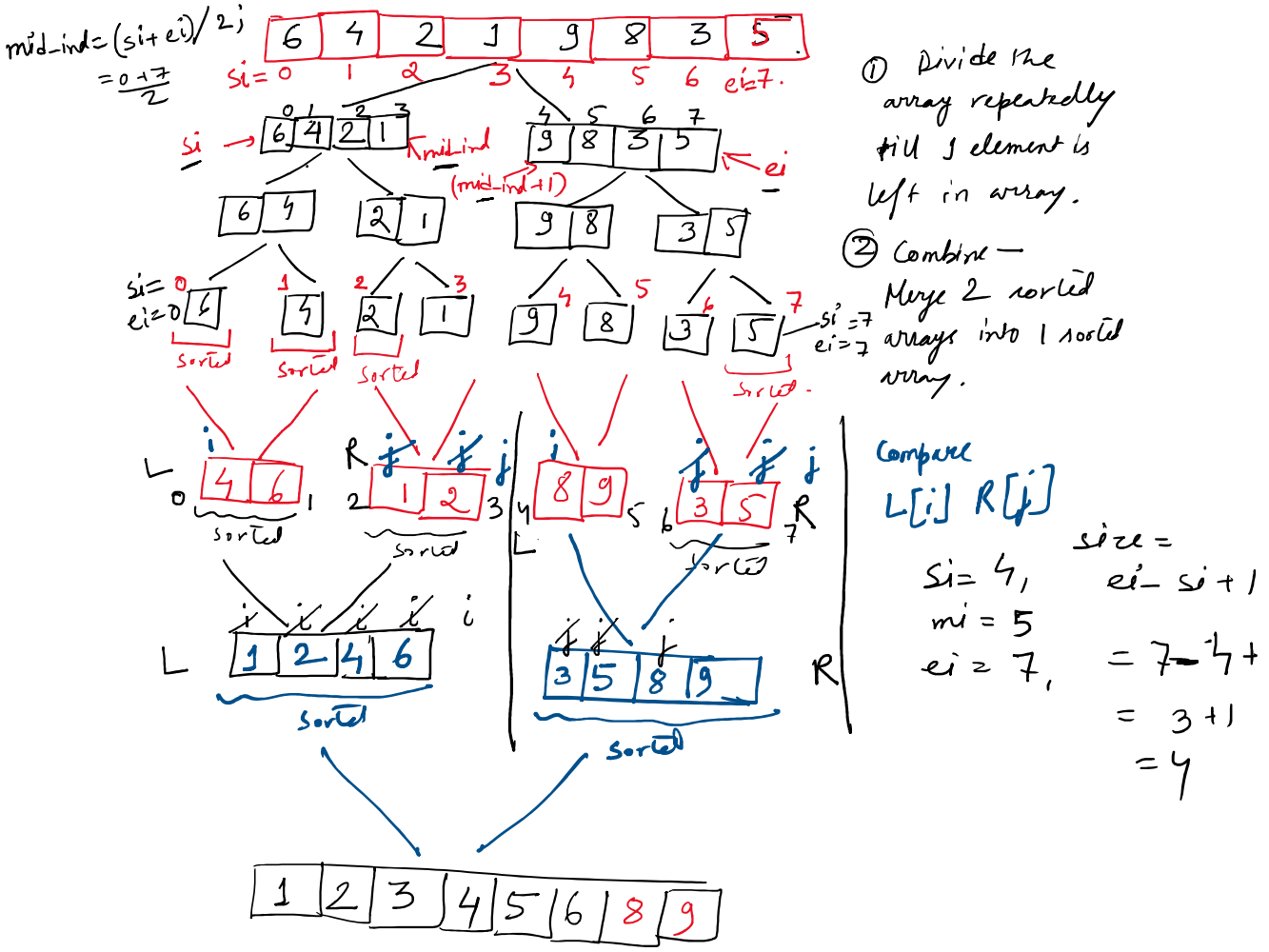

① Divide the array repeatedly till 1 element is left in array.

② Combine — Merge 2 sorted arrays into 1 sorted array.

```
main(){
    divide(arr, 0, n-1);
}
```

si = 10^5
ei = 10^5
limit = 10^5

$(si+ei) = 2 \times 10^5$ → Integer overflow

```
divide(arr[], si, ei){
    if(si < ei)
    {
        mid_ind = (si+ei)/2;
        divide(arr[], si, mid_ind);
        divide(arr[], mid_ind+1, ei);
        merge(arr[], si, mid_ind, ei);
    }
```

left arr → si, mid_ind
right arr → mid_ind+1, ei

2 sorted arrays ko merge into 1 sorted array.

```
merge(arr, si, mid_ind, ei){
    int mergedarr[] = new int[ei-si+1];
```

left_arr → si, m
right_arr → m+1, ei

```
int i=si, j=m+1; k=0

while(i<=midind && j<=ei)
{   if(arr[i]<=arr[j]) {
        mergedarr[k] = arr[i];
        k++;
        i++;
    }
    else {  mergedarr[k] = arr[j];
            k++;
            j++;
    }
}
                                    // left mein elements hain
while(i<=m){                        // Right mein no elements.
        mergedarr[k] = arr[i];
        k++;
        i++;
}

// Right mein elements hain, left mein nahin hain.
while(j<=ei){
        mergedarr[k] = arr[j];
        k++;
        j++;
}

// copy elements from merged_arr to original array.
```