Task1

We bend the surface of homework3a to form a cylinder, and we changed the direction of ray casting so that the light cast radially parallel to the x0z plane. To achieve a better result, we discarded the upper parts of the texture and then added a smooth top using the bi-cubic C1 polar subdivision as described in the paper of the following link: <http://www.cise.ufl.edu/research/SurfLab/papers/06bi3pol.pdf>.

Task2

First, in order to cut holes for the eyes, we used the discard command to discard the fragments around center of the eyes in the texture.

We created two pairs of eye balls in total. One pair is fit for the surface after ray casting, and the other on is fit for the model. Each eye ball is a sphere created by the function CreateSphere(). The idea of this function comes from the online source: <http://www.swiftless.com/tutorials/opengl/sphere.html>. And we modified it a little bit to be our own. When the scene is been drawn, a first judgment is made whether we want to draw the eye. If yes, then draw the pair of eye under the current situation (whether the ray casting function has been called).

Task3

For task3, we made an animation of the face to develop a smile. A timer function is being called every 60 millisecond. A global variable of boolean type has been used to help decide whether to develop a smile. When a smile is wanted, the x, y and z position of two certain control point that controls the corners of mouth moves in a certain range. Then the smile appears and disappears alternately.

