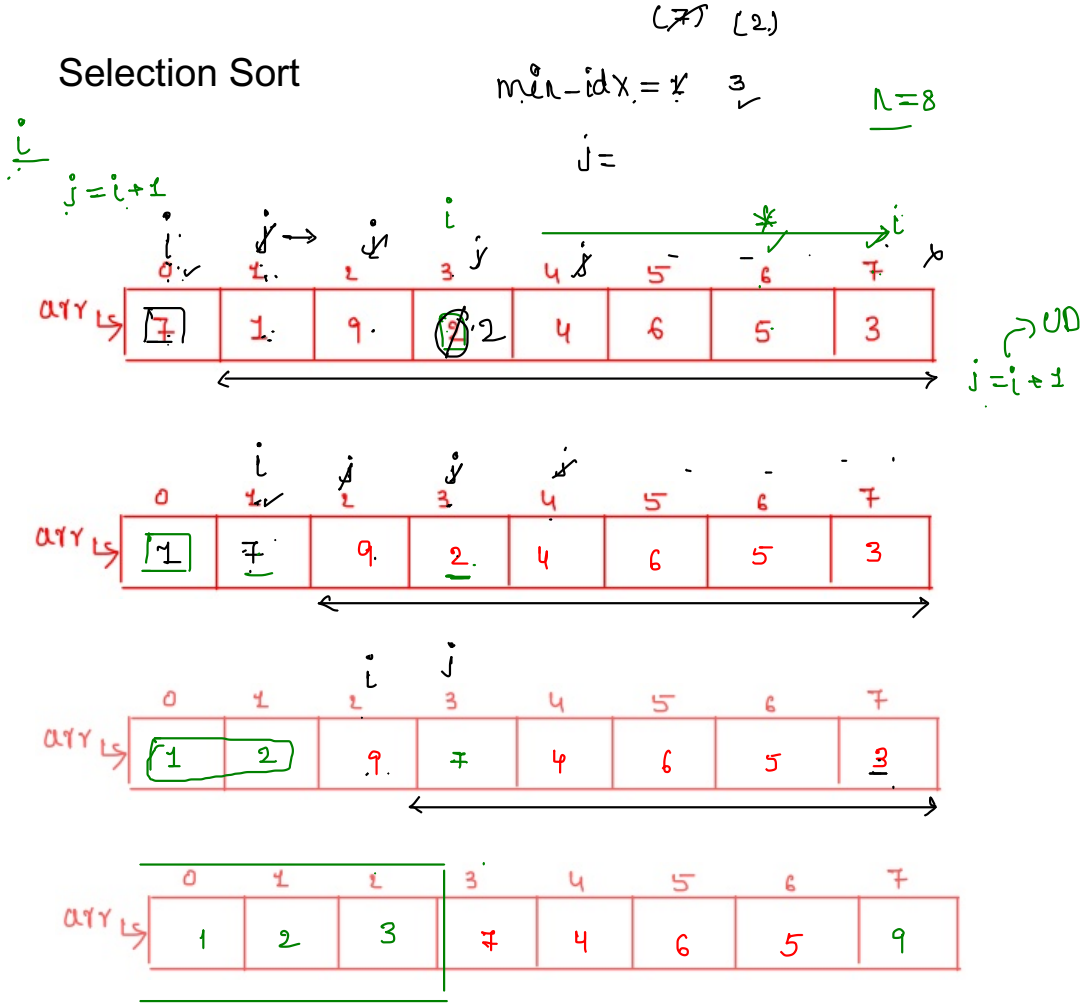
Sprint-4 [Day-2]

Selection Sort



↳ selecting min element, everytime and place it in it's correct position

```
function selectionSort(arr,n)
{
        for(i=0;i<=n-2;i++)
        {
                min_index=i;
                for(j=i+1;j<=n-1;j++)
                {
                        if(arr[j]<arr[min_index])
                        {
                                min_index=j;
                        }
                }
                //swap arr[i], arr[min_index]
                temp=arr[i];
                arr[i]=arr[min_index]
                arr[min_index]=temp
        }
        return arr;
}
```

```
function selectionSort(arr,n)
{
	for(i=0;i<=n-2;i++)
	{
		min_index=i;
		for(j=i+1;j<=n-1;j++)
		{
			if(arr[j]<arr[min_index])
			{
				min_index=j;
			}
		}
		//swap arr[i], arr[min_index]
		temp=arr[i];
		arr[i]=arr[min_index]
		arr[min_index]=temp
	}
	return arr;
}
```

```
function bubbleSort(arr,n)
{
        for(i=0;i<=n-2;i++)
        {
                isSwapped=0;
                for(j=0;j<=n-i-2;j++)
                {
                        if(arr[j]>arr[j+1])
                        {
                                isSwapped=1;
                                temp=arr[j];
                                arr[j]=arr[j+1];
                                arr[j+1]=temp
                        }
                }
                if(isSwapped==0)
                {
                        break;
                }
        }
        return arr;
}
```

1. w.c i/p : $O(n^2)$

2. b.c i/p : $O(n)$ ✓

swap

✓ more swap's

→ stable sorting Algo ✓

```
function selectionSort(arr,n)
{
        for(i=0;i<=n-2;i++) → n
        {
                min_index=i;
                for(j=i+1;j<=n-1;j++) → n
                {
                        if(arr[j]<arr[min_index])
                        {
                                min_index=j;
                        }
                }
                //swap arr[i], arr[min_index]
                temp=arr[i];
                arr[i]=arr[min_index]
                arr[min_index]=temp
        }
        return arr;
}
```

1. worst case i/p : $O(n^2)$

2. best case i/p : $O(n^2)$.

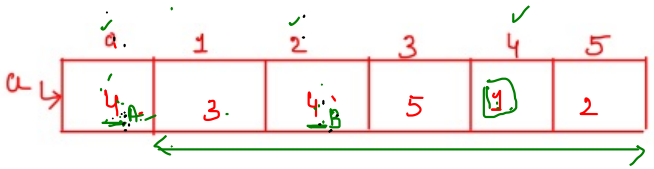
swap

less swaps ✓

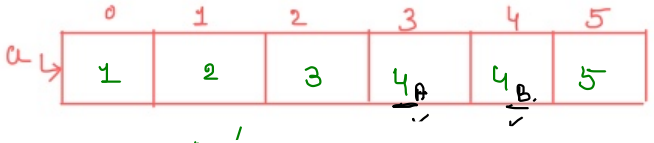
→ not stable, but we can convert to stable sorting by using extra space

Selection sort (stable / not)

i/p

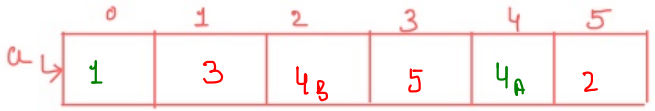


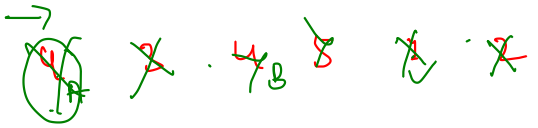
o/p



relative ordering.

P1 :-





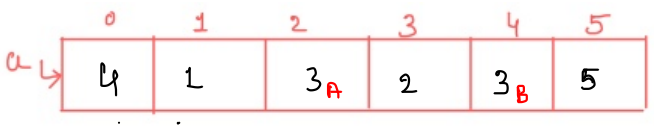
res :- 1 2 3 4A 4B 5

selection sort is not a stable sort

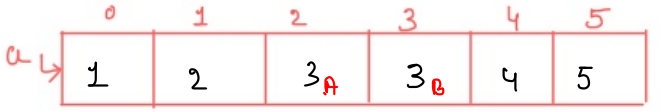
By using extra space we can convert into stable sorting Algo

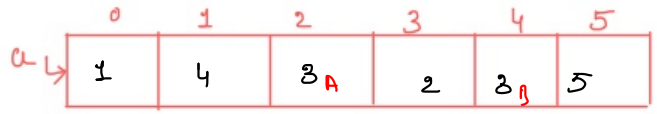
How?

Bubble sort



⇒





1 3A 4 2 3B 5

1 3A 2 4 3B 5

1 3A 2 3B 4 5 ✓

1 2 3A 3B 4 5 ✓

∴ Bubble sort

Stable sort ✓

- Merge-sort
- Quick-sort

video ✓

Couple Ew

OJ ✓

sort_out

↑

make_leadership

→ Bubble sort + extra array. ✓

Endrl PSC ✓

nick-Hau ✓

Lrec ✓