

### Problems Section

Note: This section has various problems that can be formulated and solved using QuantMethods Production/Operations Management software (QMpom). The appropriate model categories are indicated for each problem.

- 1 Seven jobs will be in the shop next week. The demand in units for each job (called  $d_j$ ) and the production rates of the standard operator in pieces per standard operator hour for each type of job (called  $PR_j$ ) are given as follows:

Job	A	B	C	D	E	F	G
$d_j$	600	1,000	500	50	2,000	20	800
$PR_j$	60	20	25	10	40	2	40

What production capacity is required to complete all of these jobs? (Use standard operator hours.)

Using the QMpom module called Production Scheduling (Shortest Processing Time [SPT]) will provide some useful insights concerning the best sequence for completing the work in Problem 1.

- 2 Six service calls are on hand for next week. The number of steps required for each has been determined and is listed as  $d_j$ . The supervisor is designated as the standard operator. Her output rates are labeled as  $PR_j$ . They are measured in steps per standard operator hour for each type of job.

Job	A	B	C	D	E	F
$d_j$	500	400	200	150	2,000	48
$PR_j$	100	20	25	75	400	12

What workforce capacity in standard operator hours is needed to complete all service calls?

- 3 It has been estimated that annual demand for five types of soup made by The Big Soup Company are as follows:

Soup	A	B	C	D	E
$d_j$	900	630	240	1800	1,200

*Problem 3 is continued on to this page.*

There are three plants located in the United States. The most productive plant has been chosen as the standard plant. Its output is listed in standard plant output per day.

$PR_j$	6	7	2	10	25
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The other two plants have indexes of 0.9 and 0.7. There are 250 working days in the year, and all numbers are given in thousands of cases. Is it likely that the three plants can handle the annual demand?

- 4 Using the information in Problem 3, assume that the two other plants have indexes of 0.8 and 0.7. Is it likely that the three plants can handle the annual demand?
- 5 Complete Table 13-9 for the 6-month period shown. What kind of aggregate planning policy is this?

$T$	$S_t$	$P_t$	$I_t$	$\Sigma I_t$	$W_t$	$W_t - W_{t-1}$
1	340	380			38	0
2	420	380			38	0
3	350	380			38	0
4	390	380			38	0
5	360	380			38	0
6	420	380			38	0

**Table 13-9**  
An Alternative Workforce Pattern

Compare the results obtained by completing Table 13-9 in Problem 5 with the results obtained from Table 13-5 in the