# 5. DIVIDE AND CONQUER I

‣ *merge demo*

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

↑

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

↑

compare minimum entry in each list:  copy 2

sorted list C

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

↑

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|---|---|---|

↑

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|---|---|---|---|

↑

compare minimum entry in each list:  copy 3

sorted list C

| 2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

↑

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

↑

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

↑

compare minimum entry in each list:   copy 7

sorted list C

| 2 | 3 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|

↑

# Merge demo

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

compare minimum entry in each list:  copy 10

sorted list C

| 2 | 3 | 7 |  |  |  |  |  |  |  |
|---|---|---|--|--|--|--|--|--|--|

# Merge demo

Given two sorted lists $A$ and $B$, merge into sorted list $C$.



sorted list A

| 3 | 7 | 10 | 14 | 18 |

sorted list B

| 2 | 11 | 16 | 17 | 23 |

compare minimum entry in each list:  copy 11

sorted list C

| 2 | 3 | 7 | 10 | | | | | | |

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

↑

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

↑

compare minimum entry in each list:  copy 14

sorted list C

| 2 | 3 | 7 | 10 | 11 | | | | | |
|---|---|---|----|----|---|---|---|---|---|

↑

Given two sorted lists $A$ and $B$, merge into sorted list $C$.

sorted list A

| | | | | |
|---|---|---|---|---|
| 3 | 7 | 10 | 14 | 18 |

sorted list B

| | | | | |
|---|---|---|---|---|
| 2 | 11 | 16 | 17 | 23 |

compare minimum entry in each list:  copy 16

sorted list C

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | 7 | 10 | 11 | 14 | | | | |

# Merge demo

Given two sorted lists *A* and *B*, merge into sorted list *C*.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

↑

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

↑

compare minimum entry in each list:  copy 17

sorted list C

| 2 | 3 | 7 | 10 | 11 | 14 | 16 | | | |
|---|---|---|----|----|----|----|--|--|--|

↑

Given two sorted lists *A* and *B*, merge into sorted list *C*.

sorted list A

| 3 | 7 | 10 | 14 | 18 |

sorted list B

| 2 | 11 | 16 | 17 | 23 |

compare minimum entry in each list:   copy 18

sorted list C

| 2 | 3 | 7 | 10 | 11 | 14 | 16 | 17 | | |

# Merge demo

Given two sorted lists *A* and *B*, merge into sorted list *C*.
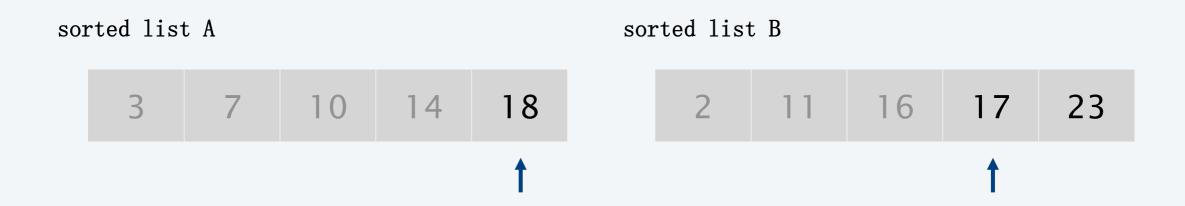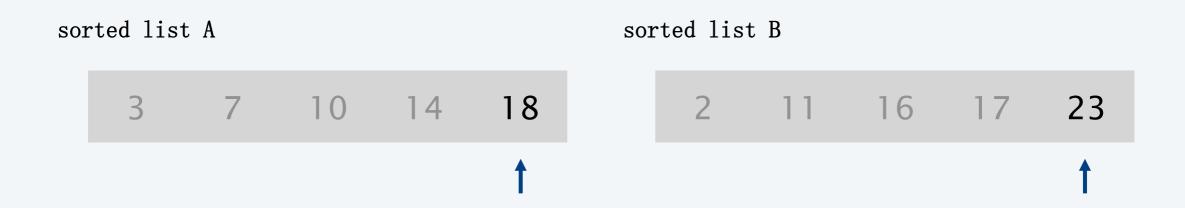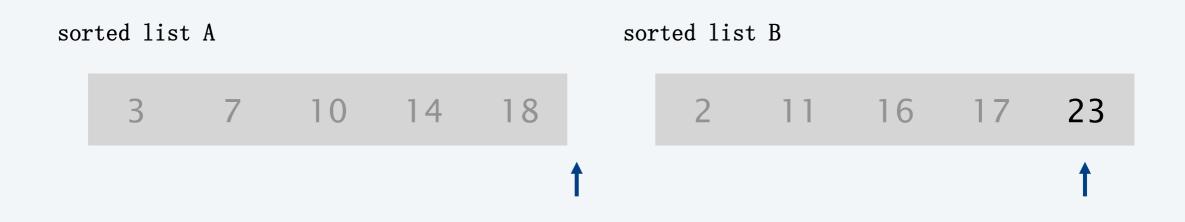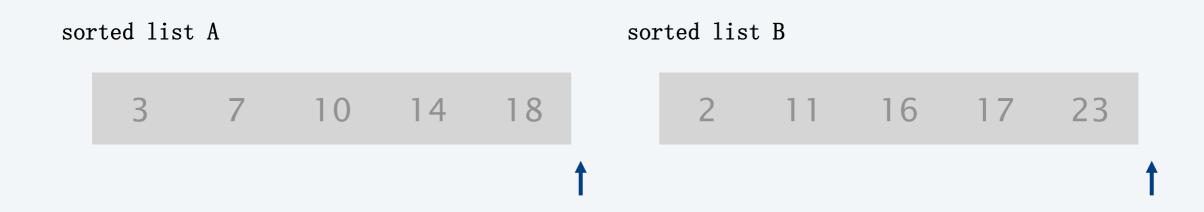
sorted list A

| 3 | 7 | 10 | 14 | 18 |

sorted list B

| 2 | 11 | 16 | 17 | 23 |

list A exhausted: copy 23

sorted list C

| 2 | 3 | 7 | 10 | 11 | 14 | 16 | 17 | 18 |

Given two sorted lists *A* and *B*, merge into sorted list *C*.

sorted list A

| 3 | 7 | 10 | 14 | 18 |
|---|---|----|----|----|

sorted list B

| 2 | 11 | 16 | 17 | 23 |
|---|----|----|----|----|

done

sorted list C

| 2 | 3 | 7 | 10 | 11 | 14 | 16 | 17 | 18 | 23 |
|---|---|---|----|----|----|----|----|----|----|