Example: Rating College Football Teams

Set up the Rating model in Excel:

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Rating College Football Teams (2012)**				**Objective to minimize**							
2					**Sum squared errors**	=sum(L6:L685)						
3	Home game advantage											
4					**Results of games**						**Model predictions and errors**	
5	Constraint on average rating (any nominal value could be used)				Week	Home Team	Visiting Team	Home Team Score	Visiting Team Score	Point spread	Predicted spread	Squared error
6	Actual average	=average(C12:C135)			1	Akron	Central Florida	14	56	=H6-I6		=(J6-K6)^2
7		=			1	Ball State	Eastern Michigan	37	26			
8	Nominal average	85			1	Vanderbilt	South Carolina	13	17			
9					1	Rice	UCLA	24	49			
10	**Ratings of teams**				1	Connecticut	Massachusetts	37	0			
11	Team Index	Team Name	Rating		1	BYU	Washington State	30	6			
12	1	Air Force			1	UNLV	Minnesota	27	30			
13	2	Akron			1	North Carolina State	Tennessee	21	35			
14	3	Alabama			1	Michigan State	Boise State	17	13			
15	4	Arizona			1	Stanford	San Jose State	20	17			
16	5	Arizona State			1	Navy	Notre Dame	10	50			
17	6	Arkansas			1	Illinois	Western Michigan	24	7			
18	7	Arkansas State			1	Iowa State	Tulsa	38	23			
19	8	Army			1	UAB	Troy	29	39			
20	9	Auburn			1	Ohio State	Miami (Ohio)	56	10			
21	10	Ball State			1	Penn State	Ohio	14	24			
22	11	Baylor			1	Syracuse	Northwestern	41	42			
23	12	Boise State			1	West Virginia	Marshall	69	34			
	. . .											
132	121	Western Kentucky			3	Indiana	Ball State	39	41			
133	122	Western Michigan			3	Michigan State	Notre Dame	3	20			
134	123	Wisconsin			3	San Jose State	Colorado State	40	20			
135	124	Wyoming			3	LSU	Idaho	63	14			
136					3	Mississippi	Texas	31	66			
	. . .											
664					13	Southern Cal	Notre Dame	13	22			
665					13	San Jose State	Louisiana Tech	52	23			
666					13	Hawaii	UNLV	48	10			
667					14	Rutgers	Louisville	17	20			
668					14	Kent State	Northern Illinois	37	44			
669					14	Stanford	UCLA	27	24			
670					14	TCU	Oklahoma	17	24			
671					14	Baylor	Oklahoma State	41	34			
672					14	Tulsa	Central Florida	33	27			
673					14	West Virginia	Kansas	59	10			
674					14	Arkansas State	Middle Tennessee	45	0			
675					14	Florida Atlantic	Louisiana-Lafayette	21	35			
676					14	Connecticut	Cincinnati	17	34			
677					14	Nevada	Boise State	21	27			
678					14	Georgia	Alabama	28	32			
679					14	Texas State	New Mexico State	66	28			
680					14	South Florida	Pittsburgh	3	27			
681					14	Georgia Tech	Florida State	5	21			
682					14	Kansas State	Texas	42	24			
683					14	Wisconsin	Nebraska	70	31			
684					14	Hawaii	South Alabama	23	7			
685					15	Army	Navy	13	17			

=VLookup(F6,B$12:C$135,2,False)
– VLookup(G6,B$12:C$135,2,False) + B$3

Specify Solver:
Set Objective: F2

To: ○ Max X Min ○ Value of: _____
By Changing Variable Cells: C12:C135,B3
Subject to the Constraints:

B6=B8

☐ Make Unconstrained Variables Non-Negative
Select a Solving Method: GRG Nonlinear

Solver Results:

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Rating College Football Teams (2012)**				**Objective to minimize**							
2					**Sum squared errors**	105147.94						
3	Home game advantage	3.65										
4					**Results of games**						**Model predictions and errors**	
5	Constraint on average rating (any nominal value could be used)				Week	Home Team	Visiting Team	Home Team Score	Visiting Team Score	Point spread	Predicted spread	Squared error
6	Actual average	85.00			1	Akron	Central Florida	14	56	-42	-26.15	251.21
7		=			1	Ball State	Eastern Michigan	37	26	11	18.91	62.49
8	Nominal average	85			1	Vanderbilt	South Carolina	13	17	-4	-5.57	2.47
9					1	Rice	UCLA	24	49	-25	-18.39	43.67
10	**Ratings of teams**				1	Connecticut	Massachusetts	37	0	37	30.60	40.93
11	Team Index	Team Name	Rating		1	BYU	Washington State	30	6	24	24.34	0.11
12	1	Air Force	77.41		1	UNLV	Minnesota	27	30	-3	-4.74	3.03
13	2	Akron	59.52		1	North Carolina State	Tennessee	21	35	-14	-2.04	143.14
14	3	Alabama	118.45		1	Michigan State	Boise State	17	13	4	0.17	14.63
15	4	Arizona	94.34		1	Stanford	San Jose State	20	17	3	12.52	90.56
16	5	Arizona State	98.01		1	Navy	Notre Dame	10	50	-40	-22.68	299.88
17	6	Arkansas	83.70		1	Illinois	Western Michigan	24	7	17	-0.44	304.19
18	7	Arkansas State	91.23		1	Iowa State	Tulsa	38	23	15	12.65	5.54
19	8	Army	68.35		1	UAB	Troy	29	39	-10	-11.98	3.91
20	9	Auburn	80.51		1	Ohio State	Miami (Ohio)	56	10	46	36.98	81.31
21	10	Ball State	80.24		1	Penn State	Ohio	14	24	-10	22.56	1059.85
22	11	Baylor	100.14		1	Syracuse	Northwestern	41	42	-1	1.24	5.04
23	12	Boise State	94.26		1	West Virginia	Marshall	69	34	35	25.32	93.75
	. . .											
132	121	Western Kentucky	83.14		3	Indiana	Ball State	39	41	-2	1.01	9.08
133	122	Western Michigan	71.26		3	Michigan State	Notre Dame	3	20	-17	-11.94	25.64
134	123	Wisconsin	98.66		3	San Jose State	Colorado State	40	20	20	25.50	30.21
135	124	Wyoming	75.95		3	LSU	Idaho	63	14	49	52.45	11.89
136					3	Mississippi	Texas	31	66	-35	-4.32	941.25
	. . .											
664					13	Southern Cal	Notre Dame	13	22	-9	-1.16	61.45
665					13	San Jose State	Louisiana Tech	52	23	29	10.33	348.56
666					13	Hawaii	UNLV	48	10	38	-1.90	1592.02
667					14	Rutgers	Louisville	17	20	-3	5.07	65.10
668					14	Kent State	Northern Illinois	37	44	-7	-5.63	1.87
669					14	Stanford	UCLA	27	24	3	9.08	36.92
670					14	TCU	Oklahoma	17	24	-7	-8.94	3.75
671					14	Baylor	Oklahoma State	41	34	7	-1.92	79.60
672					14	Tulsa	Central Florida	33	27	6	1.80	17.66
673					14	West Virginia	Kansas	59	10	49	19.83	850.74
674					14	Arkansas State	Middle Tennessee	45	0	45	13.91	966.78
675					14	Florida Atlantic	Louisiana-Lafayette	21	35	-14	-8.74	27.64
676					14	Connecticut	Cincinnati	17	34	-17	-13.12	15.07
677					14	Nevada	Boise State	21	27	-6	-6.25	0.06
678					14	Georgia	Alabama	28	32	-4	-7.90	15.22
679					14	Texas State	New Mexico State	66	28	38	22.69	234.36
680					14	South Florida	Pittsburgh	3	27	-24	-10.56	180.75
681					14	Georgia Tech	Florida State	5	21	-16	-13.63	5.61
682					14	Kansas State	Texas	42	24	18	13.33	21.77
683					14	Wisconsin	Nebraska	70	31	39	8.24	946.03
684					14	Hawaii	South Alabama	23	7	16	-0.74	280.08
685					15	Army	Navy	13	17	-4	-8.04	16.35

The procedure used in this example is practically identical to the procedure used in the Jeff Sagarin NCAA football ratings, which is one of the six computer rankings used in calculating the BCS Average.

Two main reasons that our rating results are different from the real Jeff Sagarin NCAA football rating results submitted to BCS.

- In the real Jeff Sagarin NCAA football ratings, both Division I FBS and Division I FCS teams are considered, i.e., 246 teams instead of 124 teams are considered.
- In the real Jeff Sagarin NCAA football ratings, only winning and losing matters, i.e., the score margin is of no consequence, which makes it very "politically correct".

Find out more about the Jeff Sagarin NCAA football ratings at
http://usatoday30.usatoday.com/sports/sagarin/fbt12.htm