Forecasting Analytics

Tableau Demo on Amtrak Data

1. Download the Amtrak data. You can find the dataset AmtrakPassengersMonthly T-Competition.xls at the link http://www.forecastingbook.com/datasets.
2. Import the data into Tableau. Open Tableau and click on Connect to Data > In a file > Microsoft Excel. Browse to the dataset in your file system. Open it and click ok on the dialogue box. Then click on Import all the data.
3. Identify the functional areas of the Tableau workbench. The data are in two columns – a time series of Amtrak ridership from Jan-1991 to Mar-2004. The first column is Month. The second column is Ridership. Tableau will call the Month column a dimension. It will call Ridership a measure. They are listed on the left in separate areas under Data on the workbench.
4. Plot the time series. Because we want an xy-plot with Month on the x-axis and Ridership on the y-axis, we drag Month into the Columns area and Ridership into the Rows area. The resulting plot is not what we want. It shows Ridership for each year. Instead, we want each month within each year to be shown. To fix this, click on the right-down arrow on the YEAR(Month) icon. (Currently, we are summing over the months to get the yearly totals.) From the drop-down menu choose the second Month item. This will change your Columns to MONTH(Month), which is what we want. MONTH(Month) is down to the smallest granularity for this data set, and thus includes one data point in the sum. If we had Ridership by day, we could summarize according to MONTH(Day).
5. Add a trend line to the data. Right click on the chart anywhere: Trend Lines > Show Trend Lines. Remove the trend line.
6. Add a 90% forecast cone for the next year to the end of the time series. Right click on the chart anywhere: Forecast > Show Forecast. Right click anywhere again: Forecast > Forecast Option. Change the forecast horizon to Exactly 1 Years, Ignore last 0 Months, and Show 90% prediction intervals.
7. Explore seasonality. We will plot the average ridership by month on a bar graph. Open a new sheet by clicking on the icon next to Sheet 1 on the bottom of the workbench. Again, drag Month to Columns and Ridership to Rows. Right-click on YEAR(Month) and choose the first Month in the list. This is almost the plot we want now. There are two problems with it. We are currently summing Ridership. Change it to an average. Right-click on SUM(Ridership), select Measure(Sum), and click Average. Next go to Show Me in the upper right corner of the workbench and choose the bar chart icon (third row, first column). Swap the axes. From the Analysis tab, select Swap Rows and Columns. Finally, drag Ridership again onto Marks > Color. Change it to AVG(Ridership).

8. List the point forecast values in tabular form. Create Sheet 3. Again, drag Month to Columns and Ridership to Rows. Go to Show Me. Click on the Colored Table icon (first row, third column). Swap the Rows and Columns. Scroll to the bottom to see the forecasts. This chart is interactive.
9. Create an interactive dashboard. Combine all three sheets into one interactive graphic. Go to the Dashboard tab; select New Dashboard. Drag each sheet to a place on the open workbench. Remove the legends and hide the sheet titles. This dashboard can be exported as a jpeg file, presented in Presentation Mode, or published to the web. To export it, Dashboard > Export Image > Save. To present it, click on the right most icon on the bottom shelf of the ribbon. To publish it, Server > Tableau Public > Save to Web as.