Sorting

Bubble sort

```
for (i=0; i<=n-1; i++) {
    bool isSwap = false;
    for (j=0; j<=n-1-i; j++) {
        if (arr[j] > arr[j+1]) {
            temp = arr[j];
            arr[j] = arr[j+1];
            arr[j+1] = temp;
            isSwap = true;
        }
    }
    if (!isSwap) return;
}
```

swap nahi horaha hai aur kahi!

Selection sort

```
for (i=0; i<n-1; i++) {
    int smallestIdx = i;
    for (j=i+1; j<n; j++) {
        if (arr[j] < arr[SI]) {
            SI = j
        }
    }
    swap(arr[i], arr[SI])
}
```

Dry run

4 1 5 2 3

US

smallest

1 4 5 2 3

S <— US —>

1 2 5 4 3

S <— US —>

1 2 3 4 5

S US

1 2 3 4 5

S

Insertion sort

```
for (i=1; i<n; i++) {
    curr = arr[i];
    prev = i-1;
    while (prev>=0 && arr[prev] > curr) {
        arr[prev+1] = arr[prev];
        prev--;
    }
    arr[prev+1] = curr;
}
```

Dry run

4 5 2 3 — curr = 1

S US

4 5 2 3

S US

1 4 5 2 3 — curr = 5

S US

1 4 5 2 3

S US

1 4 5 3 — curr = 2

S US

1 4 5 3

S US

1 2 4 5 3 — curr = 3

S US

1 2 4 5

S US

1 2 3 4 5