



Sunbeam Institute of Information Technology
Pune and Karad
PreCAT
Module – Data Structures

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Sorting Algorithm : Selection Sort

Algorithm:

- Find the minimum element in an array $A[i \rightarrow n-1]$ and place it at beginning
 - where n – size of array and $i = 0, 1, 2, \dots, n-2$
- Repeat the above procedure $n - 1$ times where n is size of array
- Select i th element ($i = 0 \rightarrow n-1$)
 - Compare with all elements other than i th
 - if($A[i] > A[\text{other}]$)
 - Swap both elements

arr	44	11	55	22	66	33
	0	1	2	3	4	5



Sorting Algorithm : Bubble Sort

Algorithm:

- Find the maximum element from two consecutive elements of an array $A[i \rightarrow n-i-1]$ and place it at second location
 - where n – size of array and $i = 0, 1, 2, \dots, n-2$
- Repeat the above procedure $n - 1$ times where n is size of array
- Repeat for $n-1$ times
 - Compare two consecutive elements
 - If left element $>$ right element
 - Swap both elements

arr

33	22	66	55	44	11
0	1	2	3	4	5



Sorting Algorithm : Insertion Sort

Algorithm:

- Repeat from 1 to $n-1$
 - Select i th element in the array
 - Compare i th element with all its left neighbours
 - Insert at appropriate position

arr	55	44	22	66	11	33
	0	1	2	3	4	5



Sorting Algorithms : Merge and Quick Sort

- **Merge sort**

- Divide array in two equal partitions
- Sort two partitions individually
- Merge these sorted partitions into a temp array
- Over write temp array back to original array

- **Quick sort**

- Select pivot element from your array.
- Arrange smaller elements than pivot to the left side of pivot.
- Arrange greater elements than pivot to the right side of pivot.
- Further sort the elements on both sides of pivot separately.





Thank you!

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