

## NORTHERN NAPA VALLEY WINERY

Northern grows red grapes for its red table wine. Northern has excess grapes from the 2008 season. It is now beginning of September, 2008. Transcontinental Stores has offered to buy all of Northern's excess grapes from the 2008 season. But Northern needs to reserve enough red grapes to meet demand for its red table wine. Northern needs to predict monthly sales for at least Sept, Oct, Nov, Dec of 2008 to know how much to reserve from the sale to Transcontinental. Northern currently forecasts annual sales as a simple linear regression on year. Northern would like to forecast monthly sales.

The case focuses on forecasting sales for Sept-Dec.

Use the data in "Northern Napa Valley Spreadsheet.xls."

### Some things to think about:

1. How well can Northern forecast annual sales?
2. One method to forecast sales for Sept-Dec of 2008 is to forecast sales for all of 2008 and then subtract actual sales for Jan-Aug of 2008. That would yield an estimate of the amount of grapes to withhold from the sale to Transcontinental. What do you think of this method?
3. What are some of the features that you can see in the monthly sales data that should be incorporated into a statistical model for monthly sales?
4. What predictors could potentially represent the long-term trend?
5. What predictors could potentially represent seasonality?
6. What predictors could potentially represent heteroscedasticity?
7. What predictors could potentially represent autocorrelation?
8. Can you find a multiple regression model that can satisfactorily model monthly sales?
9. Are there advantages to switching to modeling changes in sales or percent changes in sales?
10. Can you find a multiple regression model that can satisfactorily model percentage changes in monthly sales?
11. How can you forecast September sales with your model?
12. What adjustments do you need to make in order to forecast sales for Oct, Nov, and Dec?
13. How does your forecast of total sales for Sep-Dec, based on a monthly model, compare with Northern's forecast of total sales for Sep-Dec, based on its current annual forecasting model?

