

```
int main()
```

```
int arr[] = { 38, 27, 43, 3, 9, 82, 10 }
```

38	27	43	3	9	82	10
0	1	2	3	4	5	6

```
mergesort ( array , 0 , size-1 )
```

```
mergesort ( arr[] , int left , int right )
```

```
if ( left < right )
```

ms (0 — 6)

```
int mid = left + ( right + left ) / 2
```

mid = 3

```
mergesort ( arr[] , left , right )
```

mid
↓

ms (0 — 3)
ms (0 — 6)

38	27	43	3	9	82	10
0	1	2	3	4	5	6

38	27	43	3
0	1	2	3

again call back to mergesort function

```
mergesort ( arr[] , int left , int right )
```

```
if ( left < right )
```

```
int mid = left + ( right + left ) / 2
```

```
mergesort ( arr[] , int left , mid )
```

ms(0 — 1)
ms(0 — 3)
ms(0 — 6)

38 | 27 | 43 | 3 | 9 | 82 | 10
0 1 2 3 4 5 6

38 | 27 | 43 | 3
0 1 2 3

38 | 27
0 1

again call merge sort function

~~ms(0 — 0)~~
ms(0 — 1)
ms(0 — 3)
ms(0 — 6)

38 | 27 | 43 | 3 | 9 | 82 | 10

38 | 27 | 43 | 3

38 | 27

38
0

mergesort(int arr, left, right)

if (L < R)

mid = $\text{Left} + \frac{(\text{Right} - \text{left})}{2}$

= 0

mergesort(int arr, left, mid)

again go back to mergesort function

if (L < R)

ms(0 — 1)
ms(0 — 3)
ms(0 — 6)

38

mergesort(int arr, mid+1, Right)

ms(0, 0, 1)

~~ms(0, 1, 1)~~

ms(0, —, 1)

ms(0, —, 3)

ms(0, —, 6)

38 27 43 3 9 82 10

38 27 43 3

38 27

38

27

go to merge function

merge(arr[], L, m, R)

int temp[right + 1]

int i = left; 0

int j = mid + 1 0 + 1 = 1

int k = left; 0

while (i ≤ mid & j ≤ right)

if (arr[i] > arr[j])

temp[k] = arr[j];

k++;

i++;

else { temp[k] = arr[i];

k++; i++;

}

while (i ≤ mid) {

temp[k] = arr[i];

k++; i++;

while (j ≤ right) {

i=0
38

27

0
k=0

1
j=1

temp 27 38

0 k=1

k=1

i=1

j=2

27 38

DATE: _____

DAY: _____

top →

~~ms(0-1)~~
ms(0-3)
ms(0-6)

38
0

27
1

27

38

27 38
0 1

38 27 43 3 9 82 10
0 1 2 3 4 5 6

← 38 27 43 3
0 1 2 3

38 27

38

27

27

38

27 38

1+1
mid+1, r)

again call mergesort(int arr[7], left, right)

ms(2,3)
ms(0-3)
ms(0-6)

38 27 43 3 9 82 10
0 1 2 3 4 5 6

38 27 43 3

27 38

3 43

27

38

38

43

same process till the end.

we have 3, 9, 27, 38, 42, 82