

# Preliminary Project Proposal

## Math 518 - Mathematical Modeling and Applications

### Spring 2006

Your preliminary project proposal is due on 2/9. I would like you to provide me with a minimum of three ideas for your project. At this stage, you need not have your ideas fully developed; yet you should be able to describe each idea in a brief statement. Your proposal should be typed and formatted as below. For example:

**Project Idea #1:** In this project we explore the effects of ice melting on the geography of the United States. In particular, we investigate how the geography changes as a function of the amount of polar ice melted. Examples of questions considered are: What major cities are submerged? When? What happens to low-lying areas such as Death Valley?

**Project Idea #2:** In this project we investigate *palindromic numbers*. An integer is considered palindromic if it is the same when written forwards or backwards. We review the known properties of palindromic numbers and attempt to answer open questions such as: Does the palindrome reversal algorithm terminate for all integers? (In this algorithm one starts with an integer and adds to it the reversal until a palindrome is reached.)

**Project Idea #3:** In this project we study the topology of the Amazon.com “Customers who bought this book also bought” referral system. That is, we start with a random book and assign it to a vertex in a graph. For each book listed under “Customers who bought...” we assign a vertex and draw an edge between our initial book and the referred books. Following these links we construct a graph. What is the topology of the resulting graph?

A few resources for ideas are:

<http://mathforum.org/teachers/mathproject.html>

<http://www.nku.edu/~longa/SciFair/scifair.html>

<http://www.ics.uci.edu/~eppstein/junkyard/>

The Mathematics Teacher

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