|  |
| --- |
| xw =( xnd +1  width/2 + x |
| yw = ( ynd + 1 ) height/2 + y |

Viewport width and height are silently clamped to a range that depends on the implementation. To query this range, we call the Glgetinteger with argument *GL\_MAX\_VIEWPORT\_DIMS.*

* **void glutInit (int \*argc, char \*\*argv):**

glutInit will initialize the GLUT library and negotiate a session with the window system. During this process, glutInit may cause the termination of the GLUT program with an error message to the user if GLUT cannot be properly initialized. Examples of this situation include the failure to connect to the window system, the lack of window system support for OpenGL, and invalid command line options. glutInit also processes command line options, but the specific options parse are window system dependent.

* **void glutReshapeFunc (void (\*func) (int width, int height)):**

GlutReshapeFunc sets the reshape callback for the current window. The reshape callback is triggered when a window is reshaped. A reshape callback is also triggered immediately before a window's first display callback after a window is created or whenever an overlay for the window is established. The width and height parameters of the callback specify the new window size in pixels. Before the callback, the current window is set to the window that has been reshaped.

If a reshape callback is not registered for a window or NULL is passed to glutReshapeFunc (to deregister a previously registered callback), the default reshape callback is used.

* **glOrtho ( ):**

Syntax: *void glOrtho ( GLdouble left, GLdouble right, GLdouble bottom, GLdouble top, GLdouble near, GLdouble far);*

The function defines an orthographic viewing volume with all parameters measured from the center of the projection plane.