Assignment5 - 44251017 Huang Jiahui

Level1

lower bound of job A in Level 1 =

max { 1st stage: 3 + (3+4+4) + min(8,6,5) = 19

2nd stage: 5 + (5+2+4) + min(3,4,1) = 17

3rd stage: 10 + (3+4+1) + 0   = 18 } = 19

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lower bound of job B in Level 1 =

max { 1st stage: 3 + (3+4+4) + min(7,6,5) = 19

2nd stage: 8 + (2+2+4) + min(5,4,1) = 17

3rd stage: 11 + (5+4+1) + 0   = 21 } = 21

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lower bound of job C in Level 1 =

max { 1st stage: 4 + (3+3+4) + min(7,8,5) = 19

2nd stage: 6 + (2+5+4) + min(5,3,1) = 18

3rd stage: 10 + (5+3+1) + 0   = 19 } = 19

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lower bound of job D in Level 1 =

max { 1st stage: 4 + (3+3+4) + min(7,8,6) = 20

2nd stage: 8 + (2+5+2) + min(5,3,4) = 20

3rd stage: 9 + (5+3+4) + 0   = 21 } = 21

> Thus, it is no need to search node B and node D

Level2

In case of choosing job A, lower bound of job B in Level 2 =

max { 1st stage: 6 + (4+4) + min(6,5)   = 19

2nd stage: 11 + (2+4) + min(4,1) = 18

3rd stage: 14 + (4+1) + 0   = 19 } = 19

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lower bound of job C in Level 2 =

max { 1st stage: 7 + (3+4) + min(8,5)   = 19

2nd stage: 9 + (5+4) + min(3,1)   = 19

3rd stage: 14 + (3+1) + 0   = 18 } = 19

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lower bound of job D in Level 2 =

$max\{$ 1st stage: 7 + (3+4) + $min(8,6)$ = 20

2nd stage: 11 + (5+2) + $min(3,4)$ = 21

3rd stage: 12 + (3+4) + 0   = 19 } = 21

> Thus, it is no need to search node D

In case of choosing job C, lower bound of job A in Level 2 =

$max\{$ 1st stage: 7 + (3+4) + $min(8,5)$ = 19

2nd stage: 8 + (5+4) + $min(3,1)$ = 18

3rd stage: 15 + (3+1) + 0   = 19 } = 19

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lower bound of job B in Level 2 =

$max\{$ 1st stage: 7 + (3+4) + $min(7,5)$ = 19

2nd stage: 12 + (2+4) + $min(5,1)$ = 19

3rd stage: 15 + (5+1) + 0   = 21 } = 21

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lower bound of job D in Level 2 =

$max\{$ 1st stage: 8 + (3+3) + $min(7,8)$ = 21

2nd stage: 12 + (2+5) + $min(5,3)$ = 22

3rd stage: 13 + (5+3) + 0   = 21 } = 22

> Thus, it is no need to search node B and node D

Level3

If we choose the sequence of job AB, lower bound of job C in Level 3 =

$max\{$ 1st stage: 10 + 4 + $min(5)$ = 19

2nd stage: 13 + 4 + $min(1)$ = 18

3rd stage: 18 + 1 + 0   = 19 } = 19

lower bound of job D in Level 3 =

$max\{$ 1st stage: 10 + 4 + $min(6)$ = 20

2nd stage: 15 + 2 + $min(4)$ = 21

3rd stage: 16 + 4 + 0   = 20 } = 21

> Thus, it is no need to search node D

If we choose the sequence of job AC, lower bound of job B in Level 3 =

max { 1st stage: 10 + 4 + min(5)   = 19

     2nd stage: 15 + 4 + min(1)   = 20

     3rd stage: 18 + 1 + 0   = 19 } = 20

lower bound of job D in Level 3 =

max { 1st stage: 11 + 3 + min(8)   = 22

     2nd stage: 15 + 5 + min(3)   = 23

     3rd stage: 16 + 3 + 0   = 19 } = 23

> Thus, it is no need to search node D

If we choose the sequence of job CA, lower bound of job B in Level 3 =

max { 1st stage: 10 + 4 + min(5)   = 19

     2nd stage: 15 + 4 + min(1)   = 20

     3rd stage: 18 + 1 + 0   = 19 } = 20

lower bound of job D in Level 3 =

max { 1st stage: 11 + 3 + min(8)   = 22

     2nd stage: 15 + 5 + min(3)   = 23

     3rd stage: 16 + 3 + 0   = 19 } = 23

> Thus, it is no need to search node D

Finally, we choose the sequence A → B → C → D, the process time is 19min

Job Sequence