**Homework 1**

Recall the valuation game where you answered a survey to indicate your willingness to pay for an outdoor trip. Survey responses compiled from earlier surveys are in the file “HW1 data.csv”. Starter Python code has been provided in “HW1 – tmp.py” but you’ll need to revise it to include analysis required to answer all questions. HINT: use “NYHCSurvey.py” and learnings from Slide Packet 2, and accompanying videos, to guide you.

Take a look at the data and answer the following questions:

1. **(30 points)** How does average willingness to pay differ by the following segments:
   1. If rafted before vs. not
   2. If camped before vs. not
   3. If trekked before vs. not
   4. Age bucket: <=25, >25
   5. Gender
   6. Marital status

Any interesting observations?

1. **(20 points)** Fit a demand curve for the entire population using the willingness to pay (WTP) data. Try the linear, exponential, and logit demand models. Which one fits the curve the best? Make sure to write down the model formula for each. Create relevant plots for each model.
2. **(20 points)** With the demand curve you chose in the previous question, determine optimal price that will maximize revenue.
3. **(30 points)** Split the data by whether the participant has rafted before (Question 1a). Use the same functional form you determined to be the best fit for the entire population from Question 2, and fit two separate demand curves (one for those that have rafted before and one for those that haven’t). What is the optimal price for each of these two segments? Is overall revenue better or worse than the one in Question 3?

Please submit a short write-up for each of the 4 questions above, along with the Python code you have used to fit the model.

Please make sure to include the names of all members (up to 6 students per group) of your homework group on the cover sheet of your submission.

**Extra credit** may be provided if you correctly optimize revenue for the logit demand function.