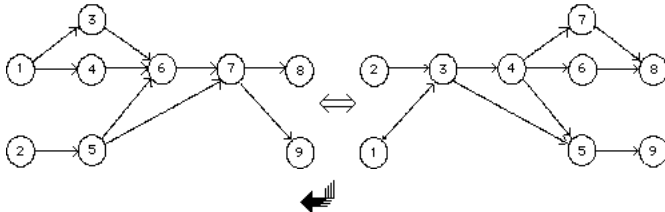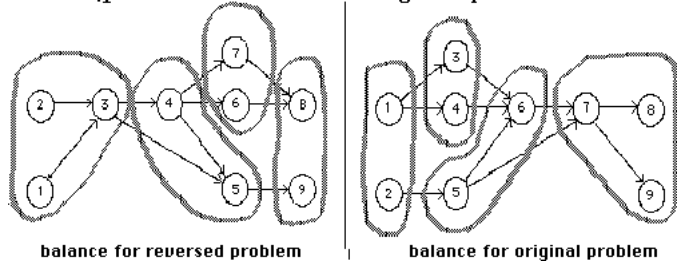## Reversed RPWM

This is the Ranked Positional Weight Method, applied to the problem with the precedence restrictions reversed:
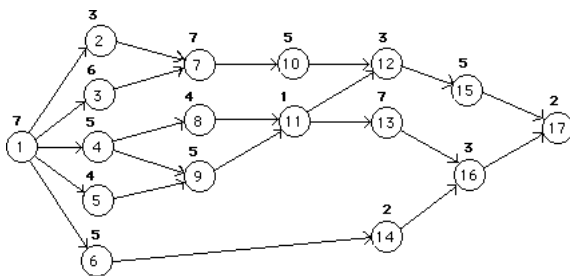
⟺

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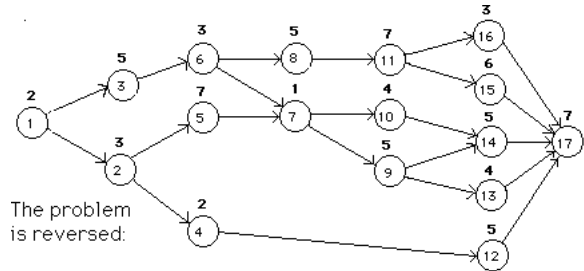
After a balance is found for the reversed problem, then the problem is "un-reversed" to get a balance for the original problem.

balance for reversed problem | **balance for original problem**

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The problem is reversed:

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

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Add Task 1 to station 1
Time at station 1 is now 2
    (Idle time: 13)
Add Task 3 to station 1   Station #1
Time at station 1 is now 7
    (Idle time: 8)
Add Task 6 to station 1
Time at station 1 is now 10
    (Idle time: 5)
Add Task 2 to station 1
Time at station 1 is now 13
    (Idle time: 2)
Add Task 4 to station 1
Time at station 1 is now 15
    (Idle time: 0)
No additional tasks may be added to this station.

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

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Station #2

Add Task 5 to station 2
Time at station 2 is now 7
    (Idle time: 8)
Add Task 8 to station 2
Time at station 2 is now 12
    (Idle time: 3)
Add Task 7 to station 2
Time at station 2 is now 13
    (Idle time: 2)
No additional tasks may be added to this station.

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

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Station #3

Add Task 11 to station 3
Time at station 3 is now 7
    (Idle time: 8)
Add Task 9 to station 3
Time at station 3 is now 12
    (Idle time: 3)
Add Task 16 to station 3
Time at station 3 is now 15
    (Idle time: 0)
No additional tasks may be added to this station.

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

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Station #4

Add Task 10 to station 4
Time at station 4 is now 4
    (Idle time: 11)
Add Task 15 to station 4
Time at station 4 is now 10
    (Idle time: 5)
Add Task 12 to station 4
Time at station 4 is now 15
    (Idle time: 0)
No additional tasks may be added to this station.

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

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Station #5

Add Task 14 to station 5
Time at station 5 is now 5
    (Idle time: 10)
Add Task 13 to station 5
Time at station 5 is now 9
    (Idle time: 6)
No additional tasks may be added to this station.

Station #6

Add Task 17 to station 6
Time at station 6 is now 7
    (Idle time: 8)
No additional tasks may be added to this station.
*** Line is now balanced.

Now the tasks and stations are reversed again to get original
        sequence

Done

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

Old #	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
New #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
P	2	3	5	2	7	3	1	5	5	4	7	5	4	5	6	3	7
Weight	74	43	55	14	33	50	26	28	21	16	23	12	11	12	13	10	7
Rank	1	4	2	11	5	3	7	6	9	10	8	13	15	14	12	16	17

Solution

17-task Line-Balancing Problem

Number of Stations: 6

Station	Idle time	Tasks
1	8	1
2	6	4 5
3	0	3 6 8
4	0	2 7 9
5	2	10 11 13
6	0	12 14 15 16 17

Balance delay: 0.177778