

RCPSP Data files: The Patterson format

The datasets with instances for the **resource constrained project scheduling problem** (RCPSP) make use of the well-known Patterson format to represent an activity-on-the-node network with renewable resource use. The format is a simple text file and its structure is explained on the illustrative project network of figure 1. Each node above the node is assumed to be the activity duration.

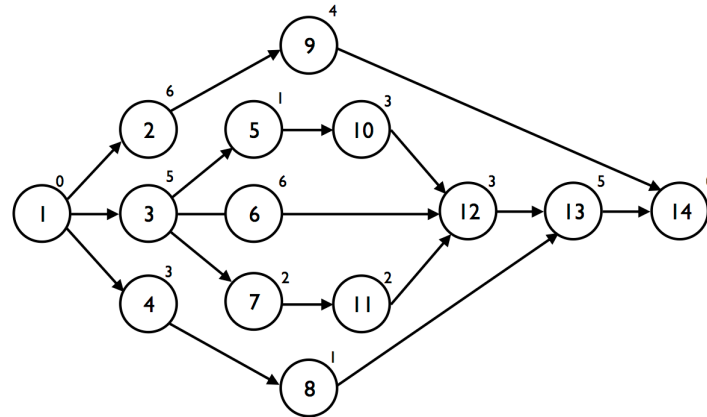


Figure 1. An illustrative activity-on-the-node network

(Source: Figure 7.1 and Table 7.2 of the book "Project Management with Dynamic Scheduling: Baseline Scheduling, Risk Analysis and Project Control")

The network of figure 1 has two dummy activities, i.e. dummy start node 1 and dummy end node 14, and hence, the network contains 14 activities in total, dummies inclusive. The Patterson format also makes use of start and end dummy nodes and is structured as follows:

Line 1:

- Number of activities (starting with node 1 and two dummy nodes inclusive)
- Number of renewable resources

Line 2: (one number for each resource)

- Availability for each renewable resource

Next lines from (one line for each activity, starting with a dummy start activity and ending with a dummy end activity)

- Activity duration
- Resource requirements for each resource type
- Number of successors
- Activity ID for each successor

It is assumed that the project network of figure 1 needs four renewable resource types. Consequently, the Patterson text file for the network of the figure is as follows:

14	4							
10	20	8	10					
0	0	0	0	0	1	2	3	4
6	7	15	2	6	1	9		
5	1	8	4	8	3	5	6	7
3	5	8	3	3	1	8		
1	6	15	2	6	1	10		
3	1	13	0	3	1	12		
2	2	16	2	0	1	11		
1	2	9	4	4	1	13		
4	8	12	5	5	1	14		
3	6	17	5	0	1	12		
1	2	10	2	5	1	12		
3	6	5	5	4	1	13		
5	8	10	3	7	1	14		
0	0	0	0	0	0			

As an example, activity 2 of figure 1 needs 7, 15, 2 and 6 units of resource 1, 2, 3 and 4, respectively. The availability of these resources is set at maximum 10, 20, 8 and 10 units.