The project will be graded based on the code and the final report. The final report will have sections similar to the interim reports, but written as a report. The required sections are described below, along with grading criteria. The code grading criteria are also provided.

The report is due EARLY Monday morning. This is a hard deadline since course grades are due soon afterward. Feel free to submit drafts of the report, as well as of the project code early for comments.

**Project Overview**

Length: About two paragraphs. Purpose: Let reader know scope of what was done and interesting things to pay attention to in the remainder of the report. Grading Criterion: Concise, yet lets reader know what simulation will do, what it does well, and why it’s interesting.

Provide an overview of what your project does and any specific goals. Point out things that it does well such as physics modeling or graphics (be specific). Describe what it is that will keep the user interested in “playing” with the simulation.

**Simulated World, User Interaction, and Behavior**

Length: Several pages. Purpose: Describe details of what is being modeled and how user interacts with it. Grading: Description is complete and at an appropriate level of detail.

Start by stating what the project will be modeling, then get into specifics about the physical objects, how they move and what physics is being simulated. Leave the physics details for the next section.

Describe user interaction, including the keys that are used, and how that affects the physical model (e.g., changing the position of an object, changing the speed, or applying a force [three different ways a user can move something]).

Describe what is interesting about the behavior, what the user might look for, or what might be the high point of a demonstration.

**Physics and Modeling**


Start by indicating physical state, especially dynamic state. Focus on important parts of the physical state (position, velocity), and avoid redundant items.

Briefly describe how each static object (item that doesn’t move) is modeled, and how collisions are detected. Emphasize representations that allow many objects to be represented using the same struct or class.

Indicate the physics used to compute the next state. This might include the exact equations of motion, followed by the computations actually performed in the time step. If the penetration\_balls\_resolve is used then explain the linear forces used in that routine (including elasticity), only describe rotational forces if that is of particular importance.

Describe limitations of the physics. What would happen in a real system that is not being modeled, if anything.

Emphasize anything interesting or clever about the physics and modeling, such as physics tuned to match simulated behavior to the real thing.

**Graphics**

Describe the items to be rendered, the OpenGL primitives used, and comment on realism. Indicate any special attention paid to textures, lighting, or the shapes needed for realism or some other purpose.

Indicate any elements of appearance that are not captured in the graphics, and suggest improvements.

**Code and Code Overview**

Length: About one page (code overview). Purpose: Describe interesting parts of code. Grading: For overview, clarity. For code, see below.

The project report should include an overview of the added code. Describe where things are done (in which routines), and any special techniques to improve speed or code compactness. Code fragments may be used to illustrate things, but there is no need for a complete listing in the report. Instead, provide (email) the code with your report.

The code itself will be graded based on the following criteria:

- Clear and easy to read.
- Uses well-chosen variable and procedure names.
- Avoids convoluted control flow.
- Written for speed: avoid redundant calculation, linear searches, etc.
- Makes good use of OpenGL and coordinate classes.