Homework #4

Each student should submit a separate assignment, even if it is an identical computer file to the rest of your study group. When submitting assignments, **please include your name and the assignment number as part of the filename**. Please write the names of your study group members at the beginning of your homework.

1. What are the names of the people in your study group?
2. Using the Consumer Expenditure (CEX) Survey data from class, create a linear regression to explain the ratio of expenditures on food at home (FDHOMEPQ) to food away from home (FDAWAYPQ). Choose some useful explanatory variables. Explain the output. Could you do better with a different functional form of the dependent variable? [For which definitions of "better"?]
3. Again with CEX data, consider the ratio of expenditure on housing (HOUSPQ) to income. Conventionally households spending more than 33% of income on housing are at risk. Can you create a k-nn model to classify households spending "too much" on housing? What predictors are useful?

4. *[extra just for review if you find it necessary]* Calculate the answers. You might usefully draw pictures as well as making the calculations.
   a) For a Normal Distribution with mean 12 and standard deviation 0.3 , what is area to the right of 11.82 ?
   b) For a Normal Distribution with mean -9 and standard deviation 1.9 , what is area to the right of -8.43 ?
   c) For a Normal Distribution with mean 1 and standard deviation 6.3 , what is area to the right of 8.56 ?
   d) For a Normal Distribution with mean 9 and standard deviation 0.9 , what is area to the right of 9.09 ?
   e) For a Normal Distribution with mean 15 and standard deviation 1.5 , what is area to the left of 18.6 ?
   f) For a Normal Distribution with mean -15 and standard deviation 0.9 , what is area to the left of -16.44 ?
   g) For a Normal Distribution with mean 10 and standard deviation 0.7 , what is area to the left of 10.14 ?
   h) For a Normal Distribution with mean 4 and standard deviation 9.8 , what is area in both tails farther from the mean than 11.84 ?

i) For a Normal Distribution with mean -14 and standard deviation 4.9 , what is area in both tails farther from the mean than -6.65 ?

j) For a Normal Distribution with mean 2 and standard deviation 3.2 , what is area in both tails farther from the mean than -5.36 ?

k) For a Normal Distribution with mean -5 and standard deviation 6 , what is area in both tails farther from the mean than 5.8 ?

l) For a Normal Distribution with mean 3 and standard deviation 4.9 what values leave probability 0.146 in both tails?

m) For a Normal Distribution with mean 8 and standard deviation 4.4 what values leave probability 0.005 in both tails?

n) For a Normal Distribution with mean -14 and standard deviation 7.5 what values leave probability 0.298 in both tails?

o) For a Normal Distribution with mean 2 and standard deviation 0.5 what values leave probability 0.12 in both tails?