Digital electronics 1

The repository contains VHDL examples for bachelor course *Digital Electronics 1* at Brno University of Technology, Czechia. In folder Docs all manuals are stored. Folder Docs/Hw contains KiCad schematic of CPLD expansion board used in the course. All screenshots and images are located in Images folder and computer lab exercises are located in Labs folder.

Laboratory exercise	Description
01-gates	Lab 1: Introduction to digital circuits
02-ise	Lab 2: Introduction to VHDL and Xilinx ISE
03-segment	Lab 3: Hexadecimal digit to seven-segment decoder
04-adder	Lab 4: Binary adder
05-counter_binary	Lab 5: Binary counter
06-display_driver	Lab 6: Driver for seven-segment display
07-stopwatch	Lab 7: Stopwatch
08-traffic_lights	Lab 8: Traffic light controller
project	Lab 9-13: Project

Materials

The following hardware and software components are mainly used in the lab.

Hardware

- CoolRunner-II CPLD starter board: reference manual, schematic, XC2C256-TQ144, shop
- Platform Cable USB II, USB tool for in-circuit configuration and programming of all Xilinx devices: shop
- CPLD expansion board by Michal Kubicek: schematic

Software

- ISE Design, ISE WebPACK Design Software, ver 14.7: web page, installation
- Linux Mint 18.2 "Sonya" Xfce (64-bit): web page



Figure 1: CoolRunner-II CPLD starter board

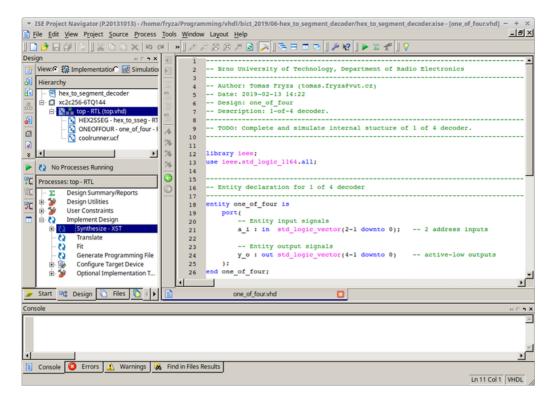


Figure 2: ISE Design, ISE WebPACK Design Software, ver 14.7

References

- 1. ES 4 VHDL reference sheet
- $2.\,$ Digital electronics 1 wiki
- 3. ASHENDEN, Peter J. *The designer's guide to VHDL*. 3rd ed. Boston: Morgan Kaufmann Publishers, c2008. ISBN 978-0-12-088785-9.
- 4. CHU, Pong P. FPGA prototyping by VHDL examples. Hoboken, N.J.: Wiley-Interscience, c2008. ISBN 978-0-470-18531-5.
- 5. KALLSTROM, P. A Fairly Small VHDL Guide. Version 2.1.
- 6. GitHub GIT CHEAT SHEET

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