2.7 Control Functions (interaction with windows)

- Window – A rectangular area of our display.

- Modern systems allow many windows to be displayed on the screen (multiwindow environment).

- The position of the window is with reference to the origin. The origin (0,0) is the top left corner of the screen.

- `glutInit` allows application to get command line arguments and initializes system

- `gluInitDisplayMode` requests properties for the window (the rendering context)
  - RGB color
  - Single buffering
  - Properties logically ORed together

- `glutWindowSize` in pixels

- `glutWindowPosition` from top-left corner of display

- `glutCreateWindow` create window with a particular title

Aspect ratio and viewports

- Aspect ratio is the ratio of width to height of a particular object.

- We may obtain undesirable output if the aspect ratio of the viewing rectangle (specified by `glOrtho`), is not same as the aspect ratio of the window (specified by `glutInitWindowSize`)

Viewport – A rectangular area of the display window, whose height and width can be adjusted to match that of the clipping window, to avoid distortion of the images.

```c
void glViewport(GLint x, GLint y, GLsizei w, GLsizei h);
```
The main, display and myinit functions

- In our application, once the primitive is rendered onto the display and the application program ends, the window may disappear from the display.
- Event processing loop:
  - `void glutMainLoop();`
- Graphics is sent to the screen through a function called **display callback**.
  - `void glutDisplayFunc(function name)`
- The function `myinit()` is used to set the OpenGL state variables dealing with viewing and attributes.

Control Functions

- **glutInit**(int *argc, char **argv) initializes GLUT and processes any command line arguments (for X, this would be options like -display and -geometry). `glutInit()` should be called before any other GLUT routine.
- **glutInitDisplayMode**(unsigned int mode) specifies whether to use an RGBA or color-index color model. You can also specify whether you want a single- or double-buffered window. (If you’re working in color-index mode, you’ll want to load certain colors into the color map; use `glutSetColor()` to do this.)
- **glutInitDisplayMode**(GLUT_DOUBLE | GLUT_RGB | GLUT_DEPTH).
- If you want a window with double buffering, the RGBA color model, and a depth buffer, you might call
  - **glutInitWindowPosition**(int x, int y) specifies the screen location for the upper-left corner of your window
- `glutInitWindowSize(int width, int size)` specifies the size, in pixels, of your window.
- `int glutCreateWindow(char *string)` creates a window with an OpenGL context. It returns a unique identifier for the new window. Be warned: Until `glutMainLoop()` is called.