

CS 460/594 — Project Assignment 1

Project Design

You need to decide what type of interactive, graphical application you want to design and implement this semester. At this point you only have to settle on a project and give us a brief description of what it will do. For example:

I plan to implement a visual debugger for tree algorithms. The debugger will display a visual representation of a tree that is similar to the visual representations used in instructional texts. As a program executes and creates or deletes tree nodes, the visual debugger will automatically update the tree's visual representation.

The visual representation will display:

1. Tree nodes, the key data associated with each node (e.g., the keys at a node) and the links from each parent to its children.
2. The names of pointer variables and the tree nodes to which they point.
3. The names of ordinary variables and their values (e.g., integers, strings, etc.).

The visual debugger will provide a library of objects, such as visual tree nodes, visual pointer variables, and visual variables, that a programmer can use in their program. These objects will not only contain the current value of a variable or tree node but also be able to display its value on the screen.

The user of the visual debugger will be able to:

- move around nodes and have their links and the pointer variables that point to them automatically follow them.
- move around ordinary variables and pointer variables (the screen location of the pointer variables will move but they should still point to the same tree node).
- select pointer variables or ordinary variables and make them invisible.
- select the names of invisible pointer variables and ordinary variables from a list and make them visible.
- control the increments in which the program is executed (e.g., run to completion, run to the next significant graphical event, run until a pointer variable points to a node with a certain set of contents).

The application you propose should have a strongly graphical, direct manipulation component. It should also involve custom application objects and have some dynamic behavior. In other words, the interface to the application should not consist completely of widgets, such as menus and scroll bars, and static bitmaps. Instead, the interface should have some objects that are composed from graphical primitives, such as rectangles, lines, and circles, and whose properties change in response to changes in the application data (e.g., line style, filling style, color, size, font, etc). Example applications might be games, drawing editors, layout editors, visual languages, process monitors (e.g., monitoring the operations on a factory floor), simulation editors, or a graphical front-end to some type of application (the visual debugger described above is an example of a graphical front-end to an application). In the past student projects have included a landscape editor, an educational application for a student's children, front-ends to student projects in other courses, front-ends to some graduate or research project, and various types of games.

The application should have:

1. a few types of objects (e.g., the visual debugger has tree nodes, pointer variables, ordinary variables, and links between tree nodes),
2. a few types of behaviors (e.g., the visual debugger has the five behaviors described above), and
3. if you are a graduate student, then some form of animation or be a multi-user application. If you are an undergraduate then animation or a multi-user application can be an extra credit option worth up to an additional 20 points.

We want something interesting, but manageable. The application should not require a great deal of code to implement the model, or if it does, then the model development should be part of another effort, such as a research effort or a project in another course.

For this assignment, prepare a brief description (the above description for a visual tree debugger would be adequate) and list the people who will be working on the interface. It is not necessary to include sketches of your graphical application with your description. You will prepare sketches in your next assignment. This assignment will not be graded. We will simply indicate whether it is acceptable, needs modifications, or needs to be completely rethought.