Practice 3 – Błażej Drozd

Video: https://youtu.be/3UjRH-ruEbE

Key implementation details

The floor can have three predefined materials (Rubber, Plastic and Polished Metal), they can be switched via a context menu.

It's possible to switch between three predefined tetures (grid – checkerboard, grass and rock), via the menu. Four texture filtering options are available, combining GL_TEXTURE_MAG_FILTER and GL_TEXTURE_MIN_FILTER with GL_NEAREST and GL_LINEAR.

Lightning

It's managed by the light class, light types has been implemented:

- Ambient
- Positional
- Directional
- Spotlight

Each light type can be activated via the context menu.

Positional and spotlight can me moved along x, y, z axes using keyboard keys (j, l, i, k, u, o) after being selected in the menu.

Light is visualized as yellow spheres.

Keyboard control

- Object Selection: 1 (cow), 2 (robot).
- Selected Object Movement:
    - Left/Right Arrows: Translation along the X-axis.
    - Up/Down Arrows: Translation along the Y-axis (up/down).
- Selected Object Rotation: X/x, Y/y, Z/z (rotation around respective axes).
- Selected Object Scaling: S (increase), s (decrease).
- Robot DoF Control (Keyboard Mode):

    - 4: Previous Degree of Freedom (DoF).
    - 5: Next DoF.
    - Up/Down Arrows: Increase/decrease active DoF value.
- Light Control: j, l, i, k, u, o (translate selected light).
- Camera Control: c/C (toggle camera mode), p/P (toggle projection), +/- (zoom), arrows (orbit in camera mode).
- Animations: a/A (toggle model animation), g/G (toggle camera animation).
- Exit: Esc.

And for summary, the project successfully integrated and extended the functionality of the previous practice. For future students, I recommend rewriting these labs in Python https://hektorprofe.github.io/opengl/01-primeros-pasos/. It works much better, without CMake issues and memory leaks.