24Fall MGCR372-001

Operation Management HW1

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Problem 1.

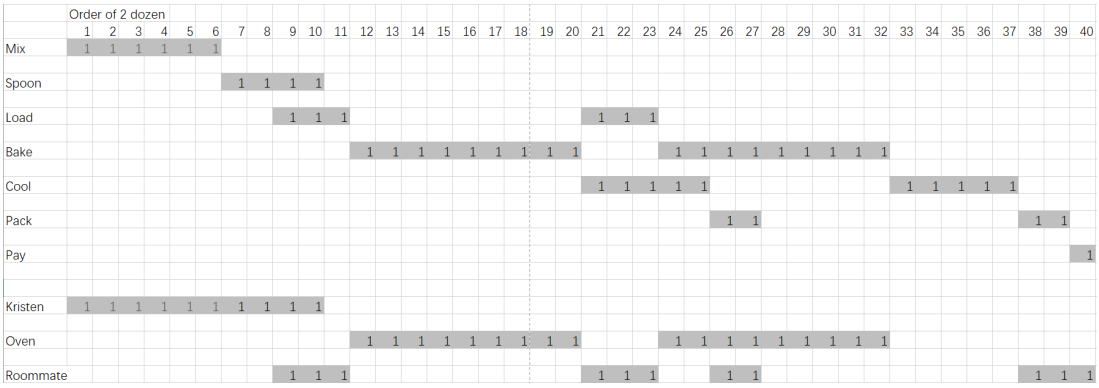

Figure 1: Gantt Chart

From the Gantt Chart, the minimum amount of time to complete a rush order of 2 is **40 minutes**.

Problem 2.

(a)

Resources	Number available	Acticities where needed	Time required per bike	Capacity
Jeff	1	Handlebars	2 min	30 bikes/hour
Anna	1	Frames & Kickstand	6+2=8 min	7.5 bikes/hour
Paul	1	Wheels	3 min	20 bikes/hour

Table 1: Capacity Analysis

(b)
Anna is the bottleneck. The capacity of the process is **7.5 bikes/hour**
(c)

$$\text{Utilization of resource} = \frac{\text{Throughput rate of resource}}{\text{Capacity of the resource}}$$

Jeff:

$$U_{Jeff} = \frac{7.5}{30} = 0.25$$

Anna:

$$U_{Anna} = 1$$

Paul:

$$U_{Paul} = \frac{7.5}{20} = 0.375$$

(d) Ignoring production of the first bike, 7.5 bikes are produced in an hour. Jeff's average working time per hour is $0.25 \times 1hour = 0.25hour$. Anna's average working time per hour is $1 \times 1hour = 1hour$. Paul's average working time per hour is $0.375 \times 1hour = 0.375hour$

$$Total\ cost\ per\ hour = 60\$ \times 7.5 + 20\$ \times 0.25 + 30\$ \times 1 + 16\$ \times 0.375 = 491\$$$

$$Profit\ per\ hour = 1500\$ - 491\$ = 1009\$$$