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$$\text{Max } .15Y_1 + .25Y_2 + .08Y_3 + .10Y_4 + .20Y_5 + .05Y_6 + .17Y_7$$

s.t.

$$5l_{11} + 26l_{12} + 20l_{13} + 18l_{14} + 11l_{15} + 17l_{16} + 10l_{17} - 50Y_1 \geq 1$$

$$18l_{21} + 11l_{22} + 5l_{23} + 12l_{24} + 16l_{25} + 15l_{26} + 26l_{27} - 50Y_2 \geq 1$$

$$4l_{31} + 16l_{32} + 22l_{33} + 7l_{34} + 13l_{35} + 11l_{36} + 19l_{37} - 50Y_3 \geq 1$$

$$12l_{41} + 8l_{42} + 4l_{43} + 18l_{44} + 9l_{45} + 22l_{46} + 14l_{47} - 50Y_4 \geq 1$$

$$19l_{51} + 9l_{52} + 3l_{53} + 4l_{54} + 14l_{55} + 30l_{56} + 19l_{57} - 50Y_5 \geq 1$$

$$6l_{61} + 15l_{62} + 21l_{63} + 8l_{64} + 17l_{65} + 20l_{66} + 11l_{67} - 50Y_6 \geq 1$$

$$9l_{71} + 6l_{72} + 3l_{73} + 13l_{74} + 5l_{75} + 16l_{76} + 28l_{77} - 50Y_7 \geq 1$$

$$l_{11} + l_{12} + l_{13} = 1$$

*Done
for each
public issue
for each group

$$l_{14} + l_{15} = 1$$

$$l_{16} + l_{17} = 1$$

Y_k variable = 1 if group supports party platform, 0 if group does not support the party platform.

l_{ij} variable = 1 if category is chosen, 0 if category is not chosen.

$$l_{11} - l_{21} = 0$$

$$l_{11} - l_{31} = 0$$

...

Done for each solution to a given issue to ensure that the same value is carried in each group's row.

Results Analysis:

The model that was developed for this example was concerned with the stances that should be taken by a political party in order to secure as much of the vote as possible. The objective function dictated these matters by containing the percentage of the voting public that each group represented. The three topics on which this would be tested were tax policies, social concerns, and entitlements. One option could be chosen from each heading in order to bring about the most votes in the party's favor. After running a very complex problem through Solver, we were given the results that would maximize the percent of voters that would vote for this political party with respect to a multitude of constraints. From these results, it would be recommended that the party run on the ideas of no taxation, support for social concerns, and reduce entitlement programs. If this is done, the candidate should attract 45% of the voting public to want to pick him for office. This is because by making these choices, the candidate has the full support of the fiscal conservatives and retirees, which make up the largest percentage of all voters.

Microsoft Excel 14.0 Answer Report

Worksheet: [Political Party Platform.xlsx]Sheet1

Report Created: 11/19/2012 1:50:20 PM

Result: Solver found a solution. All Constraints and optimality conditions are satisfied.

Solver Engine

Engine: Simplex LP

Solution Time: 0.203 Seconds.

Iterations: 10 Subproblems: 46

Solver Options

Max Time Unlimited, Iterations Unlimited, Precision 0.000001, Use Automatic Scaling

Max Subproblems Unlimited, Max Integer Sols Unlimited, Integer Tolerance 1%, Assume NonNegative

Objective Cell (Max)

Cell	Name	Original Value	Final Value
\$B\$17	Optimal Liberals	0.45	0.45

Variable Cells

Cell	Name	Original Value	Final Value	Integer
\$A\$21	Y1	0	0	Binary
\$B\$21	Y2	1	1	Binary
\$C\$21	Y3	0	0	Binary
\$D\$21	Y4	0	0	Binary
\$E\$21	Y5	1	1	Binary
\$F\$21	Y6	0	0	Binary
\$G\$21	Y7	0	0	Binary
\$H\$21	I11	1	1	Binary
\$A\$23	I12	0	0	Binary
\$B\$23	I13	0	0	Binary
\$C\$23	I14	0	0	Binary
\$D\$23	I15	1	1	Binary
\$E\$23	I16	0	0	Binary
\$F\$23	I17	1	1	Binary
\$G\$23	I21	1	1	Binary
\$H\$23	I22	0	0	Binary
\$A\$25	I23	0	0	Binary
\$B\$25	I24	0	0	Binary
\$C\$25	I25	1	1	Binary
\$D\$25	I26	0	0	Binary
\$E\$25	I27	1	1	Binary
\$F\$25	I31	1	1	Binary
\$G\$25	I32	0	0	Binary
\$H\$25	I33	0	0	Binary
\$A\$27	I34	0	0	Binary
\$B\$27	I35	1	1	Binary

\$C\$27	I36	0	0 Binary
\$D\$27	I37	1	1 Binary
\$E\$27	I41	1	1 Binary
\$F\$27	I42	0	0 Binary
\$G\$27	I43	0	0 Binary
\$H\$27	I44	0	0 Binary
\$A\$29	I45	1	1 Binary
\$B\$29	I46	0	0 Binary
\$C\$29	I47	1	1 Binary
\$D\$29	I51	1	1 Binary
\$E\$29	I52	0	0 Binary
\$F\$29	I53	0	0 Binary
\$G\$29	I54	0	0 Binary
\$H\$29	I55	1	1 Binary
\$A\$31	I56	0	0 Binary
\$B\$31	I57	1	1 Binary
\$C\$31	I61	1	1 Binary
\$D\$31	I62	0	0 Binary
\$E\$31	I63	0	0 Binary
\$F\$31	I64	0	0 Binary
\$G\$31	I65	1	1 Binary
\$H\$31	I66	0	0 Binary
\$A\$33	I67	1	1 Binary
\$B\$33	I71	1	1 Binary
\$C\$33	I72	0	0 Binary
\$D\$33	I73	0	0 Binary
\$E\$33	I74	0	0 Binary
\$F\$33	I75	1	1 Binary
\$G\$33	I76	0	0 Binary
\$H\$33	I77	1	1 Binary

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$A\$36	Constraints:	26	\$A\$36>=\$C\$36	Not Binding	25
\$A\$37	Constraints:	10	\$A\$37>=\$C\$37	Not Binding	9
\$A\$38	Constraints:	36	\$A\$38>=\$C\$38	Not Binding	35
\$A\$39	Constraints:	35	\$A\$39>=\$C\$39	Not Binding	34
\$A\$40	Constraints:	2	\$A\$40>=\$C\$40	Not Binding	1
\$A\$41	Constraints:	34	\$A\$41>=\$C\$41	Not Binding	33
\$A\$42	Constraints:	42	\$A\$42>=\$C\$42	Not Binding	41
\$A\$43	Constraints:	1	\$A\$43=\$C\$43	Binding	0
\$A\$44	Constraints:	1	\$A\$44=\$C\$44	Binding	0
\$A\$45	Constraints:	1	\$A\$45=\$C\$45	Binding	0
\$A\$46	Constraints:	1	\$A\$46=\$C\$46	Binding	0
\$A\$47	Constraints:	1	\$A\$47=\$C\$47	Binding	0

\$E\$36	>= 174		1	\$E\$36=\$G\$36	Binding	0
\$E\$37	>= 174		1	\$E\$37=\$G\$37	Binding	0
\$E\$38	>= 174		1	\$E\$38=\$G\$38	Binding	0
\$E\$39	>= 174		1	\$E\$39=\$G\$39	Binding	0
\$E\$40	>= 174		1	\$E\$40=\$G\$40	Binding	0
\$E\$41	>= 174		1	\$E\$41=\$G\$41	Binding	0
\$E\$42	>= 174		1	\$E\$42=\$G\$42	Binding	0
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\$E\$47		0	1	\$E\$47=\$G\$47	Binding	0
\$E\$48	174		1	\$E\$48=\$G\$48	Binding	0
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\$M\$49	=	0	\$M\$49=\$O\$49	Binding	0

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\$A\$23=Binary

\$A\$25=Binary

\$A\$27=Binary

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