Statistics and Data Analysis, Fall 2016
Pre-lecture Problems 9

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Note 1. The deadline of submitting the pre-lecture problem is *14:30, November 16, 2016*. Please submit a hard copy of your work to the instructor in class. Late submissions will not be accepted. Each student must submit her/his individual work. Submit ONLY the problem that counts for grades.

Note 2. Please make your answer as clear (i.e., easy to read) as possible. We reserve the right to take away points when the correctness cannot be easily determined (e.g., when the writing is messy and cannot be easily understood).

1. (0 point) Consider the MS Excel file "SDA-Fa16_09_regression2_pl_data.xlsx," which contains the data of the 100 shows.

   (a) Verify that the regression model obtained on page 21 of the slides is right.

   (b) Set the reference level of *Time* to evening by adding $Time^M$ and $Time^A$. How should the values of these two variables be set for each show?

   (c) Construct a regression model with the new reference level. Verify that the coefficients for *Capacity*, *AvgPrice*, and *Year* all remain the same.

   (d) Interpret the coefficients of $Time^M$ and $Time^A$.

2. (0 point) Consider the MS Excel file "SDA-Fa16_09_regression2_pl_data.xlsx," which contains the data of the 100 shows.

   (a) Create two new variables $Time^M \times AvgPrice$ and $Time^E \times AvgPrice$. Set their values for each show.

   (b) Verify that the regression model obtained on page 26 of the slides is right.

3. (10 points; 5 points each) Consider the MS Excel file "SDA-Fa16_09_regression2_pl_data.xlsx," which contains the data of the 100 shows.

   (a) Add a new variable $Capacity \times AvgPrice$. Set its values for each show.

   (b) Construct a regression model with *Capacity*, *AvgPrice*, *Year*, and $Capacity \times AvgPrice$. Interpret the result.