Benihana: A New Look at an Old Classic

Simulation Overview

The Benihana simulation models an evening at Benihana's West 52nd Street restaurant. The restaurant opens at 6 p.m. to light demand, experiences a rush hour from 7 to 8 p.m. and continues to seat new arrivals until 9 p.m. In addition to emulating customer flow patterns and dinner choices, the model incorporates a sensitivity analysis feature that enables the user to examine the impact of altering the restaurant's capacity, and the bar capacity.

Following the instructions below, you will first download the simulation, and then download a free demo copy of the "Extend" software needed to run the simulation.

Downloading the Simulation

Print this page for reference.

1. Click on the "Download Benihana Simulation" command (this will download the "benihana99.mox" file onto your computer, in the location you specify)
2. Click on the "Download Extend" command (you will be linked to www.imaginethatinc.com/frame_downloads.html)
3. Click on "Demo."
1. Click on "Download the Extend Demo Now" (and follow the instructions to download the Extend demo application onto your computer in the location you specify)

You are now set to run the simulation !

Running the Simulation

Open the "benihana99.mox" file that you just saved. (If it asks what application to use to open it specify the Extend application you just saved). Go to the "File" pull down menu and click "Open".You should see a layout of the restaurant's floor plan in the "primary window". Pull down the RUN menu and activate the RUN SIMULATION command. The simulation will generate a plotter that tracks the number of people in the bar (blue plot), the number of dining tables in use (red plot), the total number of customers served (green plot) and the number of customers who opted to depart when the bar was full (gray plot). If you want to run the model with animation in "slow motion" pull down the RUN menu and select "Show Animation". (However, this slows considerably the speed of the simulation.)

Interpreting Simulation Results

The plotter dynamically updates the simulation results, with time displayed on the x-axis. The plotter has two y-axis with different scales. The left vertical axis corresponds to the blue plot (number of people in the bar) and the red plot (number of tables in use). The right vertical axis corresponds to the green plot (total number of people served) and the gray plot (number of customers who arrived and turned away since the bar was full).

If the plotted data exceeds the range of the display, the plotter can be re-sized by a single mouse click on the "auto-scale Y" command located on the menu bar along the top of the "plotter window".

Additional data from the simulation can be accessed once the simulation completes a run. From the MODEL menu, pull down the SHOW NOTEBOOK command. This will bring up a data notebook window that contains simulation results on: utilization rates of the cocktail lounge and dining room, the numbers of each type of dinner served, number of drinks sold as well as the average and maximum wait time for customers in the lounge.

After closing both the notebook and the plotter windows, you will see the main window containing the floor plan. The Sensitivity Analysis block in the lower left corner of the window enables the user to alter the bar's capacity, the restaurant's capacity, and turn "batching" on (= 0) or off (= 1).

When the batching switch is "on," customers are "batched" from the lounge area in groups of 8, replicating Benihana's standard policy. When the batching switch is "off," customers are seated in the dining area based upon the size of their party. (e.g. If a group arrives as a party of five, they will be seated as a party of five and completely occupy an eight-place table).

To run the simulation consecutively up to four times, pull down the RUN menu and select SIMULATION SETUP. This brings up a window that contains an option to change NUMBER OF RUNS. Enter the desired number of runs and select RUN NOW. As each run is executed, the software saves the new plot over the previous. Once all four runs are completed, the results of each may be viewed by a "single click" on the "page tab" at the bottom left corner of the plotter window.

Simulation Details

Demand Profile:

1. Customers arrive in party sizes ranging from 2 to 12, with a mean of 4. (The probability distribution is customized to case data).
2. Party inter-arrival times are generated by an exponential probability distribution. Mean inter-arrival time are: 4 minutes for the 1st and 3rd hours, 1 minute for the "dinner rush."

Benihana Floor Plan and Operating Procedures (unless otherwise specified):

1. The cocktail lounge has a 55 person seating capacity.
2. Customers are "batched" from the bar in groups of 8 to the dining area.
3. The dining area has 14 tables with 8 seats each.

Customer Habits and Preferences:

1. If the bar is full, arriving parties depart immediately instead of waiting to eat.
2. Customers on average consume one drink for every twelve minutes in the bar.
3. The duration of meals is normally distributed with a mean of 60 minutes, standard deviation of 7 minutes.
4. The distribution of beef, chicken and shrimp choices is customized to case data.