text{minIndex}=3 \end{array}$$

$\leftarrow n-1$

$9 < 7 \rightarrow \text{false}$

$(1 \ 3 \ 4 \ 7 \ 9) \rightarrow \text{sorted}$

*)