The Graphics Window
Lecture 1
Chapter 1; Sections 2.3, 2.7

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Outline

1. The GLUT Library
2. Assignment
Definition (Device-independent)

A library is **device-independent** if it provides a common API, regardless of the hardware on which it is used.

- The OpenGL API for Windows is identical to the OpenGL API for the Macintosh.
- Of course, the library must be compiled separately for each hardware system.
OpenGL consists of three libraries

- **gl** - graphics library
  - Basic functions.
  - All function names begin with `gl`.

- **glu** - graphics library utility
  - Composites of basic GL functions.
  - All function names begin with `glu`.

- **glut** - graphics library utility toolkit
  - Functions that interact with the windowing system.
  - All function names begin with `glut`.
```c
int main(int argc, char* argv[])
{
    glutInit(&argc, argv);
    glutInitDisplayMode(GLUT_DOUBLE | GLUT_RGBA);
    glutInitWindowSize(screenWidth, screenHeight);
    glutInitWindowPosition(100, 150);
    glutCreateWindow("window title");

    glutDisplayFunc(display);
    glutReshapeFunc(reshape);
    glutKeyboardFunc(keyboard);
    glutMouseFunc(mouse);

    init();
    glutMainLoop();
    return 0;
}
```
main() uses the glut functions to set things up and get started.

Functions used to create a graphics window.

- glutInit()
- glutInitDisplayWindow()
- glutInitWindowSize()
- glutInitWindowPosition()
- glutCreateWindow()
GLUT-Based Programming

- `glutInit(&argc, argv)`
  - Initializes the glut library.
  - Must be called before any other glut function.
  - Must receive the command-line arguments.

- `glutInitDisplayWindow(options)`
  - Specifies single or double buffering.
  - Specifies color mode.
GLUT-Based Programming

- `glutInitWindowSize(width, height)`
  - Sets the height and width of the window in pixels, not counting the frame.
- `glutInitWindowPosition(x, y)`
  - Sets the position of the upper left corner of the window.
- `glutCreateWindow(name)`
  - Creates, but does not display, the window.
Creating a Window

Example (The Graphics Window)

- The code.
- The executable.
Homework

- Read Chapter 1 for an overview of computer graphics.
- Read Section 2.3 – the libraries.
- Read Section 2.7 – the GLUT window functions.