Student's ***NetID***_____Student's Name_____Grader's Name_____
(netID == 3 letters, 3 digits: e.g. JET861 Please write clearly; make it easy to read)

CompSci 351-1 Grading Sheet: Project C Fall 2022

J. Tumblin 11/09/2022

_____**10% In-Class Interactive Demo.** Demonstrates multiple items listed on this page.

_____**5% Filenames, PDF report:** All file-naming correct + clear illustrated PDF report including name, netID, title, goals, user-guide, >= 4 results pictures, + correct sketch of your program's scene-graph (required) showing all its transforms (2pts).

_____**5% Sensible, Complete On-screen User Instructions:** Program's on-screen display allows new users to quickly and easily identify and use all the programs features and options, without any extra help from source code, report, or authors' explanations.

_____**5% Ground-Plane Grid:** Project shows horizontal 'floor' or 'terrain' of repeated shapes or lines that extend nearly endlessly to all distant horizons, and thus let us easily assess changes to camera position and aiming direction.
In the world coordinate system where +z is 'up', the ground plane at z=0 spans x,y coords that appear horizontal on-screen.

_____**10% ≥3 Solid, Separate, Jointed, Continually Flexing Shapes with Diffuse Shading or Better:**
3D shapes at separate, different ground-plane locations, with continually-changing joint angles. Wireframe *not* acceptable!

_____**5% Large, Slowly-spinning Sphere** at world-space origin to visually confirm all lighting and shading methods. Sphere is easily viewable and easily lit from any desired 3D location. Rotation helps reveals faceted/smooth effect of Gouraud/Phong shading.

_____**5% Single-Viewport Display fills top 66% of browser window of any shape.** Browser window resizing always keeps it filled with an undistorted image from a perspective camera with 30-degree vertical field-of-view; no shape distortions, no blank areas allowed except a fixed-height fixed-width border && a region to hold HTML buttons, text, edit boxes etc.; no browser 'slider bars'!

_____**5% Smoothly adjustable 3D View Control:** User interaction for unrestricted viewpoint control: be able to aim camera in any direction without changing position: be able to move forward/backward in the gaze direction, and 'strafe' sideways left/right from any 3D position; (HINT: 'glass cylinder' method; mouse or arrow-key aiming (tilt/yaw) and WASD to move fwd/rev, strafe left/right).

_____**10% 3 or more obviously different-looking Phong Materials** used on different rigid 3D parts.
'Phong' materials have specified RGB values for ambient, diffuse, specular and emissive terms.
HINT: use materials parameters given in starter code file "`materials_Ayerdi04.js`"

_____**10%** One or more **user-adjustable, non-directional 3D light source.** Users can interactively set world-space position, switch light on/off, and set separate R,G,B values for each of the ambient, diffuse, and specular light amounts. Surface illumination from this light must NOT change when camera moves. (note that specular highlight position *will* appear to shift as the camera moves).

_____**10% Interactive switching between all available lighting/shading methods** (requires at least two to earn this credit) without stopping or disrupting the program or its on-screen display.

_____**20% ≥Four lighting/shading methods:** Users can interactively select between Gouraud Shading and Phong Shading; for each of these, they can also select between Phong lighting and Blinn-Phong lighting; more methods welcome. Gouraud shading gives crudely-shaped highlights: Phong shading yields rounded highlights that can be smaller than triangles. Blinn-Phong lighting and Phong lighting yield slightly different specular highlights. (HINT: use different GLSL shaders for Gouraud and Phong shading)

EXTRA CREDIT:

_____2% extra credit: user-switched materials for ≥ one 3D part. (>10 visually distinct mat'l choices; no effect on other 3D parts),
_____2% extra credit: 3 or more user-selected distance dependencies (ATT) for your light sources:
(must include choice between NONE, 1/dist, and $1/dist^2$, with dist calc'd at each vertex; must work correctly)
_____4% extra credit: A second, 'headlight' light-source, co-located at camera eyepoint, that users can switch on/off
(when correct, the specular highlights stay in the middle of any shiny sphere as camera moves)
_____2% extra credit: geometric shape distortions in shaders, not reproducible by matrix transforms in Vertex Shader (e.g. twist vs. z; sinusoidal waviness etc. will qualify, but simple scaling or displacement of selected vertices will not suffice)
_____4% extra credit: Simple Texture Maps on surface of one or more 3D parts (Chap 5-like; emissive-only shading is OK).

_____**TOTAL POINTS/100** (30% of final grade)