

Aggregate planning - business optimization

Business and economics

Demand	Q1	Q2	Q3	Q4
OCT2.0A	2745	3216	2700	3256
OCT2.0B	2534	2144	3300	2664

Selling price	Q1	Q2	Q3	Q4
OCT2.0A	\$ 4,085	\$ 4,214	\$ 4,515	\$ 4,300
OCT2.0B	\$ 4,275	\$ 4,410	\$ 4,725	\$ 4,500

Material cost/unit	Q1	Q2	Q3	Q4
OCT2.0A	950	980	1050	1000
OCT2.0B	855	882	945	900

Labor hrs/unit	Q1	Q2	Q3	Q4
OCT2.0A	9.7	9.7	9.7	9.7
OCT2.0B	11.0	11.0	11.0	11.0

labor rate/hr	Q1	Q2	Q3	Q4
OCT2.0A	\$55	\$58	\$58	\$60
OCT2.0B	\$55	\$58	\$58	\$60

Total labor/unit	Q1	Q2	Q3	Q4
OCT2.0A	\$534	\$560	\$560	\$582
OCT2.0B	\$605	\$635	\$635	\$659

Total unit cost	Q1	Q2	Q3	Q4
OCT2.0A	\$1,484	\$1,540	\$1,610	\$1,582
OCT2.0B	\$1,460	\$1,517	\$1,580	\$1,559

Inventory cost	Q1	Q2	Q3	Q4
OCT2.0A	\$22	\$24	\$25	\$26
OCT2.0B	\$22	\$24	\$25	\$26

Constraints

Production capacity

Q1	Q2	Q3	Q4
5462	6325	5462	6325

Labor hrs capacity

Q1	Q2	Q3	Q4
62370	56430	65340	58212

Inventory requirements

Min	Q1	Q2	Q3	Q4
OCT2.0A	200	200	200	200
OCT2.0B	200	200	200	200

Max	Q1	Q2	Q3	Q4
OCT2.0A	1000	1000	1000	1000
OCT2.0B	1000	1000	1000	1000

Production planning model

Beginning inventory	Q1	Q2	Q3	Q4
OCT2.0A	500	200	1000	200
OCT2.0B	400	883	327	444

Unit produced	Q1	Q2	Q3	Q4
OCT2.0A	2445	4016	1900	3256
OCT2.0B	3017	1588	3417	2420
Total	5462	5604	5317	5676
Capacity constraints	<=	<=	<=	<=
	5462	6325	5462	6325

Labor	Q1	Q2	Q3	Q4
OCT2.0A	23716.5	38955.2	18430	31583.2
OCT2.0B	33187	17468	37587	26620
Total	56903.5	56423.2	56017	58203.2
Labor Constraints	<=	<=	<=	<=
	62370	56430	65340	58212

Units demanded	Q1	Q2	Q3	Q4
OCT2.0A	2745	3216	2700	3256
OCT2.0B	2534	2144	3300	2664

Ending inventory	Q1	Q2	Q3	Q4
OCT2.0A	200	1000	200	200
OCT2.0B	883	327	444	200
Inventory constraints	>=	>=	>=	>=
OCT2.0A	200	200	200	200
OCT2.0B	200	200	200	200
	<=	<=	<=	<=
OCT2.0A	1000	1000	1000	1000
OCT2.0B	1000	1000	1000	1000

Quarterly production cost	Q1	Q2	Q3	Q4
OCT2.0A	\$3,627,158	\$6,185,343	\$3,059,333	\$5,149,413
OCT2.0B	\$4,404,820	\$2,409,393	\$5,399,714	\$3,773,869
				Subtotal

Quarterly inventory cost	Q1	Q2	Q3	Q4
OCT2.0A	\$7,788.38	\$14,554.65	\$15,216.15	\$5,171.55
OCT2.0B	\$14,274.98	\$14,675.94	\$9,776.38	\$8,326.20
				Subtotal

Quarterly total cost	Q1	Q2	Q3	Q4
OCT2.0A	\$3,634,945.88	\$6,199,897.45	\$3,074,548.65	\$5,154,584.39
OCT2.0B	\$4,419,094.98	\$2,424,068.94	\$5,409,490.63	\$3,782,195.20
				Total

Quarterly revenue	Q1	Q2	Q3	Q4
OCT2.0A	\$ 11,213,325	\$ 13,552,224	\$ 12,190,500	\$ 14,000,800
OCT2.0B	\$ 10,832,850	\$ 9,455,040	\$ 15,592,500	\$ 11,988,000
				Total

Quarter profit	Q1	Q2	Q3	Q4
OCT2.0A	\$ 7,578,379	\$ 7,352,327	\$ 9,115,951	\$ 8,846,216
OCT2.0B	\$ 6,413,755	\$ 7,030,971	\$ 10,183,009	\$ 8,205,805
				Total

Total	
	11917
	10642

Average	
\$	4,279
\$	4,478

Average	
\$	995
\$	896

Average	
	9.7
	11.0

Average	
\$	58
\$	58

Average	
	\$559
	\$634

Average	
\$	1,554
\$	1,529

Average	
\$	24
\$	24

Total	
	23574

Total	
	242352

Q1
200
200

Total
11617
10442
22059
<=
23574

Total
112684.9
114862
227546.9
<=
242352

Total
11917
10642

Subtotal
\$18,021,246
\$15,987,796
\$34,009,042

Subtotal
\$42,731
\$47,054
\$89,784

Subtotal
\$18,063,976
\$16,034,850
\$34,098,826

Subtotal
\$50,956,849
\$47,868,390
\$98,825,239

Subtotal
\$ 32,892,873
\$ 31,833,540
\$ 64,726,413

LP approach to Aggregate planning

Business and economics

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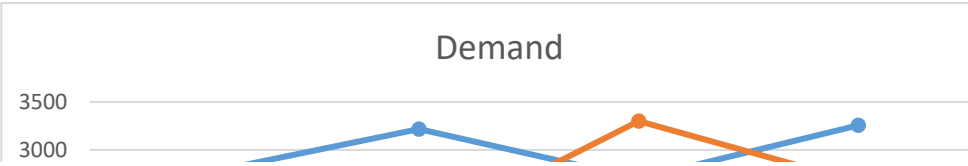
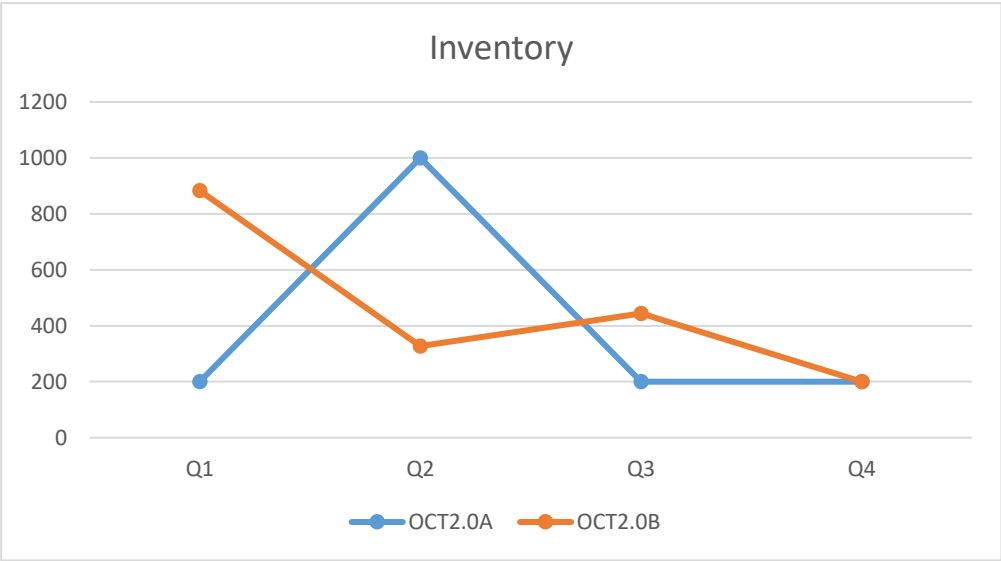
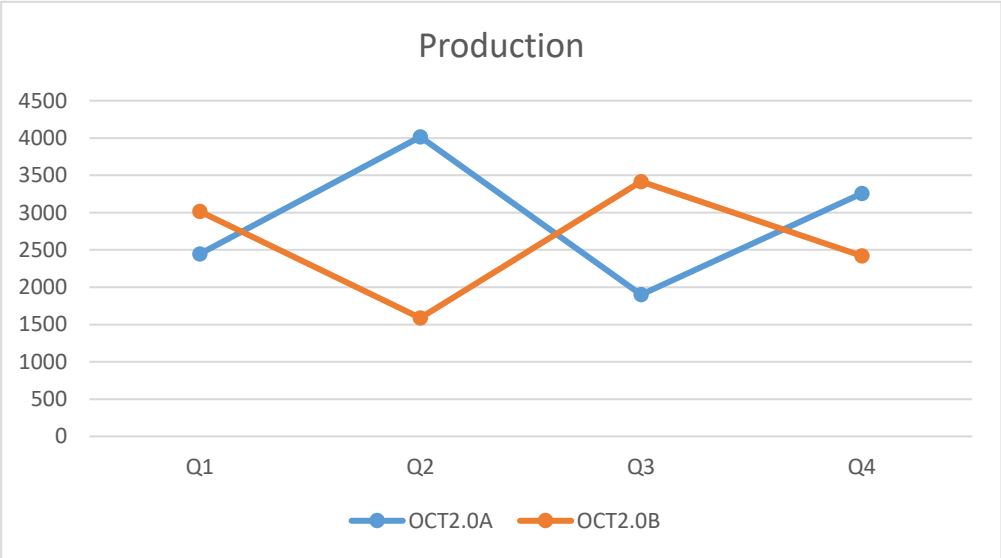
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