



Case 3 Solver Analysis

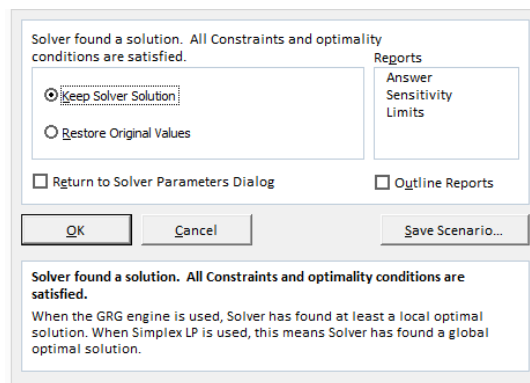
Task 1:
Remembering
how to use
Solver. Solve the LP on the right using Excel Solver.

Solve the LP

$$\begin{aligned} \text{Max } z &= 4x_1 + 3x_2 + 2x_3 + 3x_4 \\ x_1 + x_2 + x_3 + x_4 &\leq 21 \\ 2x_1 + 2x_2 - 2x_3 &\leq 18 \\ x_1 - 4x_2 &+ 2x_4 \leq 15 \\ x_1, x_2, x_3, x_4 &\geq 0 \end{aligned}$$

Task 2. Dual
Price and
Sensitivity
Analysis.

To aid in the analysis of the problem click the sensitivity and limits option on the right hand side of the solver option. These reports will be shown on a different sheet in Excel.



Fill in the table below

x_1	x_2	x_3	x_4

y_1	y_2	y_3

Constraint	Allowable Decrease	Allowable Increase
1		
2		
3		

Variable	Reduced Cost	Objective Function Coefficient	Allowable Decrease	Allowable Increase
x_1				
x_2				
x_3				
x_4				

**Task 3:
Independent
Analysis**

Given this problem, answer the following questions without changing the initial LP, unless otherwise stated. Show all your solutions

(Edited Taha, 8th Edition) Top Toys is planning a new radio and TV advertising campaign. A radio commercial costs \$300 and a TV ad costs \$2000. A total budget of \$20,000 is allocated to the campaign. Each medium must have at least five commercials each, and the company must have at least 35 commercials in total. By Law they only have a total of 30 minutes airtime. Each radio commercial is 30 seconds long and each TV ad is 45 seconds long. It is estimated that the first radio commercial will reach 5000 people, with each additional commercial reaching only 2000 new ones. For TV, the first ad will reach 45000 people and each additional ad an additional 3000. How should the budget amount be allocated between radio and TV?

1. If the budget is increased to \$25,000, what will be the new maximum audience reach of the commercials?
2. Will the number of produced commercials change when there is only 20 minutes allowed air time?
3. What will be the new optimal values after the change in Question 2? You may use Excel Solver
4. If the number of audience reached for a new TV commercial is increased to 5000, what will be the new optimal solution? You may use Excel Solver

**Task 4:
Individual
Solving**

Given below is a problem from laboratory 1. In class you were taught a more efficient way to solve this problem. Using Excel Solver give the optimal solution.

Mode of Production	Mo Capacity (in cases)	Production Cost per Case (\$)
Regular	5,000	10
Overtime	500	16
Subcontracting	n/a	20
Holding Cost Per Month		\$1

Nowjuice, Inc. produces bottled juice. A planner has developed an aggregate forecast for demand (in cases) for the next six months. Develop a least-cost aggregate plan using the following information. Assume zero (0) beginning inventory.

Month	May	June	July	Aug	Sep	Oct
Forecast	4,000	4,800	5,600	7,200	6,400	5,000

What is the Optimal Production Plan?