

3.5 Display Lists And Modeling

- Building hierarchical models involves incorporating relationships between various parts of a model

```
#define EYE 1                                glTranslatef(.....);
                                           glCallList(EYE);

    glNewList(EYE);
    /* code to draw eye */
    glEndList();

# define FACE 2
    glNewList(FACE);
    /* Draw outline */
    glTranslatef(.....)
    glCallList(EYE);
```

3.6 Programing Event Driven Input

- Pointing Devices :

A mouse event occurs when one of the buttons of the mouse is pressed or released

```
void myMouse(int button, int state, int x, int y)
```

```
{
    if (button == GLUT_LEFT_BUTTON && state == GLUT_DOWN)
        exit(0);
}
```

The callback from the main function would be :

```
glutMouseFunc(myMouse);
```

Window Events

- Most windows system allows user to resize window.
- This is a window event and it poses several problems like
 - Do we redraw all the images
 - The aspect ratio
 - Do we change the size or attributes of the primitives to suit the new window

```
void myReshape(GLsizei w, GLsizei h)
{
    /* first adjust clipping box */
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(0.0,(GLdouble)w, 0.0, (GLdouble)h);
    glMatrixMode(GL_MODELVIEW);
    glLoadIdentity();

    /* adjust viewport */
    glViewport(0,0,w,h);
}
```

Keyboard Events

When a keyboard event occurs, the ASCII code for the key that generated the event and the mouse location are returned.

E.g.

```
void myKey(unsigned char key, int x, int y)
{
    if (key=='q' || key=='Q')
        exit(0);
}
```

Callback : `glutKeyboardFunc(myKey);`

- GLUT provides the function **glutGetModifiers** function enables us to define functionalities for the meta keys

The Display and Idle callbacks

Interactive and animation programs might contain many calls for the reexecution of the display function.

- `glutPostRedisplay()` – Calling this function sets a flag inside GLUT's main loop indicating that the display needs to be redrawn.
- At the end of each execution of the main loop, GLUT uses this flag to determine if the display function will be executed.
- The function ensures that the display will be drawn only once each time the program goes through the event loop.
- Idle Callback is invoked when there are no other events to be performed.
- Its typical use is to continuously generate graphical primitives when nothing else is happening.
- Idle callback : `glutIdleFunc(function name)`

Window Management

- GLUT supports creation of multiple windows
- `Id = glutCreateWindow("second window");`

- To set a particular window as the current window where the image has to be rendered
`glutSetWindow(id);`

Source : <http://elearningatria.files.wordpress.com/2013/10/cse-vi-computer-graphics-and-visualization-10cs65-notes.pdf>