Otto-von-Guericke Universität Magdeburg

Arbeitsgruppe für Eingebettete Systeme und Betriebssysteme
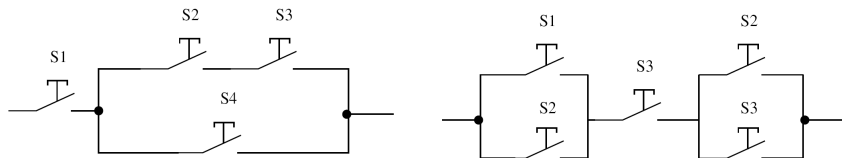Prof. Dr. Jörg Kaiser
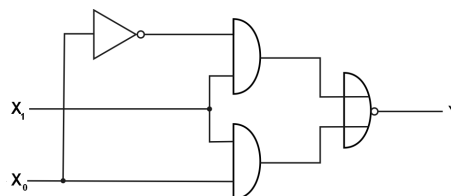
Theoretical Aufgabenblatt 1

Abgabetermin: 27.10.-29.10.2014

1. Define the terms machine language, assembly language and high level language. What are the major differences between them?

2. Deduce the truth tables for the different networks of switches. Switches that are labelled the same are switched together

   Deduce the boolean function out of the network of switches. Transfer the function to a logical network consisting of standard gates.

3. Which of the equations a) to c) describe the same function as the one of the following network of gates?

   a) $y = \overline{x_0 + x_1}$

   b) $y = \overline{x_1 \overline{x_0} + x_1 x_0}$

   c) $y = \overline{x_1}$

4. Simplify the following terms using the laws of the boolean algebra. Annotate the used laws!

   a) $\overline{w}x\overline{y}\,\overline{z} + \overline{w}x\overline{y}z + w\overline{x}y\overline{z} + wx\overline{y}\,\overline{z} + wx\overline{y}z$

   b) $xy + \overline{x}\overline{y}w$

   c) $\overline{x}\,\overline{y}\,\overline{z} + \overline{\overline{\overline{w}\,\overline{y}z}\,\overline{w\overline{y}z}}$

5. Extend the electrical diagram, so that the lamp behaves like a XOR-gate concerning the switches S_0 und S_1.

S_0

S_1