

PART B – Using Controls

Controls are Windows Objects such as Drop-down Menus (also called Combo Boxes), List Boxes, Option Buttons, Command Buttons, Spinners, Scroll Bars, etc. Controls are used to simplify the use of Decision Support Tools and also to control user input into decision support tools. For example, the Reheat Setting criterion used in the toaster example can only have the choices Yes or No. We do not want the user to be able to input any other answer, because if they did our Decision Support Tool would not work. In this case we can use a Drop-down menu, containing the options Yes and No, to control user input.

In Part B we will add controls to our spreadsheet to control inputs in the Performance Matrix and Weights in the Score Matrix. **To access Controls in Excel you must turn on the Forms Toolbar. To do this, go to Form under the View Menu and select Forms (Figure 18). The Forms Toolbar should now appear (Figure 19).**

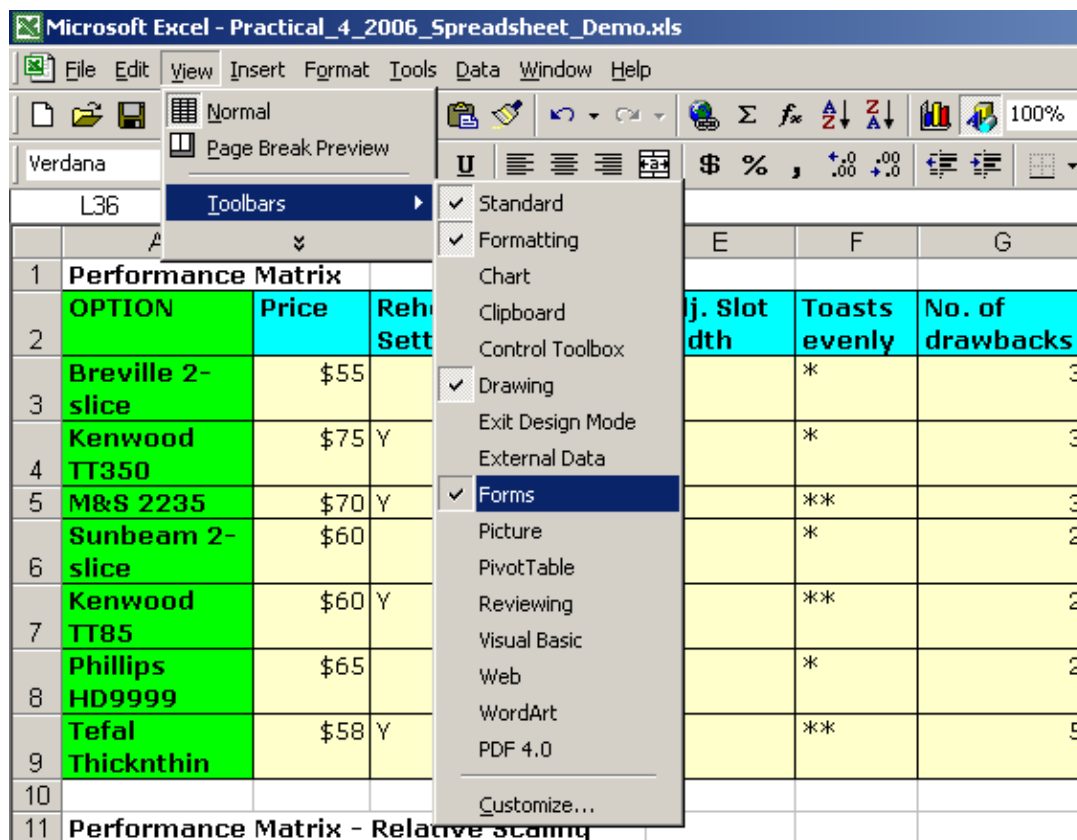


Figure 18

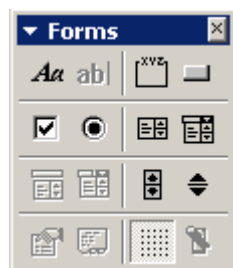


Figure 19

1. Use Drop-down Menus to Control Inputs to the Performance Matrix

First we will add Drop-down Menus to our Performance Matrix to control the inputs for categorical criteria, i.e. Reheat Setting, Warming Rack, Adj. Slot Width and Toasts Evenly.

- a) Select the Combo Box Control on the Forms Toolbar (Figure 20).

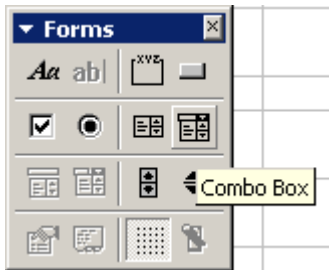


Figure 20

- b) Position your Mouse over the Reheat Setting cell for Breville 2-slice in the Performance Matrix (cell C3) and drag and drop a Drop-down Menu on it. Your Performance Matrix should now look like Figure 21.

	A	B	C	D	E	F	G
1	Performance Matrix						
2	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks
3	Breville 2-slice	\$55	▼			*	3
4	Kenwood TT350	\$75	Y	Y	Y	*	3
5	M&S 2235	\$70	Y	Y		**	3
6	Sunbeam 2-slice	\$60				*	2
7	Kenwood TT85	\$60	Y			**	2
8	Phillips HD9999	\$65				*	2
9	Tefal Thicknthin	\$58	Y		Y	**	5

Figure 21

- c) Type the options No and Yes in a blank section of the spreadsheet beside the Performance Matrix (Figure 22).

No	
Yes	

Figure 22

- d) Right-click on the Drop-down Menu you added to the Performance Matrix and select Format Control (Figure 23). This will open the Format Control Window (Figure 24).

	A	B	C	D	E	F	G
1	Performance Matrix						
2	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks
3	Breville 2-slice	\$55				*	3
4	Kenwood TT350	\$75	Y			*	3
5	M&S 2235	\$70	Y			**	3
6	Sunbeam 2-slice	\$60				*	2
7	Kenwood TT85	\$60	Y			**	2
8	Phillips HD9999	\$65				*	2
9	Tefal Thicknthin	\$58	Y		Y	**	5

Figure 23

Format Control

Size Protection Properties Web **Control**

Input range:

Cell link:


Drop down lines:

☐ 3D shading

OK Cancel

Figure 24

- e) Enter the Input Range, Cell Link and number of Drop-down Line. The Input Range is the cell range in which you entered the Reheat Setting options (Figure 22 above). The Cell Link is the cell where you want the output of the Drop-down Menu to be stored. In this

case it is the Reheat Setting cell for Breville 2-slice in the Performance Matrix (cell C3). The number of Drop-down lines is the number of options that will appear in the Drop-down Menu. In this case it is 2. The settings in the Format Control Window should look like Figure 25 (**Tip:** You can also use the select buttons  beside Input Range and Cell Link to select the cells for these settings). Click OK when finished.

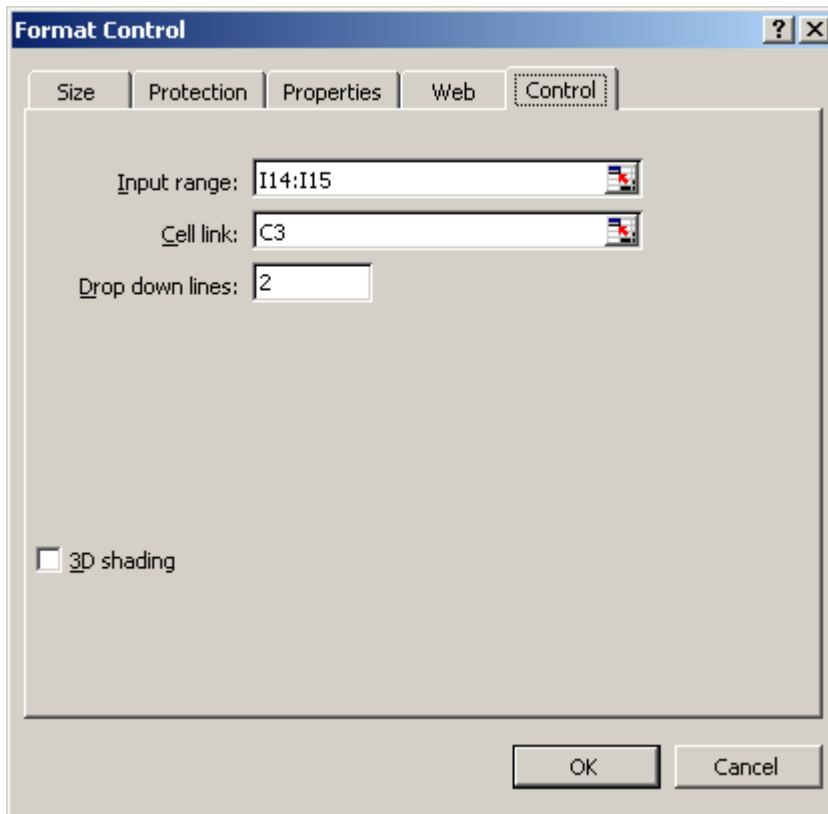


Figure 25

- f) Now when you click on the Drop-down Menu button, the option No and Yes should appear (Figure 26).

	A	B	C	D	E	F	G
1	Performance Matrix						
2	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks
3	Breville 2-slice	\$55	▼			*	3
4	Kenwood TT350	\$75	No Yes	Y	Y	*	3
5	M&S 2235	\$70	Y	Y		**	3
6	Sunbeam 2-slice	\$60				*	2
7	Kenwood TT85	\$60	Y			**	2
8	Phillips HD9999	\$65				*	2
9	Tefal Thicknthin	\$58	Y		Y	**	5

Figure 26

- g) Select the Yes option from your Drop-down Menu. Now right-click on your Drop-down Menu and drag it to one side. You will see that the number 2 has been written to the Reheat Setting cell for Breville 2-slice in the Performance Matrix (cell C3 in Figure 26). If you select No from your Drop-down menu you will see that the number 1 is written to this cell. Hence the control outputs 1 for No and 2 from Yes. This means that the formula in your Relative Scaling Performance Matrix must be updated.

Select the Reheat Setting cell for Breville 2-slice in your Relative Scaling Performance Matrix (cell C13) and edit its formula replacing Y with 2 (Formula 10). Note that 2 is not surrounded by quotation markings since it is a number, not text.

=IF(C3=2,100,0)

Formula 10

Use the Formula Bar (Figure 27) to edit formula and hit Enter when you are finished editing.

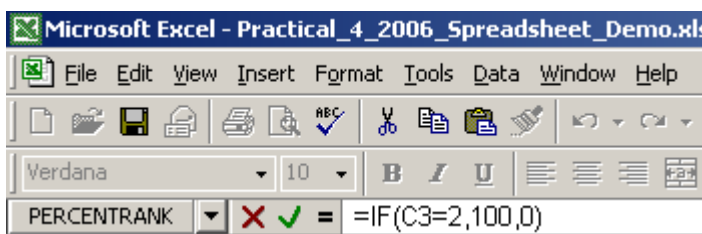


Figure 27

- h) Right-click and copy the Reheat Setting cell for Breville 2-slice in your Relative Scaling Performance Matrix (cell C13) and paste it to the Reheat Setting, Warming Rack, Adj. Slot Width and Toasts Evenly cells for all options in your Relative Scaling Performance Matrix (cells C13 to F19).
- i) You now need to add Drop-down Menus to your Performance Matrix for all options listed under Reheat Setting, Warming Rack, Adj. Slot Width and Toasts Evenly. This can be

done quickly by right-clicking on the Drop-down menu you have already created, selecting copy and then pasting it to the remaining cells. Your Performance Matrix should now look like Figure 28.

	A	B	C	D	E	F	G
1	Performance Matrix						
2	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks
3	Breville 2-slice	\$55	No ▼	No ▼	No ▼	No ▼	3
4	Kenwood TT350	\$75	No ▼	No ▼	No ▼	No ▼	3
5	M&S 2235	\$70	No ▼	No ▼	No ▼	No ▼	3
6	Sunbeam 2-slice	\$60	No ▼	No ▼	No ▼	No ▼	2
7	Kenwood TT85	\$60	No ▼	No ▼	No ▼	No ▼	2
8	Phillips HD9999	\$65	No ▼	No ▼	No ▼	No ▼	2
9	Tefal Thicknthin	\$58	No ▼	No ▼	No ▼	No ▼	5

Figure 28

- j) Open the Format Control Window for each Drop-down Menu and edit the Cell Link so that the output from each menu points to the appropriate cell in the Performance Matrix.
- k) Because the Toasts Evenly criterion uses star ratings rather than Yes/No options, we need to change the Input Range of the Drop-down Menus for this criterion. First, type the options * and ** in a blank section of the spreadsheet beside the Performance Matrix – next to the Yes and No options if you wish (Figure 29). Then edit the Input Range of the Toasts Evenly Drop-down Menus to point to the range where you entered * and **. Your Performance Matrix should now look like Figure 30.

No	*	
Yes	**	

Figure 29

	A	B	C	D	E	F	G
1	Performance Matrix						
2	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks
3	Breville 2-slice	\$55	No ▼	No ▼	No ▼	* ▼	3
4	Kenwood TT350	\$75	No ▼	No ▼	No ▼	* ▼	3
5	M&S 2235	\$70	No ▼	No ▼	No ▼	* ▼	3
6	Sunbeam 2-slice	\$60	No ▼	No ▼	No ▼	* ▼	2
7	Kenwood TT85	\$60	No ▼	No ▼	No ▼	* ▼	2
8	Phillips HD9999	\$65	No ▼	No ▼	No ▼	* ▼	2
9	Tefal Thicknthin	\$58	No ▼	No ▼	No ▼	* ▼	5

Figure 30

2. Use Spinners to Adjust Weights in the Score Matrix

Spinners allow you to adjust a number up or down. Here we will use them to adjust the weights in our Score Matrix.

- a) Spinners output integers. This means we have to change the format of our weight cells from Percentage to General.
 - i. Select the cells in your Score Matrix that contain the criteria weights (cells B30 to G30).
 - ii. Select Cells from the Format menu and then select General.
- b) Select the Spinner Control on the Forms Toolbar (Figure 31).

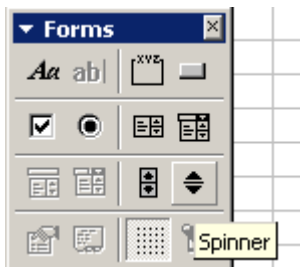


Figure 31

- c) Drop and drop a Spinner Control on the cell containing the weight for Price in your Score Matrix (cell B30).
- d) Right-click on the Spinner and select Format Control. Enter the settings for the Spinner in the Format Control Window (Figure 32). Click OK when you have finished.

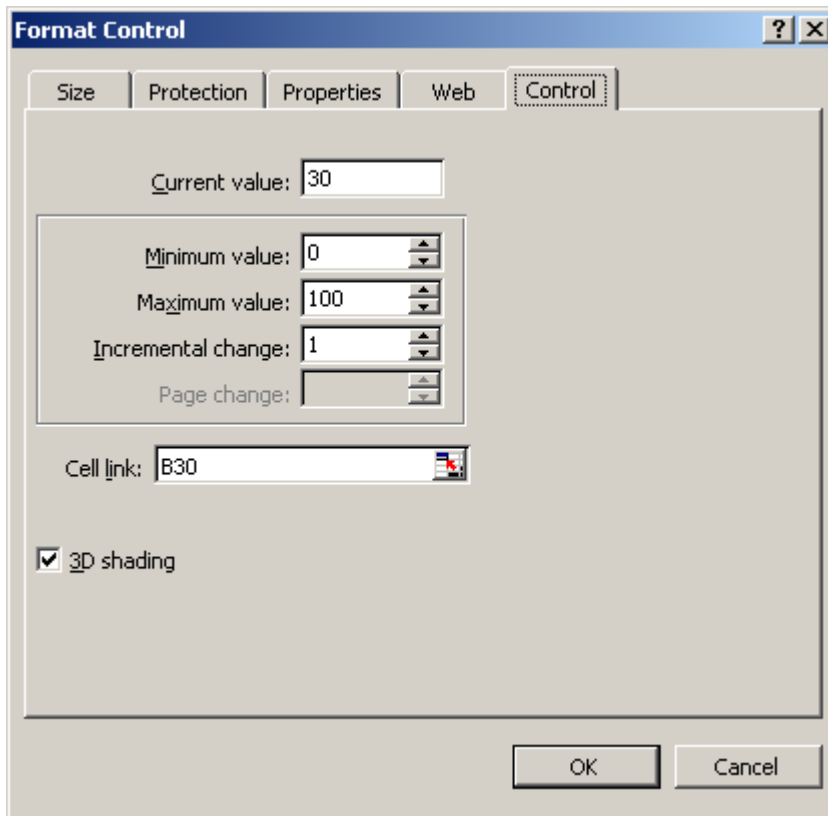


Figure 32

e) Your Score Matrix should now look like Figure 33.

	A	B	C	D	E	F	G	H	I	J
21	Score Matrix - Importance Weights Given to Criteria									
22	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks	Total Score	Rank	% Max Score
23	Breville 2-slice	100	0	0	0	0	66.6666667	36.66667	1	100
24	Kenwood TT350	0	0	0	0	0	66.6666667	6.666667	7	18
25	M&S 2235	25	0	0	0	0	66.6666667	14.16667	6	39
26	Sunbeam 2-slice	75	0	0	0	0	100	32.5	2	89
27	Kenwood TT85	75	0	0	0	0	100	32.5	2	89
28	Phillips HD9999	50	0	0	0	0	100	25	5	68
29	Tefal Thicknthin	85	0	0	0	0	0	25.5	4	70
30	Weights	30	5	15	25	15	10			
31										
32	You need to adjust weights by 0									

Figure 33

f) Now copy your Spinner and paste to the other cells in your Score Matrix containing weights. Open the Format Control Window for these Spinners and set the Cell Link to the

appropriate cell. Also set the current value for each Spinner. Your Score Matrix should now look like Figure 34.

	A	B	C	D	E	F	G	H	I	J
21	Score Matrix - Importance Weights Given to Criteria									
22	OPTION	Price	Reheat Setting	Warming Rack	Adj. Slot Width	Toasts evenly	No. of drawbacks	Total Score	Rank	% Max Score
23	Breville 2-slice	100	0	0	0	0	66.6666667	36.66667	5	52
24	Kenwood TT350	0	100	100	100	0	66.6666667	51.66667	3	73
25	M&S 2235	25	100	100	0	100	66.6666667	49.16667	4	70
26	Sunbeam 2-slice	75	0	0	0	0	100	32.5	6	46
27	Kenwood TT85	75	100	0	0	100	100	52.5	2	74
28	Phillips HD9999	50	0	0	0	0	100	25	7	35
29	Tefal Thicknthin	85	100	0	100	100	0	70.5	1	100
30	Weights	▲ 30 ▼	▲ 5 ▼	▲ 15 ▼	▲ 25 ▼	▲ 15 ▼	▲ 10 ▼			
31										
32	You need to adjust weights by						0			

Figure 34

g) Because the weights are no longer Percentages, we need to modify the Total Score formulas for each option in the Score Matrix and the formula in the cell beside “You need to adjust weights by”.

- i. Select the Total Score cell for Breville 2-slice (cell H23 in Figure 34) and modify its equation to look like Formula 11. Formula 11 now divides the criteria weights by 100.

$$=(B23*(B\$30/100))+(C23*(C\$30/100))+(D23*(D\$30/100))+(E23*(E\$30/100))+(F23*(F\$30/100))+(G23*(G\$30/100))$$

Formula 11

- ii. Right-click and copy the Total Score cell for Breville 2-slice (cell H23 in Figure 34) and paste to the Total Score cells for the remaining options.
 iii. Select the cell beside “You need to adjust weights by” (cell D32 in Figure 34) and modify its equation to look like Formula 12. Formula 12 now calculates the difference between 100 and the sum of the weights.

$$=100-(SUM(B30:G30))$$

Formula 12

Congratulations, you are finished! Play around with your spreadsheet, adjusting the input in your Performance Matrix and the criteria Weights in your Score Matrix. Your graph should adjust as you do this to show how the options compare.