INTRO

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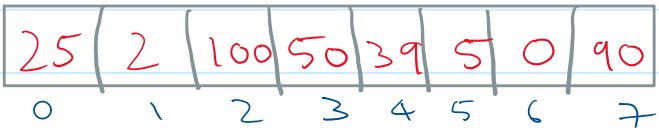
Selection Sort

→ Select the minimum and swap it.
→ after each iteration minimum element is shifted to the left.

Example:



Algorithm:

- Select the range, from 0 → n-1, containg all all the elements, (using a for loop)
- in each iteration, select the minimum element from range of the unsorted array.
- swap the minimum element with the first element of the selected range.
- after each iteration you will find the array is sorted upto the selected range.

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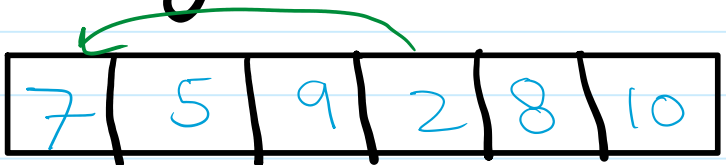
Dry Run :



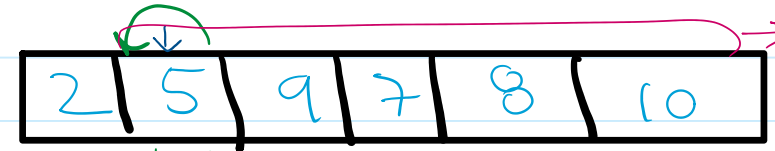
n = 6

selected part

i = 0,

→ select the minimum element using inner loop

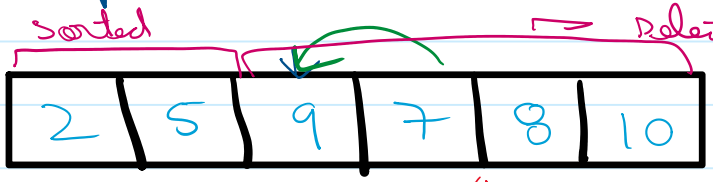
i = 1



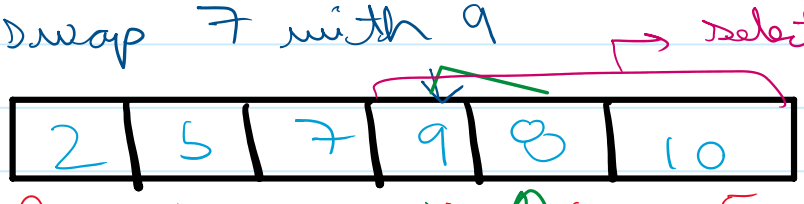
selected

→ swap 5 with 5 .

i = 2



→ swap 7 with 9



i = 3

→ swap 8 with 9 .

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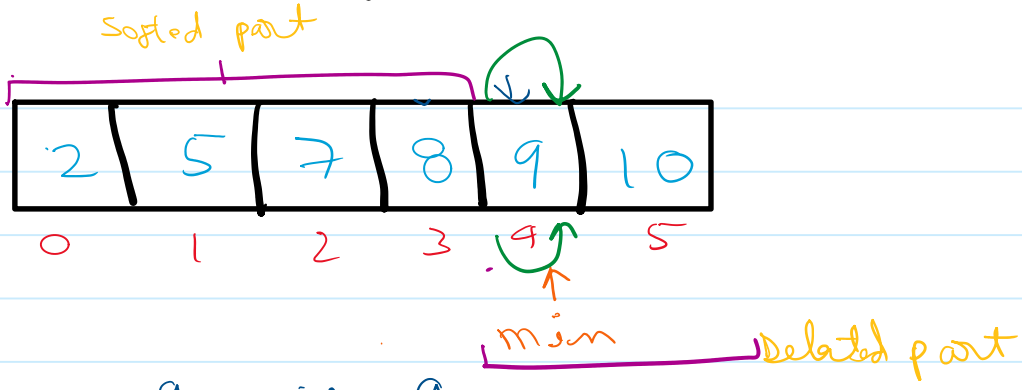
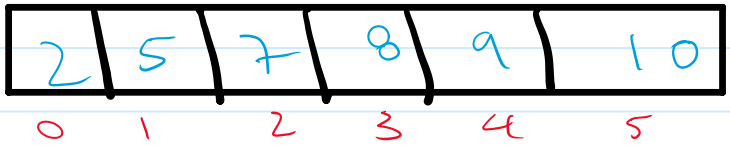
i = 4



→ swap 9 with 9



Note: only one element is left, and one element is always sorted.

→ Stop the iteration

Pseudo Code:

```
for(i=0; i<=n-2){
    mini = i
    for(j=i; j<=n-1){
        if(arr[j] < arr[mini]
            mini = j;
    }
    swap(arr[mini], arr[i]);
}
```

CODE:

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C++

→ function with, input array and array size:

```
void selectionSort(vector<int> &arr, int n)
{
  // outer loop
  for (int i = 0; i <= n - 2; i++)
  {
    int minIndex = i;
    // inner loop to find minimum element
    for (int j = i; j <= n - 1; j++)
    {
      if (arr[j] < arr[minIndex])
        minIndex = j;
    }
    // swap minimum with starting index of selected array
    int temp = arr[minIndex];
    arr[minIndex] = arr[i];
    arr[i] = temp;
  }
}
```

$T.C = O(n^2)$