

COVER PAGE
Project 1
Due March 21, 2018

Grading: 1. _____
 2. _____
Total _____

Deductions: Format _____

 Calcs _____

 Code _____

 Neatness _____

Comments:

GENERAL PROJECT PROCEDURES

Communication of the results of a calculation is very important. To emphasize this skill, all projects will use the following format and be stapled in the upper left corner.

REQUIRED FORMAT

1. Cover Page
2. Problem 1: All answers, figures, tables, and graphs clearly labeled.
All calculations clearly labeled with clear written explanations in full paragraphs.
3. Problem 2: All answers, figures, tables, and graphs clearly labeled.
All calculations clearly labeled with clear written explanations in full paragraphs.
4. Appendix: Computer Implementation: All generating code clearly labeled.

Details for project

1. Use the existing **Cover Page** and type your name.
2. Answer **all** elements described in the problem. Be concise but thorough.
3. Provide a clear discussion of the problem, and detail how you obtained your answer.
4. Write all answers in complete sentences and well-structured paragraphs.
5. Include figures/diagrams and graphs to support your work with the figures and graphs properly labeled.
6. Note the numerical algorithms used in your text, then provide well-documented MatLab programs in the Appendix.

Specifics for this Project

1. Problem 1:

- Write an introductory paragraph highlighting information given.
- Create a figure defining key elements, coordinates, and known quantities in the problem.
- List formulas defined by figure, writing a brief clear description of how the formulas arise.
- Show nonlinear formula from which class techniques can be applied.
- Describe method used and why in a brief paragraph. (Provide code in Appendix.)
- Write a summary of these results, including convergence of your method.
- Create a table showing all possible combinations of the errors in the measurements and how it affects the radius calculation.
- Write a summary paragraph for the error analysis, including the maximum error.
- Write a summary paragraph for this problem.

2. Problem 2:

- Write an introductory paragraph highlighting information given, including some background on the logistic growth model.
- Discuss how changes in the parameters affect behavior of the model.
- To date our numerical methods can only solve for functions of one variable, so show algebraically how to reduce to an equation in only one parameter.

- Describe the method used to solve this equation and why a particular method is chosen in a brief paragraph. (Provide code in Appendix.)
- Write a summary of your results, including convergence of your method and how you selected initial guesses.
- Write the best model through the specified data.
- Perform the required error analysis with a brief paragraph explaining your observations about the predictions, including the limiting population.
- Create a graph with appropriate axis labels and a descriptive caption.
- Write a brief paragraph about your observations of the graph of the model compared to the data.
- Suggest how a better model might be fit to the data both from a modeling perspective and numerical routine (without full details).
- Write a summary paragraph for this problem.

Grading

Students are allowed up to **3** submissions (second and third will be a week following return of project). If the project follows the guidelines above, then a grade will be assigned and you may accept the grade or resubmit for a higher grade. Any resubmission requires the inclusion of the previous graded version stapled to the back. All parts of the project must be typed (generally \LaTeX or Word) or it will not even be considered for a grade. If the project is missing more than **5** of the elements listed above, then again it will not be looked at and simply returned as unacceptable. If the project is sloppy and hard to follow (within the first page), then it will be simply returned as unacceptable. This document is expected to have a quality that you would present to someone for a job interview and graded in that light.