

## Algorithm Selection Sort

- In this algorithm, the elements of an array  $LIST[N]$  are sorted into an ascending order.
- Two variables  $SMALL$  and  $POS$  have been used to locate the smallest element in the unsorted part of the array  $LIST$ .
- $Temp$  is variable used to interchange the selected element with the first element of the unsorted part of the array  $LIST$ .

Steps 1: For  $i=1$  to  $N-1$  repeat steps 2 to 7

2:  $SMALL = LIST[i]$ ;  $POS = i$

3: For  $j=i+1$  to  $N$  repeat step 4

4: IF ( $LIST[j] > SMALL$ ) Then

{  $SMALL = LIST[j]$   
 $POS = j$  }

{ end of loop  $j$  }

5:  $TEMP = LIST[i]$ ;

6.  $LIST[i] = LIST[POS]$ ;

7.  $LIST[POS] = TEMP$ ;

{ end of loop  $i$  }

8 End

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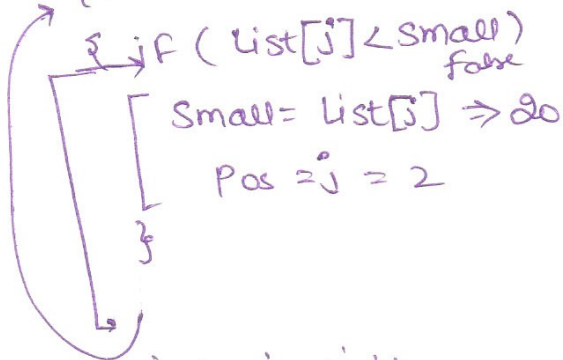
- In this we took two loops, the outer loop  $i$  and inner loop  $j$
- the no. of comparisons needed for  $N$  elements is  $N-1$ , so outer loop  $i$  terminates at  $N-1$  and inner  $j$  loop always start from  $i+1$ th location b/c comparison has to start from 2nd element of unsorted part of the array  $LIST$ .
- \*\*→ In this interchange will take place outside the body of  $j$  loop i.e from step 5 to 7

List	8	20	2	1	4	19	7	11	
i =	1	2	3	4	5	6	7	8	N

Step 1:-  $i = 1$  to  $N-1$

Step 2:  $\{$  small = List[i] = 8

Step 3: for  $\{ j = i+1; j < n; j++ \}$   $j = 2$



$\{$  if (List[3] < 8 (small))   
True  
 Small = List[j]  $\Rightarrow 2$   
 Pos = j  $\Rightarrow 3$   
 $\}$

$j = 4$  if [List[4] < 2   
False True

$\{$  Small = 1 and Pos = 4   
 $j = 5$  if (List[5] < 1   
4 < 1 False

$j = 6$  19 < 1   
False

$j = 7$  7 < 1   
False

$j = 8$  11 < 1   
False  
 End of Loop

temp = List[i]  
 8 = List[0]  
 temp = 8

List[i] = List[Pos]  
 List[0] = List[4]  
 = 1  
 List[Pos] = temp

List[4] = 8  
 = 8

1	20	2	8	4	19	...
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then  $i = 2$   
 ↓ Again all steps

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