

Student's *NetID* \_\_\_\_\_ Student's Name \_\_\_\_\_ Grader's Name \_\_\_\_\_

## 2014 Winter EECS 351 Grading Sheet: Project B

J. Tumblin 2014.02.13

- \_\_\_\_\_ **10% Report:** clear illustrated PDF file report with your name project title, goals, user-guide, and example/results pictures.
- \_\_\_\_\_ **5% User instructions:** 'help' key prints console or on-screen instructions that explain how to use your program.
- \_\_\_\_\_ **15% Ground-Plane Grid:** Project shows x,y ground-plane grid that extends to horizon, shown as horizontal on-screen, and lets us easily assess changes to camera position and aiming directions.
- \_\_\_\_\_ **15% Adjustable 3-Jointed, 4-Segment Shape:** draws at least one shape with least three cascaded joints, smoothly adjustable. Adjusting joints **MUST NOT CHANGE** any cameras or any views.
- \_\_\_\_\_ **10% Additional Multi-color 3D Shapes:** draws at least four more separate 3D shapes, each shape with at least 3 different vertex colors specified. (fixed, non-jointed objects OK...)
- \_\_\_\_\_ **5% 3D Axes:** Draws 3D world-space coord. axes on-screen, and at least one more set of 3D axes to depict the coordinate system used for a rotatable joint or movable part in the jointed object.
- \_\_\_\_\_ **15% 4 Viewports (3 fixed orthographic front,side,top + 1 movable projection view):** Divides display window evenly into 2x2 grid of viewports that always fill the screen and never distort (squash/stretch) the images when users re-size window for taller or wider images.
- \_\_\_\_\_ **15% Smoothly adjustable 3D View Control:** User interaction provides smoothly adjustable viewpoint control (adjust to any 3D position, and from that position, choose any 3D viewing direction) by changing GL\_MODELVIEW matrix for the 4<sup>th</sup> 'movable' projection view.
- \_\_\_\_\_ **10% Switchable 3D Camera:** Switches back and forth between a Perspective Camera and an Orthographic camera, without changing any viewpoints or viewing directions for any camera.
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- \_\_\_\_\_ **2% extra credit:** user adjustable asymmetric camera; make all 6 frustum parameters user-adjustable (left, right, top, bottom adjustments)
- \_\_\_\_\_ **3% extra credit:** Multiple Vertex Buffer Objects; each holds a different shape or set of shapes.
- \_\_\_\_\_ **3% extra credit:** 'flying-airplane' navigation controls: forward velocity; aiming by roll, pitch, yaw...
- \_\_\_\_\_ **4% extra credit:** quaternion-based 'trackball' control of orientation for at least one on-screen object. Mouse dragging must change the on-screen orientation of the object as if it were enclosed in an invisible sphere that we rotate by 'dragging' its surface with the mouse.

=====TOTAL (24% of final grade)