

EXPERT CHOICE TUTORIAL

This tutorial will guide you through two practice problems.

- 1) You will **build**, **make assessments** in, **synthesize**, and perform **sensitivity** on an EC model to find the best place to go on vacation.
- 2) You will create another type of model to **rate** vacation cities against standards you will establish.


EXERCISE 1 - CHOOSING A VACATION SPOT

In this exercise you will build a model and perform pairwise assessments throughout. You will then synthesize to get your results and perform sensitivity analyses.

Your goal will be to find the best vacation place. We suggest you limit the number of criteria to four, and the places to three or four. You might choose from criteria such as cost, night life, friends, shopping, ocean, scuba diving, hiking, golfing, ease of getting to, climate, attractions, etc.

START A NEW MODEL

To start a new model, do the following:


1. Click on the EXPERT CHOICE icon  on the desktop, or select Start, Programs, Expert Choice 2000 and select the Expert Choice 2000 icon.
2. Select File then New from the menu. Enter a name for your model (for example, Vacation).
3. Enter a brief description such as SELECT BEST PLACE TO GO ON VACATION.

ENTER YOUR OWN CRITERIA AND VACATION PLACES

Enter the Criteria

1. Select Edit then Insert Child of Current Node from the menu type your first criterion and press the <Enter> key. Continue entering criteria
2. Press <Esc> to stop the process of inserting criteria.

Enter the Alternatives

1. Next you will enter the alternatives, the cities, by selecting Edit Alternative Insert, or by clicking the “Add Alternative” Icon  at the top right of the Alternatives panel.

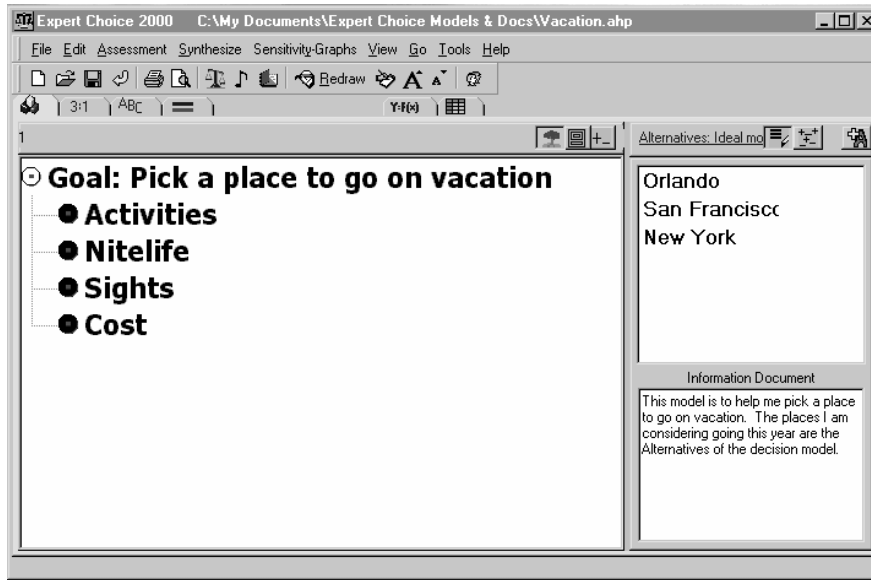



Figure 1. An Example of a Vacation Model.


The model is now complete. An example is shown in Figure 1. The goal and criteria are in the *treeview*  panel at the left. The alternatives are in the Alternative Panel at the right. You could also insert subcriteria and sub-subcriteria in the treeview panel as well, but we asked you to keep it simple this time.

MAKING ASSESSMENTS (ENTERING YOUR JUDGMENTS)

Move to the goal node to make assessments (i.e. enter your judgments) on the criteria.

First enter judgments for the importance of the criteria with respect to the goal, then the alternatives with respect to each criterion. Use these steps:

- 1) Move to the Goal Node and click on it.
- 2) Select Assessment then Pairwise from the menu, then select:

The verbal assessment screen for the criteria is shown in Figure 2. To move back to the main screen at any time click the blocks icon  for the treeview of the model.

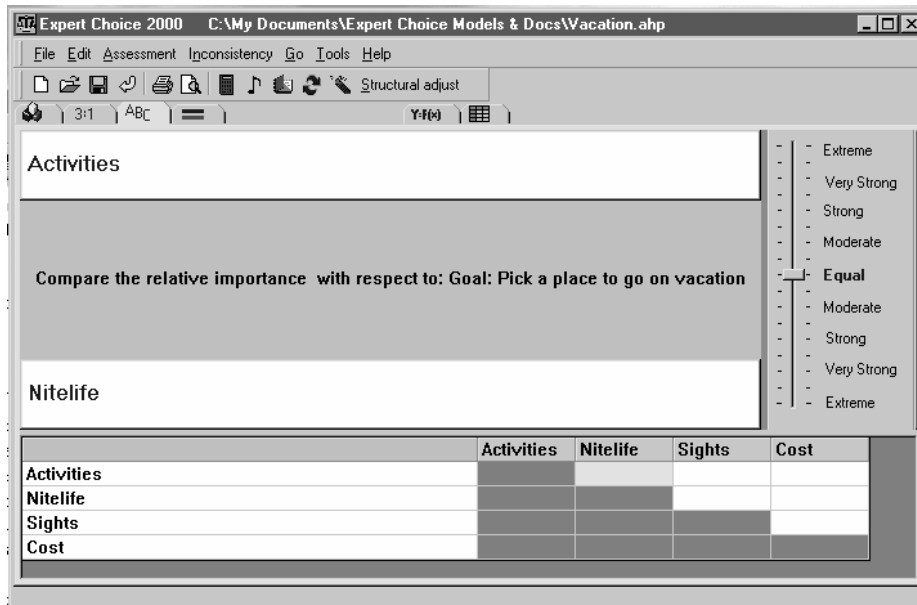


Figure 2. The Verbal Assessment Screen where you will make Judgments.

- Click with the mouse to move the indicator up and down the scale. Move it up if Activities are more important to you and move it down if Nitelife is more important to you.
- When you are finished with a judgment, move to the next cell by clicking in it with the mouse.

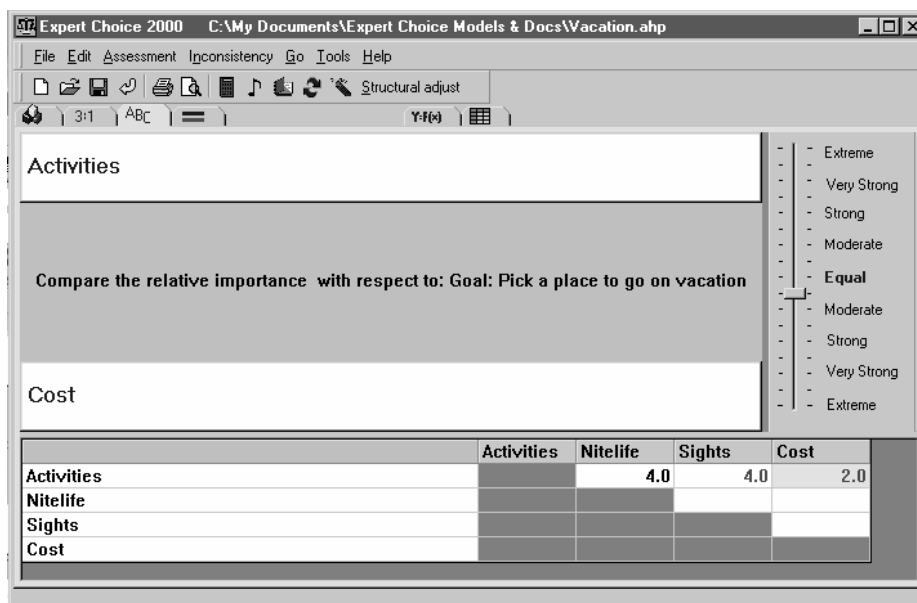


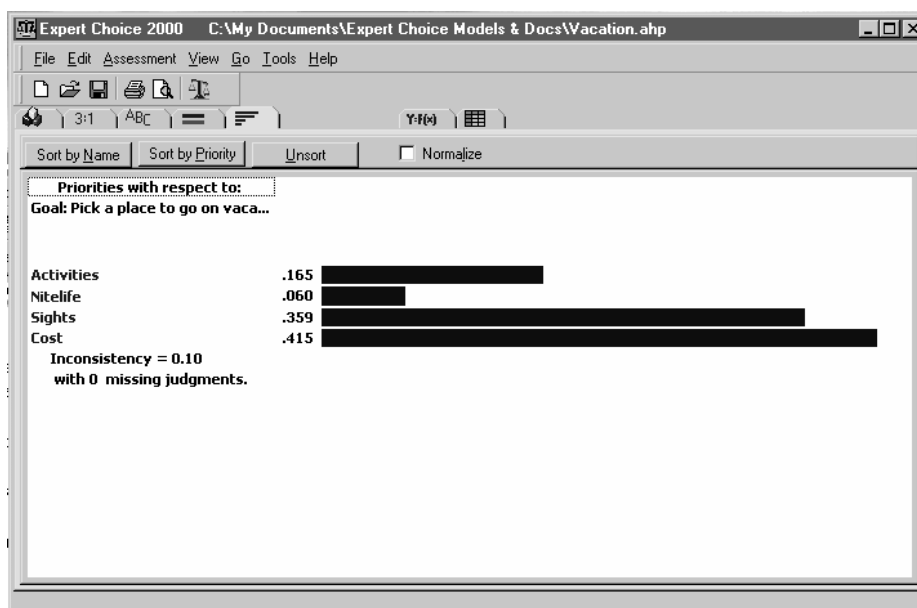


Figure 3. The Verbal Comparison Screen as it appears when Judgment 3 is the Current Judgment.

Figure 3 shows three of the six judgments entered. When the number is in red, it indicates the criterion at the top is more important than the criterion at the left. When it is in black, the one at the left is more important than the one at the right. So, here we have:


- **Activities** are between moderately and strongly more important than **nitelife**.
- **Sights** are between moderately and strongly more important than **Activities**
- **Cost** is between equally and moderately more important than **Activities**.

When you finish the comparisons by filling in all the white cells, click on the Calculate icon  to find the priorities of the criteria with respect to the goal. If you accidentally end up back on the main screen, click on the  tab to return to the Verbal assessment screen and click Calculate.




IMPROVING INCONSISTENCY

The **Inconsistency ratio**, shown at the bottom of the priorities screen is 0.1. It should be about 0.1 or less. It is okay here, but we will show you how to improve it in any case.

- Return to the pairwise comparison screen by clicking the ABC icon .
- Select Inconsistency, 1st from the menu to reveal the most inconsistent judgment.

Activities	Nitelife	Sights	Cost
	4.0	4.0	2.0
		5.0	5.0
			2.0
Incon: 0.10			

The judgment in red, 4.0, for Activities at the left versus Sights at the top will be highlighted as the 1st most inconsistent judgment. A red judgment is an “inverted” judgment because the element at the top, Sights, is more important than the element at the left.

- Select the Inconsistency command and Best Fit on its dropdown menu to have the best judgment of “inverted 1.1” displayed. This means keep the judgment in red (i.e. Sights is more important) and replace the 4.0 with 1.1. To “invert” or “uninvert” a judgment, use the indicator on the scale, or click the invert icon 



This process will reduce the inconsistency to .02.

COMPARE THE CITIES UNDER EACH CRITERION

Move to each criterion in turn by clicking on it and compare the cities using the Assessment command as you did the criteria. Note that this time the cities are compared using the word “preference”. Which city do you “prefer” for activities? And so on.

SYNTHESIZING TO GET RESULTS

After all your judgments have been entered, return to the main treeview of the model, and select the Synthesize, from Main Goal command. The results of the model are shown in Figure 4.

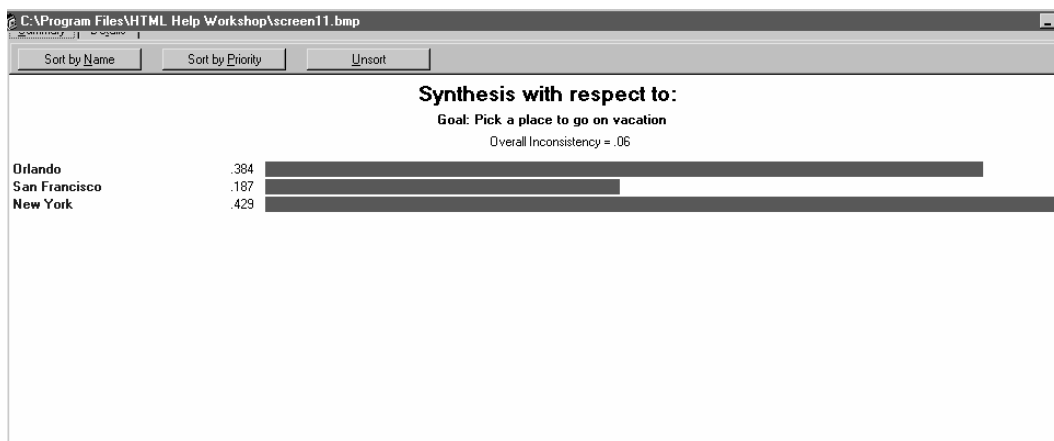


Figure 4. Results Showing New York is Best.

SENSITIVITY ANALYSIS

Do sensitivity analysis with the Sensitivity-Graphs command. In doing sensitivity analysis one varies the priorities of the criteria to observe the effect on the priorities of the alternatives.

Experiment with changing the priorities of your criteria (by clicking and dragging the criterion bars).

All five types of sensitivity available in Expert Choice are shown in the next page in ¡Error! No se encuentra el origen de la referencia.: Performance, Gradient, Dynamic, 2-D Plot and Differences. You can open four types of sensitivity at once.

- Select Sensitivity-Graphs then Dynamic Sensitivity from the menu, and drag the bars for the criteria back and forth to see the effect of changing their priorities.

Select Sensitivity All Four from the Window menu to see the all the graphs displayed at once.

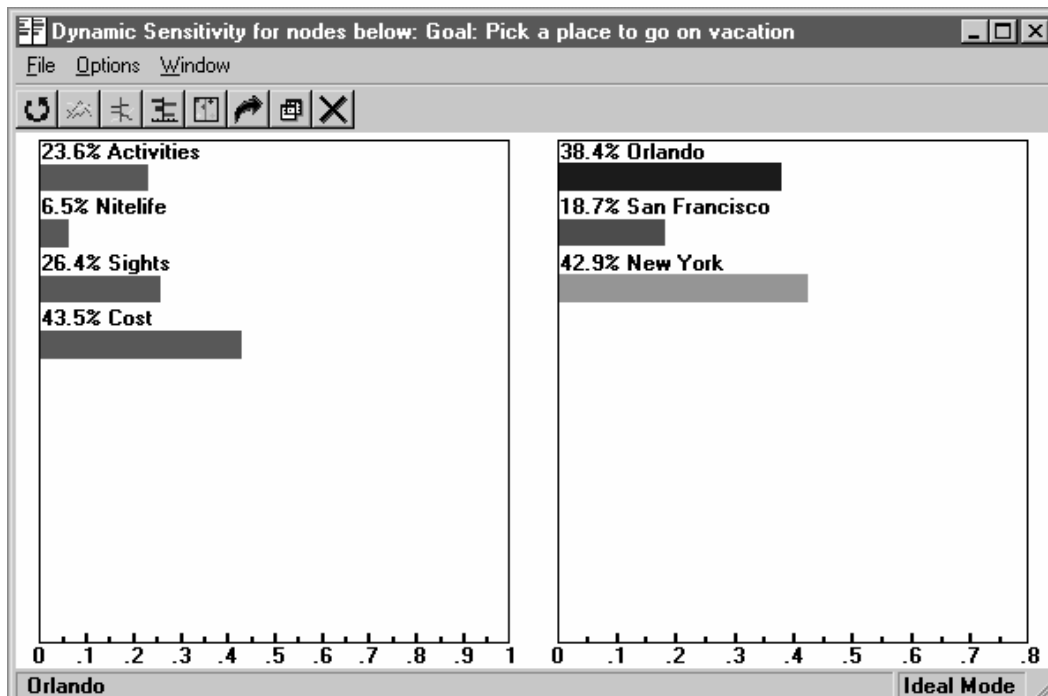


Figure 5. Dynamic Sensitivity Graphs showing New York is Best.

EXPERT CHOICE TUTORIAL

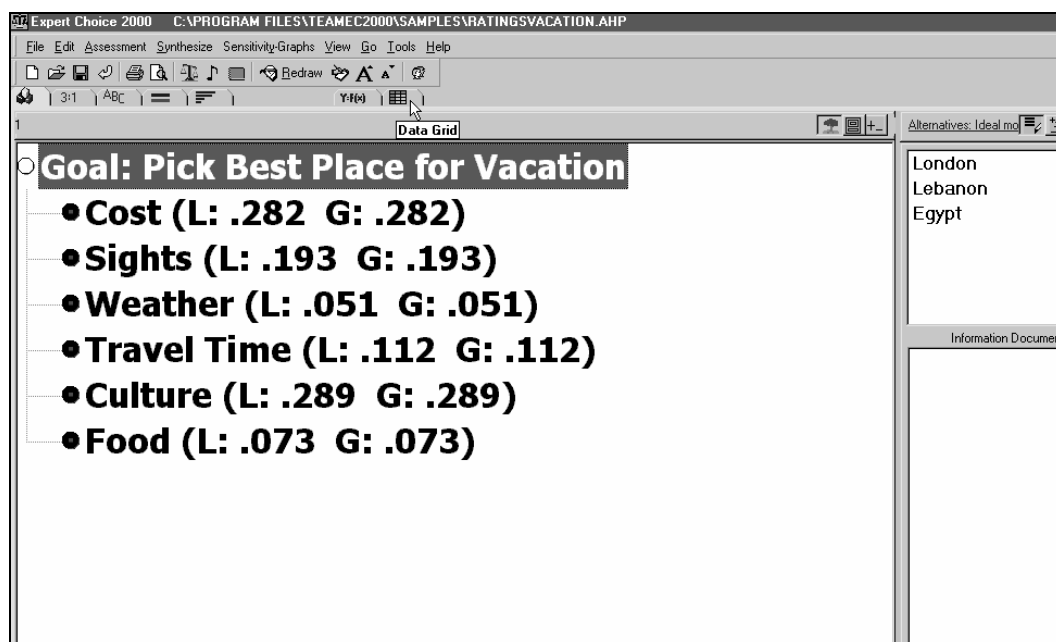
This tutorial will guide you through two practice problems.

- 3) You will **build**, **make assessments** in, **synthesize**, and perform **sensitivity** on an EC model to find the best place to go on vacation.
- 4) You will create another type of model to **rate** vacation cities against standards you will establish.


EXERCISE 2 - CONVERT THE PREVIOUS MODEL INTO A RATINGS MODEL

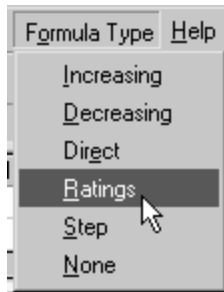
In this exercise you will convert a Vacation model into a ratings model by replacing the alternatives with rating intensities, which will serve as standards. The alternatives are entered into a ratings spreadsheet where they are rated against the standards established in the main model. The Process of rating alternatives against standards is referred to as performing absolute measurement.

We shall show the process using the model in the following figure.



Vacation Model

1. Start with your model from Exercise 1.
2. Make a copy of it by selecting **File**, **S**ave **a**s, then enter a new name such as VACATN2. This process leaves you in a copy of the model.
3. Click on the Data Grid icon  to get into the Ratings spreadsheet.
4. Click on the first cell in the spreadsheet. Then select **Formula Type** from the menu and **Ratings** as shown below.



ESTABLISH RATING INTENSITIES FOR EACH COLUMN (AND PRIORITIZE)

When you wish to use the same scale for more than one column go to the Formulas Grid by clicking on the icon . All the formulas for the criteria are displayed here (after you have selected or created them). We used a **ratings** formula for the three criteria below.

1. THE SAME RATINGS SCALE IS USED FOR 3 CRITERIA: COST, CULTURE,

	Excellent	Above Averag	Average	Below Averag
FOOD	1 (.1.000)	2 (.538)	3 (.189)	4 (.089)

2. A STEP SCALE IS USED FOR THE COST CRITERION

Cheap	Moderate	Above Avg	Med High	High
1 (.206)	2 (.1.000)	3 (.889)	4 (.381)	5 (.095)
0	1200	2500	4000	5000

In this scale data is used about the cost. The first step is \$0 up to \$1200 (cheap), the second step is \$1200 up to \$2500 (moderate), the third step is \$2500 up to \$4000 (Above Avg), the fourth step is \$4000 up to \$5000 (Med High), and the fifth step is above \$5000 (High). Select the Step type of formula to input data in ranges in this way. Enter the actual data value in the cell when doing the assessments.

3. A DIFFERENT RATINGS SCALE IS USED FOR THE WEATHER CRITERION

Moderate	Warm	Cool & Cloud	Hot
1 (.1.000)	2 (.450)	3 (.180)	4 (.100)


Note that the extremes of cool and cloudy and hot have the lowest values.

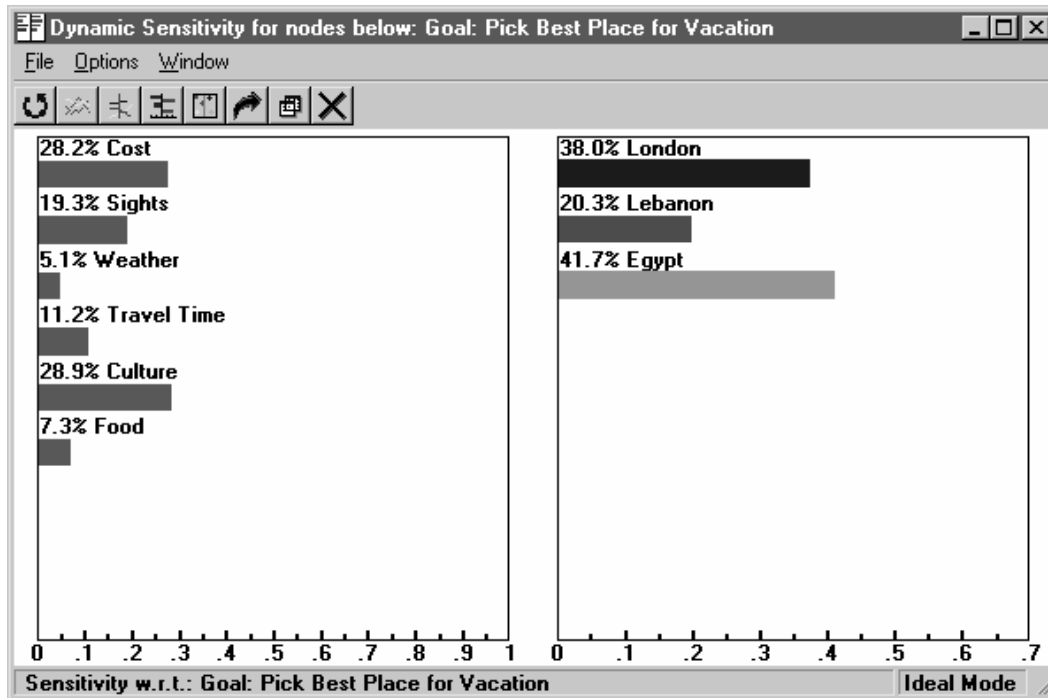
4. ANOTHER RATINGS SCALE IS USED FOR TRAVEL TIME

less than si	six to < 12	twelve to <	eighteen to	twentyfour h
1 (.1.000)	2 (.475)	3 (.209)	4 (.074)	5 (.058)

The ratings above are in terms of travel time:

- a) less than six hours
- b) from six up to 12 hours
- c) from 12 up to 18 hours
- d) from 18 up to 24 hours

To perform sensitivity from a ratings model you must extract the top alternatives into a relative model. Right click with the mouse on each alternative to be extracted as an alternative to the main model. Then return to the main model view by clicking on the icon . You will then perform sensitivity in the usual with the command Sensitivity-Graphs, Dynamic to see the sensitivity shown in the figure below.



Return to the Main Model and Select Sensitivity-Graphs to Perform Dynamic Sensitivity.