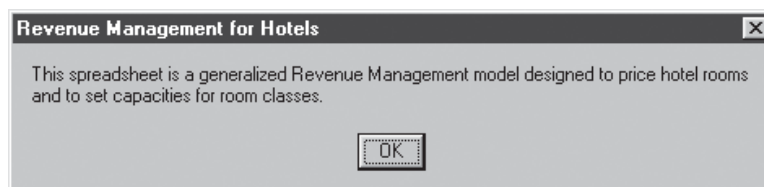


# 25. TUTORIAL FOR REVENUE MANAGEMENT FOR HOTELS (revenue.xls)

## CASE: FORTE HOTEL REVENUE MANAGEMENT, P. 455

Revenue management models are intended to optimize the pricing of hotel rooms, airline seats, and other “perishable” commodities for a given duration by taking into account demand variability over time and capacity constraints. Our Revenue Management system for the hotel industry runs on the Excel spreadsheet. The task is to price hotel rooms and set capacities for various room classes.

From the **Model** menu, select **Revenue Management for Hotels** and then the **Generalized Revenue Model** to see this introduction:



Click **OK** to continue.

## PHASE 1— DESIGNING THE HOTEL

In phase 1, you outline the characteristics of the hotel. As an example follow the simple hotel setup that consists of two classes. Provide the requested information for the three fields and click **Next** to advance to the second step of this phase.

The screenshot shows a spreadsheet window titled "Marketing Engineering - Revenue.xls". The active sheet is "p1F3". The spreadsheet content is as follows:

	A	B	C	D	E	F	G	H	I	J
1										
2										
3										
4										
5										
6										
7										
8										
9										
10			Study Title			Lions Sleep Inn				
11										
12										
13			Number of Classes ( 2 to 6 )			2			Help	
14										
15										
16			Total Capacity Across All Classes (Rooms)			100			Discard	
17										
18									Next	
19										
20										
21										
22										
23										

Next, name the classes (fifteen characters maximum), provide some baseline information about the prices and the expected demand at these prices, and finally give demand elasticity estimates for each of the classes. (Elasticity is the percentage decrease in demand with a one-percent increase in price.) The model assumes constant elasticity coefficients in each class. Click **Finish** to proceed.

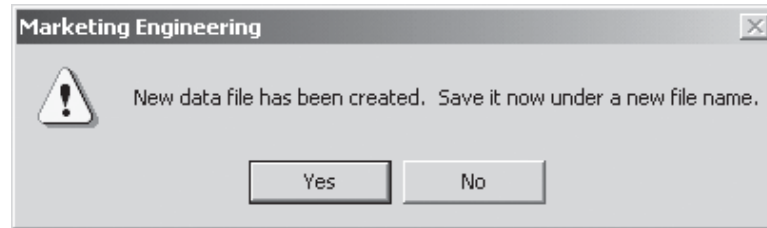
The screenshot shows a spreadsheet window titled "Marketing Engineering - Revenue.xls". The active sheet is "S14". The spreadsheet content is as follows:

	L	M	N	O	P	Q	R	S	T	U	V
1											
2											
3											
4											
5											
6											
7											
8											
9											
10			Class Name	Base Price	Demand at	Elasticity					
11			(15 Char Max)	(\$/night)	Base Price	(> 1.0)					
12			Standard	\$130.00	50	1.5					
13			Discount	\$55.00	90	2.5					
14											
15											
16											
17											
18											
19			Prev								
20											
21											
22											
23											

Note: Elasticity is the percentage decrease in demand with a one percent increase in price

Now that you have set up all the base properties for the model, the system creates a new Excel workbook that incorporates the information provided up to now.

It is a good idea to save your newly configured model now. If you do, give it any name other than Revenue.xls.



## PHASE 2 — SEASONAL PRICE AND CAPACITY PLANNING

Now customize all the fields marked by blue entries, i.e., target date, marginal cost, demand information, and values for seasonal multipliers. See the explanations given in the spreadsheet for each table column.

**Phase 2: Seasonal Price and Capacity Planning**

**Lions Sleep Inn**

Target Season= Summer      Next

Number of Classes = 2

Total Capacity Across All Classes= 100

**Phase 2.1: Setup Seasonal Plan**

Class	Marginal Cost(1)	50% (Days)(2)	75% (Days)(2)	Seasonal Multip.(3)
Standard	\$9.00	15	5	0.00%
Discount	\$0.00	45	20	0.00%

(1) Incremental marginal cost per night over lowest class room  
 (2) How does business come in over time?  
 For each class, how many days on average before the booking day during the target season will 50%/75% of the bookings be received?  
 (3) Seasonal multiplier (% above/below "normal" demand) for target season

The target season, e.g., summer, serves as a reference for the demand function specification. The way demand generally arrives over time for each class is specified in columns 3 and 4. For instance, using the "standard" class in the example, fifteen days on average before the arrival date during the target season (target date), the hotel will have bookings for approximately half of its Standard rooms; five days before the target date, it will have bookings for about 75 percent of its Standard rooms. The class segments are assumed to be distinct, so no one switches class if the price differential changes in the optimization process.

Instead of setting up the demand function specific to the target season, you can specify an “average” time-demand relationship for each of the classes and make seasonal adjustments: the seasonal multipliers are the percentage deviations from the normal demand.

Click **Next** to go to the next screen:

The screenshot shows the 'Marketing Engineering - Revenue.xls' spreadsheet. The active cell is B31, containing '\$150.00'. The spreadsheet is titled 'Phase 2.2: Optimization' and includes the following parameters:

- Target Season= Summer
- Total Capacity Across All Classes= 100
- Min Price Difference (%) Between Classes= 12%
- Maximum Price for Highest Class= \$150.00

Buttons for 'Optimization' and 'Back' are visible. Below the parameters is a table with the following data:

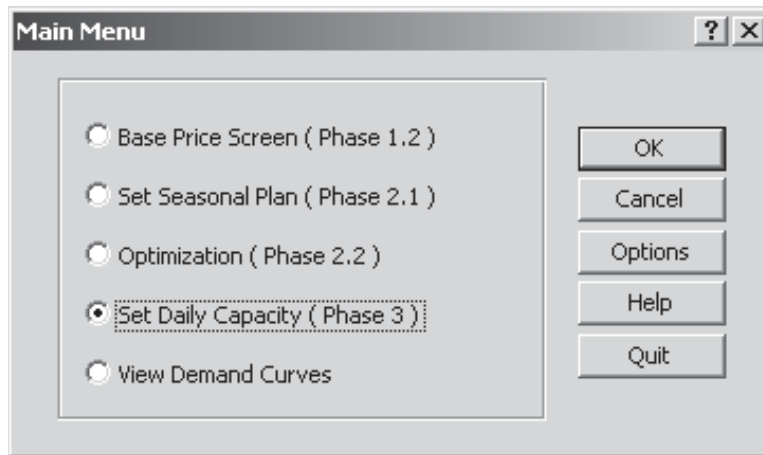
Class	Predicted Demand	Model Capacity	Price	Utilized Capacity	Revenue Multiplier (1)	Revenue
Standard	41	41	\$150	41	1.00	\$5,637
Discount	59	59	\$66	59	1.00	\$3,867
<b>Total=</b>		<b>100</b>		<b>100</b>		<b>\$9,504</b>

Below the table, a note states: (1) A customer in a revenue-class generates other profit for the hotel (because of use of restaurants, other hotel services, etc). The revenue multiplier captures this additional profit as a multiple (>=1) of daily room price.

Click **Optimization**, and the model will calculate optimal capacities and prices for each of the classes. For instance, the optimization results show that a profit-maximizing pricing strategy implies a room price of \$150 for the Standard class and \$66 for the Discount class.

*Note: Excel's Solver sometimes requires numerous iterations to arrive at the revenue maximizing solution.*

Go to the **Model** menu and select **Main Menu** to access the previous setup screens to modify the parameter estimates you provided earlier or to access other functions of the Generalized Revenue model, such as **View Demand Curves** and **Set Daily Capacity**.



## PHASE 3 — SET DAILY CAPACITY

If you select **Set Daily Capacity (Phase 3)**, you can determine how many rooms to set up for each class given the prices you determined in phase 2. To do so, customize all the fields marked by blue entries, i.e., provide a target date, the number of days before the target date, and indicate how many rooms are booked so far.

Classes	Booked to Date	Add'l Demand	Optimal Allotment	Price	Expected Inc. Revenue (1)
Standard	20	33	60	\$150	\$4,521
Discount	1	19	46	\$66	\$1,248
<b>Total</b>	<b>21</b>				<b>\$5,769</b>

Summary Data:

- Target Season= Summer
- Target Date= 7-Jun-96
- Total Capacity Across All Classes= 100
- Min Price Difference (%) Between Classes= 12%
- Number of Days Before Target Date= 20

Given the “optimal” pricing scheme and the number of rooms booked by the current date (that is, May 18), the model computes the additional demand for the remaining days until the target date and determines the optimal capacity for each class. The “Optimal Capacity” column suggests how many of the unbooked rooms should be allocated to each of the classes. In the example, twenty days are left until the target date.

*Note: The Revenue Management Model refers only to a single specified day for which hotel rooms are booked and does not deal with carryover effects and the like.*

## LIMITATIONS OF THE SOFTWARE

Maximum number of classes: 6