

milkem

	A	B	C	D	E	F	G
1	Problem 5.4 -- "Boris Milkem"						
2							
3	Data on selling prices of assets (in \$millions)						
4		Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6
5	Sold in year 1	15	16	22	10	17	19
6	Sold in year 2	20	18	30	20	19	25
7	Sold in year 3	24	21	36	30	22	29
8							
9	Selling strategy (1 if sold in a given year, 0 if not)						
10		Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6
11	Sold in year 1	0	0	0	0	0	0
12	Sold in year 2	0	0	0	0	0	0
13	Sold in year 3	0	0	0	0	0	0
14	Sum	0	0	0	0	0	0
15		<=	<=	<=	<=	<=	<=
16	Required	1	1	1	1	1	1
17							
18	Cash flow constraints						
19		Obtained		Required			
20	Year 1	0	>=	20			
21	Year 2	0	>=	30			
22	Year 3	0	>=	35			
23							
24	Total revenue	\$0					

Values

	A	B	C	D	E	F	G	H
1	Problem 5.4 --							
2								
3	Data on selling							
4		Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6	
5	Sold in year 1	15	16	22	10	17	19	
6	Sold in year 2	20	18	30	20	19	25	
7	Sold in year 3	24	21	36	30	22	29	
8								
9	Selling strategy							
10		Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6	
11	Sold in year 1	0	1	0	0	1	0	
12	Sold in year 2	0	0	1	0	0	0	
13	Sold in year 3	1	0	-4.61256873622589E-16	1	0	1	
14	Sum	=SUM(B11:B13)	=SUM(C11:C13)	=SUM(D11:D13)	=SUM(E11:E13)	=SUM(F11:F13)	=SUM(G11:G13)	
15			<=	<=	<=	<=	<=	
16	Required	1	1	1	1	1	1	Constraints
17								
18	Cash flow cons							
19		Obtained		Required				
20	Year 1	=SUMPRODUCT(B11:G11,B5:G5)	>=	20		Decision Variables, Binary		
21	Year 2	=SUMPRODUCT(B12:G12,B6:G6)	>=	30				
22	Year 3	=SUMPRODUCT(B13:G13,B7:G7)	>=	35				
23								
24	Total revenue	=SUMPRODUCT(B5:G7,B11:G13)						
25								
26								
27								

55 (Based on Boykin [3]) Monsanto annually produces 359 million pounds of the chemical maleic anhydride. A total of four reactors are available to produce maleic anhydride. Each reactor can be run on one of three settings. The cost (in thousands of dollars) and pounds produced (in millions) annually for each reactor and each setting are given in Table 5.63. A reactor can only be run on one setting for the entire year. Determine how Monsanto can minimize the cost of meeting its annual demand for maleic anhydride.

TABLE 5.63 Data for Monsanto Problem

	Setting	Cost	Pounds
Reactor 1	1	50	80
	2	80	140
	3	100	170
Reactor 2	1	65	100
	2	90	140
	3	120	215
Reactor 3	1	70	112
	2	90	153
	3	110	195
Reactor 4	1	40	65
	2	60	105
	3	70	130