

sequencing

n job two machines

There are 5 jobs each of which must go through the two machines A and B in the order A B.

processing time in hours given below.

Jobs	1	2	3	4	5
m-A	10	2	18	16	20
m-B	4	12	14	16	8

Determine the sequence for the five jobs that will minimize the total elapsed time.

the sequence order

2	4	3	5	1
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Jobs	machine A		machine B		Total Time.	
	in	out	in	out	A	B
2		0 2	2	14	2	2
4		2 8	14	30		
3		8 26	30	44		
5		26 46	46	54		2
1		46 56	56	60	4	2
					<hr/>	<hr/>
					4	6

Total minimized elapsed time = 60 hrs

Idle time of A = 4 hrs.

Idle time of B = 6 hrs.

Following are printing and binding times of jobs on respective machines.

Book	1	2	3	4	5	6
Printing machine A	5	7	2	6	3	4
Binding machine B	2	5	4	9	1	3

Determine the order of sequence which minimize the total elapsed time

3	4	2	6	1	5
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Jobs	machine A		machine B		Idle Time
	In	out	In	out	
3	0	2	2	6	2
4	2	8	8	17	2
2	8	15	17	22	
6	15	19	22	25	
1	19	24	25	27	
5	24	27	27	28	1

14

Total minimized
Idle time
Idle time
3 machines n
Find a se
time requi
Jobs
m-A
m-B
m-C
minimum
minimum
maximum
minimum
minimum

total minimized elapsed time = 28 hrs

Idle time for m-A = 1 hr

Idle time for m-B = 4 hrs

3 machines n jobs

find a sequence that minimize the elapsed time required to complete following jobs.

Jobs	1	2	3	4	5
m-A	5	7	6	9	5
m-B	2	1	4	5	3
m-C	3	7	5	6	7

minimum of $A_i = 5$

minimum of $C_i = 3$

maximum of $B_i = 5$

minimum of $A_i \geq$ maximum of B_i (or)

minimum of $C_i \geq$ maximum of B_i

$$5 \geq 5$$

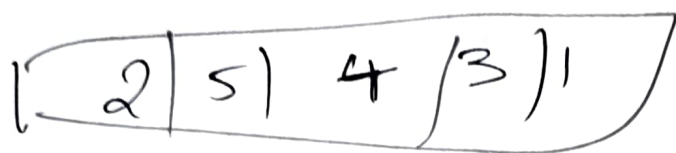
machine H = A+B

machine G = B+C

now my converted problem is

Jobs	1	2	3	4	5
m-H	7	8	10	14	8
m-G	5	8	9	11	10

The sequence order is.



Jobs m-A m-B m-C Idle time

In out In out In out A B

2 0 7 7 8 8 ~~8~~ 15 7 8

5 7 12 12 15 15 ~~22~~ 4

4 12 21 21 26 26 ~~26~~ 32 6

3 21 27 31 32 32 37 1 4

1 27 32 32 34 37 40 1

8 6

8 25

Total minimized elapsed time = 40 hrs

Idle time m-A = 8 hrs

Idle time m-B = 25 hrs

Idle time m-C = 12 hrs.

Find the sequence for the following 8 jobs that will minimize the total elapsed time for the completion of all jobs. Each job is processed in the same order C A B Entries if give the time in order.

Jobs 1 2 3 4 5 6 7 8

m-A 4 6 7 4 5 3 6 2

m-B 8 10 7 8 11 8 9 13

m-C 5 6 2 3 4 9 15 11

m-C 5 6 2 3 4 9 15 11

m-A 4 6 7 4 5 3 6 2

m-B 8 10 7 8 11 8 9 13

Solution.

minimum of $C_i = 2$

minimum of $B_i = 7$

maximum of $A_i = 7$

minimum of $C_i \geq$ maximum of A_i (or)

minimum of $B_i \geq$ maximum of A_i

$$7 \geq 7$$

machine H = C + A

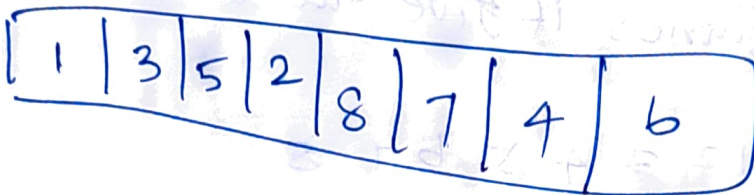
machine L = B + A

now many converted problem is

m-H 1 2 3 4 5 6 7 8
 9 12 9 7 9 12 21 13

m-H 12 16 14 12 16 11 15 15

The sequence order is



Jobs

m-A

m-B

m-C

Idle time

In out

In out

In out

A B C

1

0

3

5

2

8

7

4

6

m jobs n machines problems

solve the following sequencing problem of jobs on 6 machines in the order $m_1, m_2, m_3, m_4, m_5, m_6$ processing times are given below.

Jobs	A	B	C	D
m-1	18	17	11	20
m-2	8	6	5	9
m-3	7	9	4	3
m-4	2	6	5	9
m-5	10	8	7	8
m-6	25	19	15	12

Solution.

minimum of $m_1 = 11$

minimum of $m_6 = 12$

maximum of $m_2, m_3, m_4, m_5 = 10$

minimum of $m_1 \geq \text{maximum of } (m_2, m_3, m_4, m_5)$

(or)

minimum of $m_6 \geq \text{maximum of } (m_2, m_3, m_4, m_5)$

$$1) : m_1 + m_2 + m_3 + m_4 + m_5$$

$$2) : m_2 + m_3 + m_4 + m_5 + m_6$$

Jobs 45 46 36 39

52 48 40 31

sequence order is

CA | B | D

[illegible]

46 89 85 95 79 41

Total minimized Elapsed time = 112 hrs

Idle time

$$m_1 = 46, m_2 = 89, m_3 = 85, m_4 = 95,$$

$$m_5 = 79, m_6 = 41.$$

2 jobs are processed on 4 machines A B C D
The technological order of these jobs on
machines are as follows.

Job 1 A B C D

Job 2 D B A C

Processing times are given in the following
table

machines	A	B	C	D
Job 1	4	6	7	3 = 20
Job 2	4	7	5	8 = 24

Total elapsed time

$$20 + 6 = 26 \text{ hrs.}$$

There are 2 jobs to be processed through
4 machines A B C D. The prescribed
technological orders are

Job 1	A	B	C	D
Job 2	D	B	A	C

Processing times are

machines	A	B	C	D	
Job 1	2	4	5	1	= 12
Job 2	6	4	2	3	= 15