The paper

The course grade will come from the larger of the paper grade and the weighted average

.5*paper+.3*midterm+.15*homework+.05*proposal

This paper is meant to show your development as a time series analyst and to provide some fun for you. When you ask me to write a reference letter I will make serious use of your paper.

Think broadly about which data set you will work with. These days statisticians get to work on basically anything and contemporary computing packages and devices make the work easier, often leading to discoveries.

The Data. The data are meant to be from a time series, univariate or bivariate. Think of something you are interested in, be it: biology, physical science, social science, finance, sports, engineering, daily life, government, whatever. All of these subjects lead to time series data and in many cases the data are available quite directly via internet search engines, eg. Google.

Your work will be most direct if you obtain at least say 250 successive, equispaced observations. It is recommended that the series appear approximately stationary.

Using the **statistical package R** complete the following analyses, minimally.
1. Graph the data.
2. Detrend as appears necessary.
3. Carry out both a time-side analysis and a frequency-side analysis or a hybrid.
4. Check the assumptions. If a time-side model has been fit then a periodogram of the residuals can be helpful.
5. Draw conclusions/make inferences, stating the final model clearly..
6. Remember to include statistical uncertainties going along with the estimates.

The Paper
a) Have title and sections: Introduction, the Data, …, Conclusions, References
b) Describe the data and source.
c) Start with *"The scientific question motivating my work is … ."*
d) For each of the analyses discuss the results. Do not simply cut-and-paste computer output. Highlight your final models.
e) Include pertinent figures and programs.
f) End with *"The answer to my question is …"*

g) Include pertinent figures and programs.
h) Have the write up at most 10 pages long, typed, point size 12, double-spaced, margins 1". Figures are to be included in those 10 pages. (I will not be reading past page 10.)
i) Include code after page 10 if you wish. It would be examined if a serious error appears in the work.
j) Please leave a hard copy of your paper in 367 Evans or slide one under my office door, 417 Evans.
The paper is due any time before by 2:00pm Monday December 14.