Quantitative Methods II
Assignment 11
November 6, 2011

This is the point in the semester when I like to try to pull all the threads together. Thus, this assignment will be light on the programming and heavy on the model selection. The first series of questions has you determine the correct statistical method to use.

The second series of problems (alright, just the one problem) has you model a count dependent variable. Make sure you answer the question asked. Also, you may want to skim back through Chapters 6 through 8 to see if things make more sense now. I hope so.

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When you turn in this assignment, you will email to me the usual two files: your write-up and your `R` script.

As always, the email needs to include the subject line:

```
POLS6123:  Assignment 11
```

Also as always, if you have problems, let me know. I am happy helping.

For this first group of four questions, I will describe the research question and the dataset, including the types of variables involved. You need to tell me which method you need to use to answer the research question. Also, if you need to do some transformation to the dependent variable, you need to specify which one and why.

Problem: BAC to the Future [[5]]

- RQ: Are the reaction times significantly different for people with a Blood Alcohol Content level of 0.08% versus a BAC level of 0.10%?
- Unit of analysis: Individual person
- Data: The dependent variable is a measure of reaction times for the individual. These range from 0.05 to 0.12 seconds. The independent variable is the BAC level for the individual. These are either 0.08% or 0.10%.

Problem: Duck, Duck, Goose [[5]]

- RQ: To what extent does ambient temperature affect the departure times for the Lesser Snow Goose?
- Unit of analysis: Goose flock
- Data: The dependent variable is the time the flock leaves its roost (in minutes before or after sunrise). The research variable is the ambient temperature, measured in degrees Celsius. The control variables used are relative humidity (values between 51 and 100%), light intensity (values between 5.0 and 14.2), and cloud percentage (values between 0 and 100%).

Problem: The Jawbone of a . . . Rabbit? [[5]]

- RQ: What is the effect of age on the length of a jackrabbit's jawbone?
- Unit of analysis: Jackrabbit
- Data: The dependent variable is the length of the jawbone (in mm). In this data, it ranges from 15.5 to 50.7mm. The independent variable is the age of the jackrabbit (in years). In this data, the age ranges from 0.01 to 3.65 years.

Problem: Terror in a Tiny Town [[5]]

- RQ: What is the effect of the level of democracy on the probability that a politically violent group will use terrorism?
- Unit of analysis: Politically violent group
- Data: The dependent variable is whether or not the group used terrorism that year (2002). The research variable is the democracy level of the State (ranging from -10 to 10). The control variables are the State's stability (in years since last coup), the economic strength of the State (in percent change of GDP from last year), and number of ethnic groups in the State (ranging from 1 to 15 for this dataset).

Problem: Taking the Initiative is a Crime? [[5]]

The `crime` data file (which we have used in the past) has one count variable in it: `inituse`. This variable measures the number of times a state used the Citizens' Initiative process to pass a law. You may want to get a feel for which states use it heavily and which states do not use it at all. You may also want to browse Wikipedia for a little background on the Citizens' Initiative.

I would like to predict the number of times a given state uses the initiative process. The research literature suggests the following: States that have a legislature with a higher level of professionalism (`profleg`) should use the initiative process more often. States with a unified government (`unifGOVT`) will use the process less. States which have a Moralistic dominant culture (`cult_dom`) should use it more. States with a higher average level of education (`waea90`) should also use the initiative process more often.

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Here is the information about the state of interest:

Variable	Value
`profleg`	0.16
`unifGOVT`	1.00
`cult_dom`	Moralistic
`waea90`	64.3

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Now, for your question:

What is the predicted number of times this state uses the initiative process?

Remember to model using the correct family (you will have to check which should give the best fit), predict from the model, and back-transform it using the correct transformation. You may pare the model, if you wish.

Your answer to this problem will be a single sentence:

> *I predict that the state will use the initiative process XXX times in this decade.*

Finally, remember to submit your script as a separate file, since that file will be the most important part of this problem.