

These are instances proposed in P. Fattahi, M. Mehrabad, and F. Jolai. Mathematical modeling and heuristic approaches to flexible job shop scheduling problems. Journal of Intelligent Manufacturing, 18:331-342, 2007, for the Flexible Job-Shop Scheduling Problem. The format is different from the original. In our format, the only information needed is about the operations of the jobs, precedence relations and machines.

Let N be the total number of operations of all jobs, A be the number of precedence relations and K be the number of machines. The operations are labeled from 0 to $N-1$ and the machines are labeled from 0 to $K-1$.

The description of each instance starts with a line that contains the numbers M (machines), J (jobs), and O (operations). Each of the next J lines contains two distinct operations, U and V , indicating that U must be processed before V . Finally, the last O lines describe the operations: the $(J + 2)$ -th line corresponds to operation 0, the $(J + 3)$ -th line corresponds to operation 1 and so on. The description of operations begins with the number of alternative machines (A) that can process the operation followed by " A " pairs of numbers indicating, respectively, the label of a machine and the time that machine takes to process the operation.

[sfjs01](#) 2*2*4 (M*J*O)

0 1
2 3

2	0	25	1	37
2	0	32	1	24
2	0	45	1	65
2	0	21	1	65

[sfjs02](#) 2*2*4 (M*J*O)

0 1
2 3

1	0	43		
2	0	64	1	71
2	0	21	1	35
1	1	43		

[sfjs03](#) 2*3*6 (M*J*O)

0 1
2 3
4 5

1	0	43		
2	0	87	1	95
2	0	63	1	53
1	1	73		
2	0	125	1	135
2	0	43	1	61

[sfjs04](#) 2*3*6 (M*J*O)

0 1
2 3
4 5

2	0	54	1	63
2	0	87	1	95
1	1	120		
1	1	152		
2	0	125	1	135
2	0	143	1	124

[sfjs05](#) 2*3*6 (M*J*O)

0 1
2 3
4 5

2	0	43	1	36
2	0	64	1	71
2	0	34	1	53
2	0	36	1	21
2	0	21	1	35
2	0	43	1	37

[sfjs06](#) 3*3*9 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8

1	0	17		
2	0	40	1	130
2	1	50	2	60
1	0	30		
2	0	150	1	160
1	2	70		
2	0	50	1	60
2	1	170	2	180
2	1	90	2	100

[sfjs07](#) 5*3*9 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8

2	0	117	1	125
2	3	140	1	130
2	3	150	4	160
2	0	214	2	150
2	2	55	1	66
2	4	78	2	65
2	0	87	1	62
2	3	70	2	80
2	3	190	4	100

[sfjs08](#) 4*3*9 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8

2	0	17	1	25
2	3	40	1	30
2	3	150	2	160
2	0	30	2	50

2	3	55	1	66
2	3	78	2	65
2	0	56	1	62
2	1	70	2	80
2	3	90	2	100

[sfjs09](#) 3*3*9 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8

2	0	17	1	25
2	0	40	1	30
2	1	50	2	60
2	0	30	2	50
2	0	50	1	60
2	1	70	2	60
2	0	50	1	60
2	1	70	2	80
2	1	90	2	100

[sfjs10](#) 5*4*12 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11

1	0	147			
2	3	140	1	130	
2	3	150	4	160	
2	0	214	2	150	
2	2	87		1	66
1	4	178			
2	0	87		1	62
1	2	180			
2	3	190	4	100	
2	0	87		1	65
1	4	173			
2	3	145	2	136	

[mfjs01](#) 6*5*15 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11
12 13
13 14

3	0	147	1	123	2	145
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2	3	140	1	130		
2	3	150	4	160		
2	0	214	2	150		
2	2	87	1	66		
2	4	178	5	95		
2	0	87	1	62		
2	2	180	3	105		
3	3	190	4	100	5	153
2	0	87	1	65		
1	4	173				
2	3	145	5	136		
3	1	123	2	145	0	128
3	2	86	3	65	4	47
2	4	110	5	85		

[mfjs02](#) 7*5*15 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11
12 13
13 14

3	0	147	1	123	2	145
3	3	140	1	130	0	123
3	3	150	4	160	6	200
2	0	214	2	150		
3	2	87	1	66	3	99
3	4	178	5	95	6	150
2	0	87		1	62	
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
3	1	123	2	145	0	128
3	2	86	3	65	4	47
2	4	110	5	85		

[mfjs03](#) 7*6*18 (M*J*O)

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

3	0	147	1	123	2	145
3	3	140	1	130	0	123
3	3	150	4	160	6	200
2	0	214	2	150		
3	2	87	1	66	3	99
3	4	178	5	95	6	150
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
3	1	123	2	145	0	128
3	2	86	3	65	4	47
2	4	110	5	85		
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180

[mfjs04](#) 7*7*21 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11
12 13
13 14
15 16
16 17
18 19
19 20

2	0	247	1	223		
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	0	214	2	150		
3	2	87	1	66	3	99
3	4	178	5	95	6	150
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
2	4	110	5	85		
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
3	2	145	1	210	0	157
3	2	124	3	168	4	154
3	4	145	5	165	6	178

[mfjs05](#) 7*7*21 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11
12 13
13 14
15 16
16 17
18 19
19 20

3	0	247	1	223	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178

[mfjs06](#) 7*8*24 (M*J*O)

0 1
1 2
3 4
4 5
6 7
7 8
9 10
10 11
12 13
13 14
15 16
16 17
18 19
19 20
21 22
22 23

3	0	247	1	223	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178

[mfjs07](#) 7*8*32 (M*J*O)

0 1
1 2
2 3
4 5
5 6
6 7
8 9
9 10
10 11
12 13
13 14
14 15
16 17
17 18
18 19
20 21
21 22
22 23
24 25
25 26
26 27
28 29
29 30
30 31

3	0	247	1	223	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	6	210	5	145		
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150

2	4	120	6	150		
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	5	170	6	165		
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
2	4	250	5	170		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
2	3	165	5	180		
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	3	120	6	50		
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178
2	6	230	4	140		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	5	150		

[mfjs08](#) 8*9*36 (M*J*O)

- 0 1
- 1 2
- 2 3
- 4 5
- 5 6
- 6 7
- 8 9
- 9 10
- 10 11
- 12 13
- 13 14
- 14 15
- 16 17
- 17 18
- 18 19
- 20 21
- 21 22
- 22 23
- 24 25
- 25 26
- 26 27
- 28 29
- 29 30
- 30 31
- 32 33
- 33 34
- 34 35

3	0	247	1	123	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200

2	6	210	7	145		
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150
2	4	120	7	150		
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	5	170	7	165		
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
2	4	250	5	170		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
2	7	165	5	180		
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	3	120	6	50		
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178
2	7	230	4	140		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	7	150		
2	1	150	2	150		
2	2	180	3	220		
2	4	40	6	50		
2	5	150	7	170		

[mfjs09](#) 8*11*44 (M*J*O)

0 1
1 2
2 3
4 5
5 6
6 7
8 9
9 10
10 11
12 13
13 14
14 15
16 17
17 18
18 19
20 21
21 22
22 23
24 25
25 26
26 27
28 29

29 30
 30 31
 32 33
 33 34
 34 35
 36 37
 37 38
 38 39
 40 41
 41 42
 42 43

3	0	247	1	123	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	6	210	7	145		
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150
2	4	120	7	150		
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	5	170	7	165		
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
2	4	250	5	170		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
2	7	165	5	180		
3	1	145	2	320	3	154
3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	3	120	6	50		
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178
2	7	230	4	140		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	7	150		
2	1	150	2	150		
2	2	180	3	220		
2	4	40	6	50		
2	5	150	7	170		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	7	150		
2	1	150	2	150		
2	2	180	3	220		
2	4	40	6	50		
2	5	150	7	170		

[mfjs10](#) 8*12*48 (M*J*O)

0 1
1 2
2 3
4 5
5 6
6 7
8 9
9 10
10 11
12 13
13 14
14 15
16 17
17 18
18 19
20 21
21 22
22 23
24 25
25 26
26 27
28 29
29 30
30 31
32 33
33 34
34 35
36 37
37 38
38 39
40 41
41 42
42 43
44 45
45 46
46 47

3	0	247	1	223	2	100
3	3	140	1	130	6	123
3	3	150	4	160	6	200
2	6	210	7	145		
2	0	214	2	150		
2	2	87	1	66		
3	4	178	5	95	6	150
2	4	120	7	150		
2	0	87	1	62		
3	6	145	2	180	3	105
3	3	190	4	100	5	153
2	5	170	7	165		
2	0	87	1	65		
2	2	250	4	173		
2	3	145	5	136		
2	4	250	5	170		
3	1	123	2	145	0	128
3	6	86	3	65	4	47
3	4	110	5	85	1	100
2	7	165	5	180		
3	1	145	2	320	3	154

3	3	150	2	123	4	192
3	4	120	5	240	6	180
2	3	120	6	50		
2	2	145	1	157		
2	2	124	4	168		
3	4	145	5	165	6	178
2	7	230	4	140		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	7	150		
2	1	150	2	150		
2	2	180	3	220		
2	4	40	6	50		
2	5	150	7	170		
2	3	245	2	257		
2	5	224	4	268		
3	4	145	5	165	6	178
2	6	150	7	150		
2	1	150	2	150		
2	2	180	3	220		
2	4	40	6	50		
2	5	150	7	170		
2	2	345	1	357		
2	2	224	4	268		
3	4	145	5	165	6	178
2	7	230	4	340		