Enhanced visualization: assignment 7

Lighting and texturing with OpenGL

I. Lighting

In this part we will study OpenGL code for rendering with lighting. Download the notebook *assignment7.ipynb* from *moodle*.

A. Lighting of a simple opaque object.

1. Run Cell #1 of the notebook and explain what it does.
2. How do you change the color of the light?
3. Add a second light with red color. This light should rotate around the z axis when you click on the right mouse button.

B. Light and different materials

1. Run Cell #2 of the notebook and explain what it does.
2. Explain the commands #1 – 4. What happens if you change the local view input variable to 1.0?
3. The teapots materials are designed to be similar to some real materials. In alphabetical order, the materials are the following:

1	Black plastic	9	Emerald	17	Red rubber
2	Black rubber	10	Gold	18	Ruby
3	Brass	11	Green plastic	19	Silver
4	Bronze	12	Green rubber	20	Turquoise
5	Chrome	13	Jade	21	White plastic
6	Copper	14	Obsidian	22	White rubber
7	Cyan plastic	15	Pearl	23	Yellow plastic
8	Cyan rubber	16	Red plastic	24	Yellow rubber

Indicate the positions in which each material is shown in the window and also the corresponding material coefficients given in the code cell.

II. Texturing

Modify the code given in Cell #3 so that the cube faces are textured with the UNS/Polytech Nice logo as you can see in Figure 1. The logo is a bitmap file *uns_polytech_logo.bmp* that you can download from *moodle*. Test it with nearest neighbor and linear interpolation.

Figure 1: Textured cube generated with OpenGL.