

Exercises

Continue working with the exercises from last weeks meeting if you didn't finish them, solutions for all tasks except the extra task are published on the git repository.

Exercises

From [exercises2.pdf](#)

1. Make a program that draws a sequence of points joined together by line segments. The user should be able to click on a point with the mouse and drag it around. This program forms the basis for a later exercise involving curves. In the function `myMousePress` you need to find out which of the points in `points` is nearest the cursor, and if the point is close enough, update `selected` with the index of this point. In the function `myMouseMove` we check whether `selected` is different from `-1`. If it is then we update the point with the given index to the position of the cursor. If the user clicks on a line segment, a new point is created between the end points of the segment thus splitting the segment into two. If the user clicks with the right mouse button on a point the point is removed. You can start from the file `ex2-4_polylinemanip.cpp.template`. See also `LineSegment.hpp`

Exercises

From exercises4.pdf

- 1 Formulate a sequence of OpenGL calls that sets the MODELVIEW matrix to represent a rotation of θ around the axis given by the two points $[1, 1, 4]$ and $[3, 4, 7]$. Also formulate a sequence of GLM matrix operations that achieves the same result.

2 Given a bounding box defined by

$$\mathbb{B} = \{[x, y, z] : -1 \leq x \leq 1 \quad -1 \leq y \leq 1 \quad -3 \leq x \leq -1\}$$

The MODELVIEW and PROJECTION matrices are identity matrices. Formulate a sequence of calls to glFrustum and other transformation functions s.t. the complete bounding box is inside the frustum. Also formulate a sequence of GLM matrix operations that achieves the same result.

3 Then, assume the bounding box are given by

$$\mathbb{B} = \{[x, y, z] : -1 \leq x \leq 1 \quad -1 \leq y \leq 1 \quad -1 \leq x \leq 1\}$$

The MODELVIEW and PROJECTION matrices are identity matrices. What is the simplest sequence of OpenGL calls s.t. the complete bounding box is inside the frustum? What is the sequence of GLM matrix operations that achieves the same result?

Exercises

Placeholder for robot arm exercise if I manage to finish preparing it in time.