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**The Aquarium:**

* The attached screenshots are with a higher resolution of files, I had to compress them for submission.
* If you get lost while rotating the scene (center of scene is center of inner skybox), use *w* to activate wireframe.
* I am using a modified version of ply.h

I have added

typedef struct Vertex {

float x, y, z;

float nx, ny, nz;

};

typedef struct Face {

unsigned int count;

unsigned int \*vertices;

float nx, ny, nz;

};

to the end of ply.h (declaration of these structs in header file)

* Files attached (hard coded, no changes in command-line arguments):
  + display.cpp – main function
  + ply.h – modified header file
  + ply.c, plyread.cpp – to store value of ply models in the arrays
  + shark3.ply, hammerhead3.ply and dolphins3.ply – the 3 ply models used with generated normals
  + shaderSetup.cpp, shaders.vert, shaders.frag – GLSL
  + flip normal.txt and generate normal.txt – NOT used in the code, ply models with already generated normals
  + 1.ppm to 6.ppm (inner skybox textures)
  + 1c.ppm to 6c.ppm (inner cube for reflection)
  + o1.ppm to o6.ppm (outer skybox textures)
  + o1c.ppm to o6c.ppm (outer cube for reflection)
  + Lab\_5.sln – Visual Studio solution file
  + Screenshot 1.png, Screenshot 2.png, Screenshot 3.png

If I skipped some file by mistake and the program is not able to run please let me know!

* Controls:
  + To get reflective spheres in center of both skyboxes, change value of global variable at line display.cpp : 24 to 1.
  + To get reflection of environment in fishes, set value of reflection at line display.cpp : 25 to 2.
  + Animation to get the fish moving: *1 – start and 2 – stop.*
  + Rotate camera frame: *Left click* mouse and drag. The light position does not change.
  + Scale the scene: *Right click* mouse and drag.
  + Enable and disable wireframe : *w*
  + Control light properties-
    - Position (its local axes)-
      * +x-axis: *k*
      * -x-axis: *h*
      * +y-axis: *u*
      * -y-axis: *j*
      * +z-axis: *m*
      * -z-axis: *n*
    - Intensity-
      * Increase ambient: *A*
      * Decrease ambient: *a*
      * Increase diffuse: *D*
      * Decrease diffuse: d
      * Increase specular: *S*
      * Decrease specular: *s*
      * Increase shininess: *+*
      * Decrease shininess: *-*
  + Camera position-
    - Up: 3
    - Down: 4
    - Out: 5
    - In: 6
    - Right: 7
    - Left: 8
  + Restore default light properties: *q*
  + Exit window: *esc*
* Moving around the scene can be a bit messy, so if you want to see the outer box properly:

Left click and rotate in inner box till you view mountains in background, zoom out to see:

