Exercise 02561-04 **Input – mouse, keyboard, menus, windows, selection, pick**

Readings
Angel: chapter 3.4 – 3.11
Primer: chapter 3

Purpose
The purpose of the exercise is to get acquainted with input and window management in Glut and OpenGL. In particular we will work with mouse input, keyboard input, menus, multiple windows, logic operations, selection and picking,

Part 1
Run the demonstration program **newpaint**.
Understand how the program handles mouse and keyboard input as well as menus and submenus. What does the function pick actually do?

Part 2
Run the programs **select**, **pick**, **picksqua**, **pickdept** and understand selection and picking in OpenGL. What is the difference between selection and picking.

Part 3
Run the demonstration programs **line** and **single_double** and understand the principles of logic operations and rubber banding.

Part 4
Make a program, which can draw and edit simple circuit diagrams, such as the one shown in Appendix A.

The program should support capacitors, resistors, and transistors. A user should be able to insert new components and delete old components. In addition, it should be possible to move, rotate, and scale existing components.
Hint: Use the file 02561-04-04-2009.cpp from CampusNet as a template for this program.

Optional
Implement persistence. At startup the program should load a text file in which each line contains the information about a single component in the diagram.
A line could contain the following information:

```
comp-name  tx ty theta sx sy
```

where comp-name is component type, (tx,ty) is the translation, theta is the rotation, and (sx,sy) is the scale of the component. When the program is shut down, the current diagram should optionally be saved.

Part 5 (optional)
Extend the program so you can do more advanced editing of the diagram. This could include the ability to connect components with wires, zooming, etc.

Appendix A

02561-04 Circuit diagram