Assignment 03: Projection

The purpose of Assignment 03 is to learn the projection matrices and their different applications.

The different transformations should be created in file **`cameras.hpp`** and using function:

```
A->SetMatrix(int i, glm::mat4 M, bool hil)
```

The first parameter **`int i`** is an integer number between 0 and 7, which defines the case for which you want to set the projection matrix, and **`glm::mat4 M`** is the 4x4 matrix you are defining. The first projection matrix, index 0, is already in place and should not be modified. You should start working from the second projection matrix (index 2 to 7).

In particular, the eight projections should be the following:

0 - Orthogonal Front (already given)

1 - Isometric

2 - Dimetric, with an angle of ***20*** *degrees*

3 - Trimetric, with an angle of α of ***30*** *degrees*, and β of ***60*** *degrees*

4 - Create a Cabinet projection, with the *z-axis* at an angle of ***45*** *degrees*

5 - Create a perspective projection, with a *Fov-y* of ***90*** *degrees*

6 - Create a perspective projection, with a *Fov-y* of ***30*** *degrees (zoom)*

7 - Create a perspective projection, with a *Fov-y* of ***120*** *degrees (wide)*

For all the projections, the aspect ratio is supposed to be ***4:3*** (assuming the application is used on a screen with square pixels). Near plane is at ***0.1*** for perspective and orthogonal, while it is at ***-500*** for isometric, dimetric, trimetric and cabinet. The far plane is always at ***500***. For the parallel projections, the half-width of the screen in world coordinates is assumed to be ***20***.

Once you have completed all the projections, press SPACE to rotate among them and see their effect. After the last matrix has been shown, the next press of the SPACE key will save the screenshots of your results in files **`A03_1.png`** to **`A03_8.png`**. Please check that their content matches your window, as such files will be an important part of the final delivery of this assignment.

You can move the view using either the keyboard, the mouse or a game pad, using the controls below: