

## Instructions

- Complete solutions will include good explanation of the process used to find the solution, and complete sentences for any discussion of the answer.
- For questions involving Excel files, email me the Excel file that shows your solution. Clearly label with appropriate headings the cells in the Excel file so I can understand your solution!

**The Excel file you submit should be your own original creation.**

*Remember—when you are using Excel, use new sheets where appropriate (it is usually a good idea to leave original data unaltered in the first sheet, and make modifications on other sheets). Focus on making your Excel file easy for a reader to understand, labeling sheets in a meaningful manner, deleting unnecessary sheets or data, and use AutoShapes for text you wish to include. Also, provide headings or labels to cells that you add, and use color to improve readability.*

## Questions

1. (25 marks) (**Excel Based**) The following website has data on energy costs:

<http://www.eia.gov/electricity/monthly/>

Specifically, Table 5.3 shows Average Retail Price of Electricity to Ultimate Customers from 2003 to 2012. Go to the website and examine the Table 5.3. Download the data into Excel (remember, an Excel file has extension .xls, so look for that on the website—many data websites have downloadable Excel files for you).

- (a) Create in the Excel file a scatterplot of the yearly electricity price for years 2003 to 2012 for residential users. Your scatterplot should include the equation of the linear regression line and the correlation.
- (b) What would you predict the price of electricity to be in 2014 (using the linear regression line)?
- (c) What date (year and month) would you predict the price of electricity will be 14 cents/kwhr (using the linear regression line)?
- (d) How confident do you feel about your estimates in (b) and (c)? Explain why you are confident or not confident in your estimates.
2. (10 marks) Chapter 7.56.
- Tomeka wants to ask a sample of students at her college—it “Do you think Social Security will still be paying benefits when you retire?”. She obtains the college email addresses of all 2654 students attending the college.
- (a) How would you label the addresses to obtain a simple random sample (SRS) of 100 students?
- (b) Using Table 7.1 starting at line 103, choose the first 3 labels in the sample.
- (c) Tomeka sends her question by email to the 100 addresses in her sample. Although she has chosen a SRS, a serious practical difficulty may make it difficult for her to draw conclusions from her sample. What practical difficulty do you expect Tomeka to encounter?
3. (25 marks) You toss a fair coin, and if the coin is heads you roll a die which is *1-6 flat*. If the coin is tails you roll a die that is *skewed right*. The outcome of this game is the number face up on the die when you are done. The probability models for these special dice are given by:

Probability Model for 1-6 flat die:

Face	1	2	3	4	5	6
Probability	1/4	1/8	1/8	1/8	1/8	1/4

Probability Model for skewed right die:

Face	1	2	3	4	5	6
Probability	6/21	5/21	4/21	3/21	2/21	1/21

- (a) Construct, using the rules of probability, the probability model for this game.
- (b) Once you have the probability model, construct a probability histogram of the model.