Advanced Computer Graphics Project #4: Vertex Buffer Objects

- ❖ Extend the project three to display using Vertex buffer objects (VBO)
- ❖ Create a cube model that described in WaveFront obj (Cube.obj) file
- ❖ follow the steps
  - Read 'v' for vertices and record x y z values : ex 'vertexData'
  - Read 'vn' for vertex Normal and record x y z values
  - Read 'f' for faces and record indices array for vertices and normal of each polygon
  - Fill out the normalData and Colorarr Arrays

    Note: These will length 3x of the number of faces
- ❖ Create VBO : Use the following
  - glGenBuffersARB(1, vbo);
  - glBindBufferARB(GL_ARRAY_BUFFER_ARB, *vbo);
  - glBufferDataARB(GL_ARRAY_BUFFER_ARB,size,0,GL_DYNAMIC_DRAW);

    // size will be the total size of normal and vertices data structure
  - Bind 'vertex' Data and 'normal' Data

    Ex: glBufferSubDataARB(GL_ARRAY_BUFFER_ARB,0,(Numberofvertices)*(sizeof(*VertexData)),VertexData);

    // note: To bind normal Data replace '0' by the length of your VertexData size
  - glBindBuffer(GL_ARRAY_BUFFER_ARB,0);
- ❖ Display Model: Use the following
  - glEnableClientState(GL_NORMAL_ARRAY);

    glEnableClientState(GL_COLOR_ARRAY);

    glEnableClientState(GL_VERTEX_ARRAY);

    ex:
  - glNormalPointer(GL_FLOAT,4*sizeof(float),(void *)((Numberofvertices)*sizeof(*VertexData)+(Numberofvertices)*sizeof(*colorsarr)));
  - glColorPointer(4,GL_FLOAT,0,(void *)((Numberofvertices)*sizeof(*VertexData)));
  - glVertexPointer(4,GL_FLOAT,0,0);
- ❖ Draw the scene using the following format & follow the given key setup

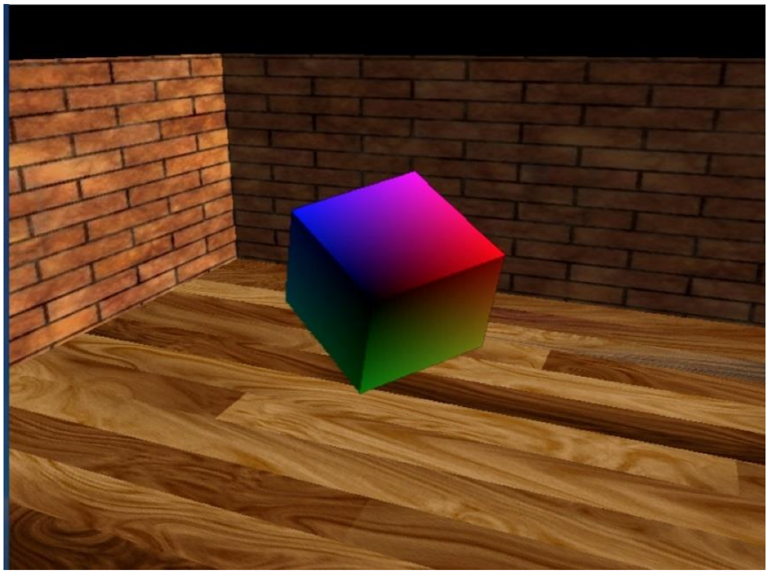
```
glBegin(GL_TRIANGLES);

glArrayElement(Indices[i])
glArrayElement(Indices[i+1])
glArrayElement(Indices[i+2])

glEnd();

// 'indices' contains only face index of each triangle

glDisableClientState(GL_COLOR_ARRAY);
glDisableClientState(GL_NORMAL_ARRAY);
glDisableClientState(GL_VERTEX_ARRAY);
```



Include your *Name*, *ID*, *Class* and *Project Name* at the top of the code. Please comment your code describing what each of your code line dose. Save the file as "projectXX.cpp"