LP Solution with Excel Solver:

In Excel Solver, the spreadsheet is the input and output medium for the LP. We use the following steps to formulate the following model in Excel:
LP model:

$$\begin{aligned} Maximize\ z &= 5x_1 + 4x_2 \\ subject\ to, \quad 6x_1 + 4x_2 &\le 24 \\ x_1 + 2x_2 &\le 6 \\ -x_1 + x_2 &\le 1 \\ x_2 &\le 2 \\ x_1, x_2 &\ge 0 \end{aligned}$$

Step 1. Constraints data are entered first in the worksheet.
Cell B5:C5 shows the coefficient of the variables for the first constraint. Similarly, B6:C6, B7:C7 and B8:C8 shows the coefficient of the variables for the second, third and fourth constraints, respectively. B9:C9 shows the profit per unit of the products. Cell D5:D8 indicates the right-hand side values (resource amount) of the constraints. Cell E5:E7 indicates the type of the constraints.

Step 2. Cell locations for decision variables are specified. Cells B12 and C12 are earmarked for decision variables.

Step 3. Objective function data of maximization is entered below the constraints data, and a formula for computing the objective function is created in a cell. Cell B13 would give the final value of maximum profit earned, i.e. the objective function. For its calculation, a formula has to be created which is the sum of product of profit per unit from each product and the number of units sold. Hence the formula for it is **Cell B13: = B9*B12 + C9*C12** OR one can use SUMPRODUCT function available in the excel spreadsheet as the following **Cell B13:=SUMPRODUCT(B9:C9,$B$12:$C$12).**

Step 4. The formula for computing the left side of the constraints are formulated in Cell B14:B17. The formulas are as follows:
Cell B14:=SUMPRODUCT(B5:C5,$B$12:$C$12),
Cell B15:=SUMPRODUCT(B6:C6,$B$12:$C$12),
Cell B16:=SUMPRODUCT(B7:C7,$B$12:$C$12),
Cell B17:=SUMPRODUCT(B8:C8,$B$12:$C$12)

	A	B	C	D	E
2	**Problem Data**				
3		Tons of raw material per ton			
4		Exterior paint	Interior paint	Total	Type of the Constraint
5	Raw material,	6	4	24	<=
6	Raw material,	1	2	6	<=
7	Market limit	-1	1	1	<=
8	Demand	0	1	2	<=
9	Profit per ton ($1000)	5	4		
10	**Solution**				
11		Amount of Exterior paint Produced	Amount of Interior paint		
12	Decision Variables	0	0		
13	Optimal Profit	0			
14	Raw Material Constraint 1	0			
15	Raw Material Constraint 2	0			
16	Market limit Constraint	0			
17	Demand Constraint	0			

In Microsoft Excel, after entering entire linear programming data in the worksheet, the following steps would lead to a solution:

Step 1. Select Data menu in the toolbar.

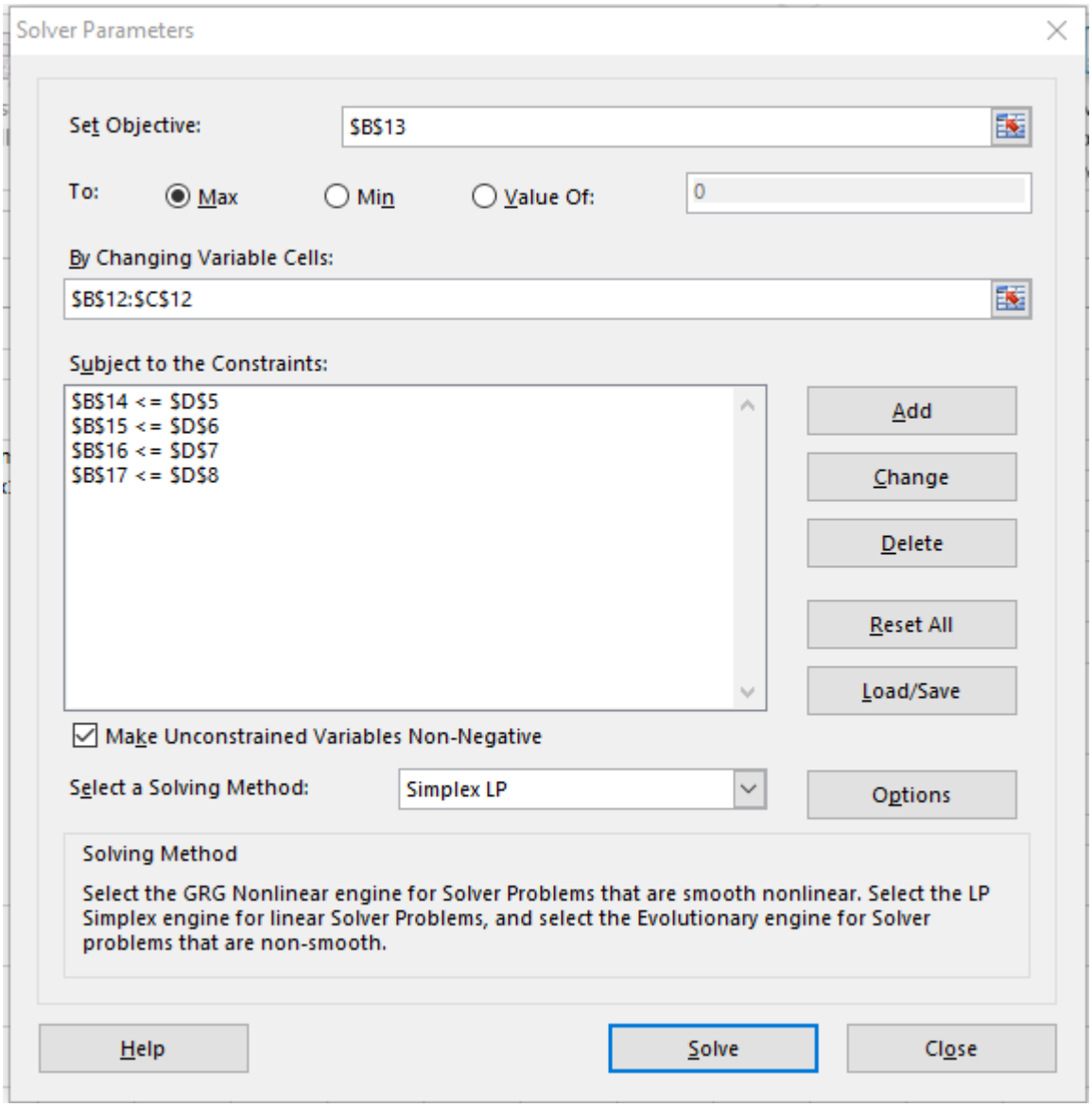
Step 2. In Data menu, select Solver application.

Step 3. Open Solver application. In Solver parameters dialog box Enter B13 in set target cell. Select purpose of max (depending on the type of the objective). Enter B12:C12 in by changing cell box. To enter constraint equations, click on Add button.

Step 4. When the Add constraint dialog box opens, it would have three boxes: first, cell reference; second, inequalities of ≤ and lastly, constraint box. For first constraint, enter B14 in cell reference box; enter inequality of ≤ and D5 in the constraint box. Then click on Add to add more constraints. To include the other constraints use the similar procedure. After entering all constraints, click OK.

Step 5. Now choose Options. Select Assume Non-Negative and Assume Linear Model (in MS Excel 2007). In Excel 2010 onwards, select Make Unconstraint Variables Non-negative and select Simplex LP from the dropdown menu of Select a Solving Method. Click OK.

Step 6. When Solver parameters dialog box appear, click on Solve.



Step 7. Finally, when final solution appears on the worksheet, select Keep Solver Solution and click OK.

Step 8. If a problem has no feasible solution, Solver will issue the explicit message “Solver could not find a feasible solution”. If the optimal objective value is unbounded (not finite), Solver will issue the somewhat ambiguous message “The Set Cell values do not converge”. In either case, the message indicates that there is something wrong with the formulation of the model.