Some slides are derived from slides presented by Leslie C. Perelman Feb. 28, 2001
Documentation and Precision

- Documentation solidifies ideas and procedures.
  - For you the designer and others

- Documentation is a record of the project.
  - For further changes
  - For debugging or troubleshooting

- Sloppy facts and lack of precision can destroy things.
  - Confusion over units of measure destroyed a MARS lander.
  - NASA designers used metric units: newtons per second for thrust.
  - Lockheed Martin builders programmed the thrust in pounds per second.
  - The craft was about 60 miles (96 km) off course and went into oblivion.
Elements of a 6.111 lab report

- Title
- Abstract
- Table of Contents
- List of Figures and Tables
- Overview
- Description
- Testing and Debugging
- Conclusions
- Appendices

Read appropriate sections in The Mayfield Handbook.
How to Write the Report

Write it in stages.

- Title
- Overview
- Figures
- Tables
- Description
- Testing and Debugging
- Conclusion
- Appendices
- Lists of Tables and Figures
- Table of Contents
- Abstract – Note that this is written last.
Report Components

- **Title** – Entice a reader into going further.
  - Don’t use “Lab 2” or “report 1224”.

- **Overview**
  - Describe briefly the device’s use. What does it do?
  - Use. How does one use it?
  - Subsystem organization.
  - Give a plan or road map for the report.

- **Figures** – Use a template and straight edge or a graphics program.
  - Circuit diagrams convey information about design elements, making building, testing, and debugging easier.
    - Information flows in normal reading order.
    - Label all signals.
    - Show connection points with a dot.
    - Omission of a dot implies no connection. Do not use a “hop-over”.
Figures (continued)

- Timing diagrams show cause-and-effect relationships.
  - Show only relevant signals. Label them.
  - Include a clock signal in synchronous systems.
  - Abbreviate data bus contents.
  - Usually, do not show propagation delays.

Description

Describe the device in enough detail so a skilled engineer can understand, replicate, and verify your results.

- Give functional specifications.
- Describe, in detail, how the design works, i.e., how the design implements each function.
- Organize the design description to mirror the organization of the design itself.
- Document fully any non-standard, clever, or hack design elements, both to help others understand and to help you remember why you did this.
- Illustrate with tables and figures. Organizing the figures and then describing them is a good way to create your description.
- Put detailed logic diagrams, VHDL code, etc., in appendices.
Testing and Debugging
- Describe the procedure for testing each subsystem.
- Describe what you did to get each subsystem to work, i.e., how did you go about fixing problems.
- If you couldn’t get all functions to work:
  - Describe which subsystems did work and to what extent.
  - If you fixed a problem, describe how.
  - If you didn’t fix it, describe the problem and what your next testing and debugging steps would have been.

Conclusion
- Summarize the most important or innovative design features.
- Describe (briefly) the test results.
- Discuss problems with your initial design and the solutions you implemented.
- Suggest improvements to the design (and specification).

Abstract
- In one paragraph, describe your project and the results.
- Do not say what is contained in each section of the report,
Check the spelling.

- Read your report over again.
  - Hand written corrections are ok (if legible).