

병합정렬 (Merge Sort)

» 병합정렬

- 안정 정렬 에 속하며, **분할 정복 알고리즘**의 하나 이다
- 하나의 리스트를 두 개의 근등한 크기로 분할하고 분할된 부분 리스트를 정렬한 후, 정렬된 부분 리스트를 합하여 전체가 정렬된 리스트가 되게 하는 방법

◆ 정렬 단계

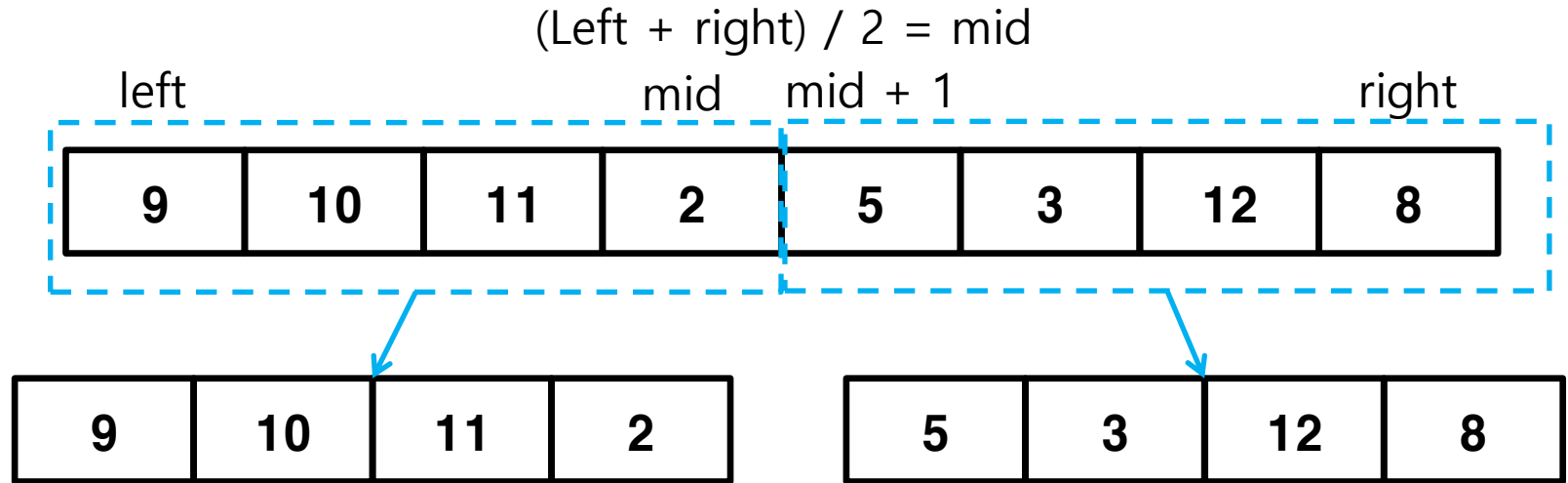
- 분할(Divide): 입력 배열을 같은 크기의 2개의 부분 배열로 분할
- 정복(Conquer): 재귀함수를 이용하여 부분 배열을 정렬
- 결합(Combine): 정렬된 부분 배열들을 하나의 배열에 합병

01

>> 병합정렬[오름차순]

02

03



01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

03

left

mid mid + 1

right

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---	----	----	---	---	---	----	---

left mid mid + 1 right

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mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

left

right

left

right

3	5	8	12
---	---	---	----

mid

mid + 1

mid

mid + 1

3			
---	--	--	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid

mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left

mid

mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

left

right

left

right

3	5	8	12
---	---	---	----

mid

mid + 1

mid

mid + 1

3	5		
---	---	--	--

>> 병합정렬(오름차순)

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left

mid

mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

left

right

left

right

3	5	8	12
---	---	---	----

mid

mid + 1

mid

mid + 1

3	5	8	
---	---	---	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left

mid

mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

left

right

left

right

3	5	8	12
---	---	---	----

mid

mid + 1

mid

mid + 1

3	5	8	12
---	---	---	----

03

01

>>병합정렬[오름차순]

02

$$(Left + right) / 2 = mid$$

left

mid

mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left

mid

mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

left

right

3	5
---	---

mid

mid + 1

left

right

8	12
---	----

mid

mid + 1

03

3	5	8	12
---	---	---	----

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

--	--	--	--	--	--	--	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2							
---	--	--	--	--	--	--	--

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3						
---	---	--	--	--	--	--	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5					
---	---	---	--	--	--	--	--

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8				
---	---	---	---	--	--	--	--

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid

mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left

mid

mid + 1

right

2	9	10	11
---	---	----	----

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

2	3	5	8	9			
---	---	---	---	---	--	--	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10		
---	---	---	---	---	----	--	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	
---	---	---	---	---	----	----	--

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	9	10	11	3	5	8	12
---	---	----	----	---	---	---	----

left mid mid + 1 right

2	9	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

03

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	3	10	11	3	5	8	12
---	---	----	----	---	---	---	----

03

left mid mid + 1 right

2	3	10	11
---	---	----	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

01

>>병합정렬[오름차순]

02

$$(Left + right) / 2 = mid$$

left

mid mid + 1

right

2	3	5	11	3	5	8	12
---	---	---	----	---	---	---	----

left mid mid + 1 right

2	3	5	11
---	---	---	----

left mid mid + 1 right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

03

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid

mid + 1

right

2	3	5	8	3	5	8	12
---	---	---	---	---	---	---	----

left

mid

mid + 1

right

2	3	5	8
---	---	---	---

left

mid

mid + 1

right

3	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

03

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	3	5	8	9	5	8	12
---	---	---	---	---	---	---	----

03

left mid mid + 1 right

2	3	5	8
---	---	---	---

left mid mid + 1 right

9	5	8	12
---	---	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

01

>> 병합정렬(오름차순)

02

$$(left + right) / 2 = mid$$

left

mid

mid + 1

right

2	3	5	8	9	10	8	12
---	---	---	---	---	----	---	----

03

left

mid

mid + 1

right

2	3	5	8
---	---	---	---

left

mid

mid + 1

right

9	10	8	12
---	----	---	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

03

left mid mid + 1 right

2	3	5	8
---	---	---	---

left mid mid + 1 right

9	10	11	12
---	----	----	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

01

>>병합정렬[오름차순]

02

$$(left + right) / 2 = mid$$

left

mid mid + 1

right

03

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----

2	3	5	8	9	10	11	12
---	---	---	---	---	----	----	----