Example: Advertising

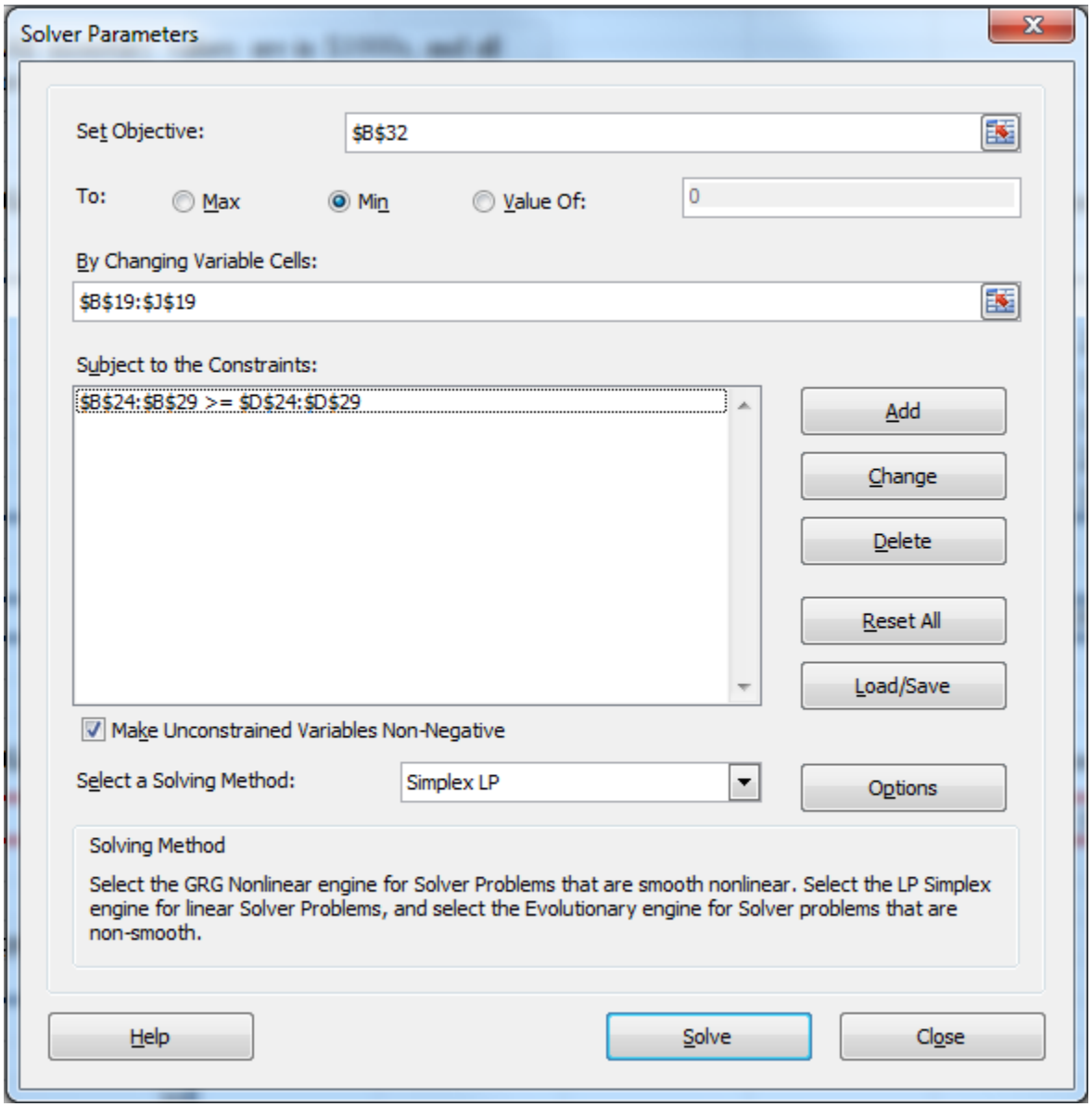
One way to set up the Chery advertising model in Excel for Solver:

	A	B	C	D	E	F	G	H	I	J
1	**Advertising model**									
2				**Note:** All monetary values are in $1000s, and all exposures to ads are in millions of exposures.						
3	**Inputs**									
4	Exposures to various groups per ad									
5		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
6	channel	CBS	FOX	CW	FOX	CBS	ABC	CBS	NBC	CBS
7	Men 18-35	4.5	4.0	0.2	2.5	2.0	2.0	3.5	1.0	4.0
8	Men 36-55	2.0	3.0	0.1	1.5	1.5	1.5	3.5	2.5	3.0
9	Men >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
10	Women 18-35	4.5	1.5	1.5	3.5	2.0	2.0	2.0	1.0	3.0
11	Women 36-55	2.0	1.5	0.2	1.5	1.5	1.5	3.0	2.5	3.0
12	Women >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
13	**Viewers (millions)**	14	11	2	10	9	9	16	9	15
14										
15	**Cost per 30 sec($)**	192	108	59	127	145	130	167	191	201
16										
17	**Advertising plan**									
18		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
19	Number ads purchased									
20										
21	**Constraints on numbers of exposures**									
22		Actual exposures		Required exposures						
23				by Chery						
24	Men 18-35	=sumproduct(B7:J7,B$19:J$19)		80						
25	Men 36-55			56						
26	Men >55		≥	30						
27	Women 18-35			120						
28	Women 36-55			56						
29	Women >55			30						
30										
31	**Objective to minimize**									
32	Total cost	=sumproduct(B15:J15,B19:J19)								

Using Solver:

- From Excel menu (typically under Data), open Solver.
- Enter objective function and variable cells.
- To enter constraints, click "Add," then enter left and right sides of constraints and type of relationship between them.
- If all variables are greater than or equal to zero, check "Make Unconstrained Variables Non-Negative."
- Select a solving method. If model is linear, select Simplex LP.
- Click "Solve," then "Keep Solver Solution."

Inputting the Advertising model into Solver:



Solution to the Advertising model:

	A	B	C	D	E	F	G	H	I	J
1	**Advertising model**									
2										
3	**Inputs**									
4	Exposures to various groups per ad									
5		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
6	channel	CBS	FOX	CW	FOX	CBS	ABC	CBS	NBC	CBS
7	Men 18-35	4.5	4.0	0.2	2.5	2.0	2.0	3.5	1.0	4.0
8	Men 36-55	2.0	3.0	0.1	1.5	1.5	1.5	3.5	2.5	3.0
9	Men >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
10	Women 18-35	4.5	1.5	1.5	3.5	2.0	2.0	2.0	1.0	3.0
11	Women 36-55	2.0	1.5	0.2	1.5	1.5	1.5	3.0	2.5	3.0
12	Women >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
13	**Viewers (millions)**	14	11	2	10	9	9	16	9	15
14										
15	**Cost per 30 sec($)**	192	108	59	127	145	130	167	191	201
16										
17	**Advertising plan**									
18		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
19	Number ads purchased	0.0	0.0	0.0	30.0	0.0	0.0	7.5	0.0	0.0
20										
21	**Constraints on numbers of exposures**									
22		Actual exposures		Required exposures						
23				by Chery						
24	Men 18-35	101.3	>=	80						
25	Men 36-55	71.3	>=	56						
26	Men >55	30.0	>=	30						
27	Women 18-35	120.0	>=	120						
28	Women 36-55	67.5	>=	56						
29	Women >55	30.0	>=	30						
30										
31	**Objective to minimize**									
32	Total cost	5,062.5								

Note: All monetary values are in $1000s, and all exposures to ads are in millions of exposures.

Integer Solution to the Advertising model:

Add a constraint in Solver: B19:J19=integer

	A	B	C	D	E	F	G	H	I	J
1	**Advertising model**									
2				**Note:** All monetary values are in $1000s, and all exposures to ads are in millions of exposures.						
3	**Inputs**									
4	Exposures to various groups per ad									
5		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
6	channel	CBS	FOX	CW	FOX	CBS	ABC	CBS	NBC	CBS
7	Men 18-35	4.5	4.0	0.2	2.5	2.0	2.0	3.5	1.0	4.0
8	Men 36-55	2.0	3.0	0.1	1.5	1.5	1.5	3.5	2.5	3.0
9	Men >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
10	Women 18-35	4.5	1.5	1.5	3.5	2.0	2.0	2.0	1.0	3.0
11	Women 36-55	2.0	1.5	0.2	1.5	1.5	1.5	3.0	2.5	3.0
12	Women >55	0.5	0.5	0.0	0.5	1.0	1.0	2.0	1.0	1.0
13	**Viewers (millions)**	14	11	2	10	9	9	16	9	15
14										
15	**Cost per 30 sec($)**	192	108	59	127	145	130	167	191	201
16										
17	**Advertising plan**									
18		**The Big Bang Theory**	**Bones**	**Gossip Girl**	**Glee**	**How I Met Your Mother**	**Modern Family**	**NCIS**	**The Office**	**Two and a Half Men**
19	Number ads purchased	0.0	0.0	0.0	30.0	0.0	1.0	7.0	0.0	0.0
20										
21	**Constraints on numbers of exposures**									
22		Actual exposures		Required exposures						
23				by Chery						
24	Men 18-35	101.5	>=	80						
25	Men 36-55	71.0	>=	56						
26	Men >55	30.0	>=	30						
27	Women 18-35	121.0	>=	120						
28	Women 36-55	67.5	>=	56						
29	Women >55	30.0	>=	30						
30										
31	**Objective to minimize**									
32	Total cost	5,109								