

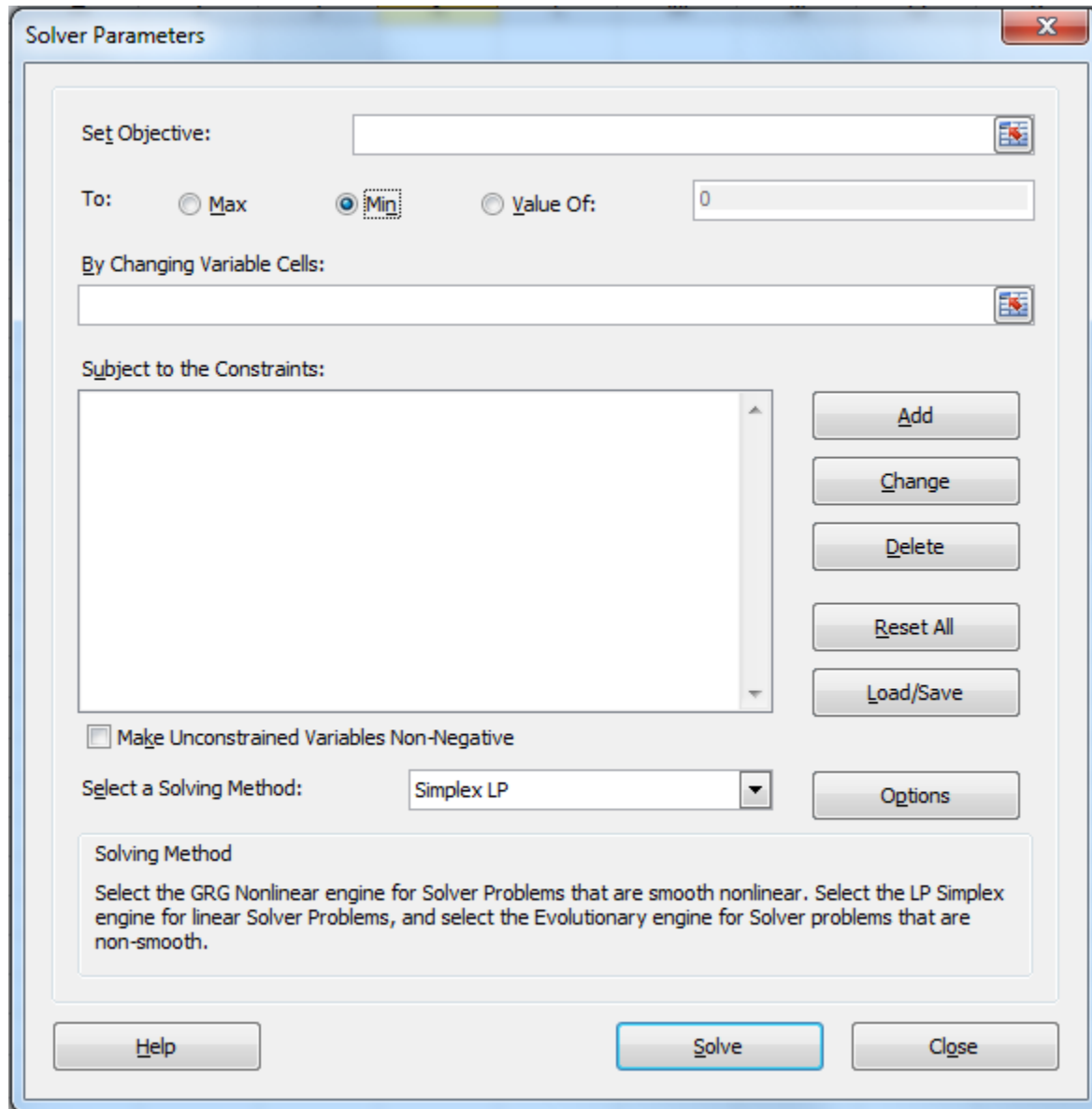
Example: Mixing Drinks at Club Fever

We are asked by Club Fever to come up with the optimal plan to mix drinks for a Thursday night. Excel file “Mixing Drinks.xlsx”

Set up the Mixing Drinks model in Excel for Solver:

	A	B	C	D	E	F
1	Mixing Drinks					
2						Notes: Recipe (1 cup = 6 ounces)
3	Monetary inputs	Sex on the Beach	Cosmopolitan			1 Cup of Sex on the Beach
4	Selling price/cup	\$5.00	\$7.00			>= 1 ounce of Vodka
5						>= 1 ounce of Peach Schnapps
6	Alcohol percentage of ingredients					>= 1 ounce of Fruit Juice
7	Vodka	0.40				1 Cup of Cosmopolitan
8	Peach Schnapps	0.21				>= 1 ounce of Vodka
9	Triple Sec	0.30				>= 1 ounce of Triple Sec
10	Fruit Juice	0.00				>= 1 ounce of Fruit Juice
11						
12	Required alcohol percentage					
13		Sex on the Beach	Cosmopolitan			
14		0.12	0.30			
15						
16	Blending plan					
17		Sex on the Beach	Cosmopolitan	Ounces used		Available ingredients (ounces)
18	Vodka					1200
19	Peach Schnapps					600
20	Triple Sec					500
21	Fruit Juice					3000
22	Ounces produced					
23	Cups sold					
24						
25	Constraints on alcohol percentage					
26		Sex on the Beach	Cosmopolitan			
27	Alcohol obtained (ounces)					
28						
29	Alcohol required (ounces)					
30						
31	Objective to maximize					
32	Revenue					

Entering the Mixing Drinks model into Solver:



The image shows the "Solver Parameters" dialog box in Microsoft Excel. The dialog box has a title bar with a close button (X). The main area contains the following fields and controls:

- Set Objective:** A text box for the objective cell, with a small icon to its right.
- To:** Three radio buttons: ☐ Max, ☒ Min, and ☐ Value Of: (which is followed by a text box containing the number 0).
- By Changing Variable Cells:** A text box for the variable cells, with a small icon to its right.
- Subject to the Constraints:** A large list box for constraints, with a vertical scrollbar on its right side.
- Buttons:** To the right of the constraints list box are five buttons: "Add", "Change", "Delete", "Reset All", and "Load/Save".
- Make Unconstrained Variables Non-Negative:** A checkbox that is currently unchecked.
- Select a Solving Method:** A dropdown menu currently showing "Simplex LP".
- Options:** A button located to the right of the "Select a Solving Method" dropdown.
- Solving Method:** A text box containing the following text: "Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth."
- Bottom Buttons:** At the bottom of the dialog box are three buttons: "Help", "Solve", and "Close".

Solution to the Mixing Drinks model:

	A	B	C	D	E	F
1	Mixing Drinks					
2						Notes: Recipe (1 cup = 6 ounces)
3	Monetary inputs	Sex on the Beach	Cosmopolitan			1 Cup of Sex on the Beach
4	Selling price/cup	\$5.00	\$7.00			>= 1 ounce of Vodka
5						>= 1 ounce of Peach Schnapps
6	Alcohol percentage of ingredients					>= 1 ounce of Fruit Juice
7	Vodka	0.40				1 Cup of Cosmopolitan
8	Peach Schnapps	0.21				>= 1 ounce of Vodka
9	Triple Sec	0.30				>= 1 ounce of Triple Sec
10	Fruit Juice	0.00				>= 1 ounce of Fruit Juice
11						
12	Required alcohol percentage					
13		Sex on the Beach	Cosmopolitan			
14		0.12	0.30			
15						
16	Blending plan					
17		Sex on the Beach	Cosmopolitan	Ounces used		Available ingredients (ounces)
18	Vodka	765	435	1200	<=	1200
19	Peach Schnapps	600	0	600	<=	600
20	Triple Sec	0	290	290	<=	500
21	Fruit Juice	2235	145	2380	<=	3000
22	Ounces produced	3600	870			
23	Cups sold	600	145			
24						
25	Constraints on alcohol percentage					
26		Sex on the Beach	Cosmopolitan			
27	Alcohol obtained (ounces)	432	261			
28		>=	>=			
29	Alcohol required (ounces)	432	261			
30						
31	Objective to maximize					
32	Revenue	4,015				

Questions:

1. With the above optimal mixing, Club Fever will obtain a revenue of \$_____.
2. If Club Fever need to produce at least 200 cups of Cosmopolitan, how should we modify the model? How would the revenue change as a result of this modification?
3. Based on the original model, how much is Club Fever willing to pay for 2 additional handles (60 ounces each) of Peach Schnapps?