LAB 1

Understand PGM file.

Turning the image from 2D to 3D.

Detect the faces (voxels in which there are two colours depending on the direction of the normal vector of the face).

Taking the centre of the figure as origin of coordinates.

Store the corners, the colour and the normal vector of each face with two consecutive different colors. For doing so, comparing if colours of consecutive voxels are same. Normal Will be a unitary vector in which the values are determined by the sense in which the colour of the voxel changes.

Save all these values in a json file.

Comparison with the groundtruth file.

LAB2

Create a viewer widget

Add a button to load the file (QPushButton) that opens the current folder, that shows an error message if the file is wrong (Qmessagebox::warning) or shows the name of the correctly selected file (QFileDialog::getOpenFileName).

Add a slider (QSlider) in order to change transparency of the figure.

Load the json file with the previously calculated voxels (loadFaces), creating also a copy.

Initialize the world with defined color and lighting (initializeGL), setting the Alpha value in the middle value.

Obtain the current position of the mouse when it is pressed (mousePressEvent).

Vary the rotation or translation in the X and Y axis (mouseMoveEvent, rotation if left button of the mouse is pressed, translation if right button of the mouse is pressed).

Zoom in and out by moving the Wheel of the mouse (wheelEvent).

Speed up ten times the previous movements if the SHIFT button is pressed (ShiftModifier).

Paint the loaded elements depending on the perspective and position selected by gluPerspective and gluLookAt. Their position Will depend on the coordinates of the json file, and so Will the colour.