

openGL API's

② Initialization & setup :

- glutInit()
- glutCreateWindow("title")
- glewInit()

② Drawing primitives:

- glBegin(GL_TRIANGLES) --- glEnd()
- glDrawArrays(), glDrawElements()

③ Transformations:

- glTranslatef(x, y, z);
- glRotatef(Angle, x, y, z);
- glScalef(x, y, z);

④ Coloring and Texturing:

- glColor3f(r, g, b);
- glTexImage2D();

⑤ Shading and lighting:

- glEnable(GL_lighting);
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⑥ Buffer operations:

- glFlush(); displays the rendered image

APIs for Rendering

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1. **GL (OpenGL) :** core graphics API.
2. **GLU (OpenGL Utility Library) :** Helper function for OpenGL.
3. **GLUT (OpenGL Utility Toolkit) :** windowing & user input management.

① GL Functions

- **glBegin(GL_TRIANGLES) --- glEnd();** ; Defines primitive shapes
- **glColor3f(r,g,b)** ; sets colors
- **glVertex3f(x,y,z)** ; Defines a vertex
- **glTranslatef(x,y,z)**
- **glRotatef(angle, x,y,z)**
- **glScalef(x,y,z)**

② GLU

- **gluOrtho2D(left, right, bottom, top).**
- **gluPerspective(fov, aspect, near, far)**
- **gluLookAt(leye, eyeY, eyeZ, centerX, centerY, centerZ,
upX, upY, upZ)**
- **glusphere(), glutylinder()**

③ GLUT:

- **glutCreateWindow("OpenGL Window")**
- **glutDisplayFunc(displayFunc)**
- **glutKeyboardFunc(keyboardFunc)**
- **glutMouseFunc(mouseFunc)**
- **glutMainLoop()**

Lighting → glLightfv (light, pname, params)

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callback functions

↳ used via glut

- glutDisplayFunc (display)
- glutKeyboardFunc (Keyboard)
- glutReshapeFunc (reshape)