Ma 330 Final Project (Fall 2016) Information

The Final Project will be due at the end of the semester **on Tuesday December 12, before Noon** (the official day of the final exam). However, I would appreciate if you can submit it ahead of time.

This project will have the following structure:

- The final project may be done by groups of size at most 4. The groups can be different from the midterm groups. The new groups must be settled by Wed. November 2.
- The project is expected to be at least **15 double spaced pages.**
- The final project will **concentrate more on "Mathematics",** even though it will have a historical content. Thus, I expect to see the following parts in it:
    - Introduction to a mathematical topic of historical interest. This may concentrate on the work of an individual mathematician or on a topic central to some branch of mathematics.
    - Outline of some key theorems or calculation techniques. Include precise definitions and proofs as needed. In case of calculation techniques, include detailed instructions that a reader can follow. Thus, terminology must be explained and motivation provided.
    - The accuracy of the mathematical parts is important. The grade of 100 points for the final will be split as 50 points for the exposition and 50 points for the mathematical content. I will be happy to preview your work (especially mathematics) ahead of time.
    - Give sample applications or solution of problems as appropriate.
    - Give a summary of possible applications or ideas for further investigations. Give a motivation for why one should study it further.
- The first action needed is to settle on a group and a topic. The second action is to submit your choice of topics. Your choices should be submitted no later than November 8.

If different groups end up choosing identical topics, then I will contact you for adjustment. Usually, the group that makes its choice first has priority.

- I will reserve the last week of classes for presentations of some of the selected projects in the class. These will be selected on the basis of interest in the topic and/or nice mathematics. Thus, you should have enough work done on the project by the middle of April. I should certainly have seen at least an outline of all projects by middle of April.

- Please make sure that you do not miss the last three classes, without a valid excuse. I will deduct 5 points per class for unexcused absence during the last classes. The purpose of this requirement is to ensure that all speakers get proper attention and appreciation from the class.

- Here is a list of old project topics to help your decision. Of course, I prefer to see something new!
  I would like to see a project based on some Mathematics related to your midterm project.
  Probability theory and history, Algebra in Arabic regions, Mathematics of various Mathematicians: Pascal, Newton, Fibonacci, Euclid, Euler etc. Famous theorems and their proofs e.g. Binomial Theorem, Various famous theorems of Calculus, Fundamental Theorems of – Algebra, Calculus etc. Prime numbers and theorems related to them.
  If you choose the topic of one of the big theorems, I will be happy to provide references as well as brief exposition of the relevant topic. In the past, I have discussed theorems on transcendence of e, π etc., gaps between primes, fundamental theorem of Algebra, quadratic reciprocity etc. I would appreciate an early request, if any.