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

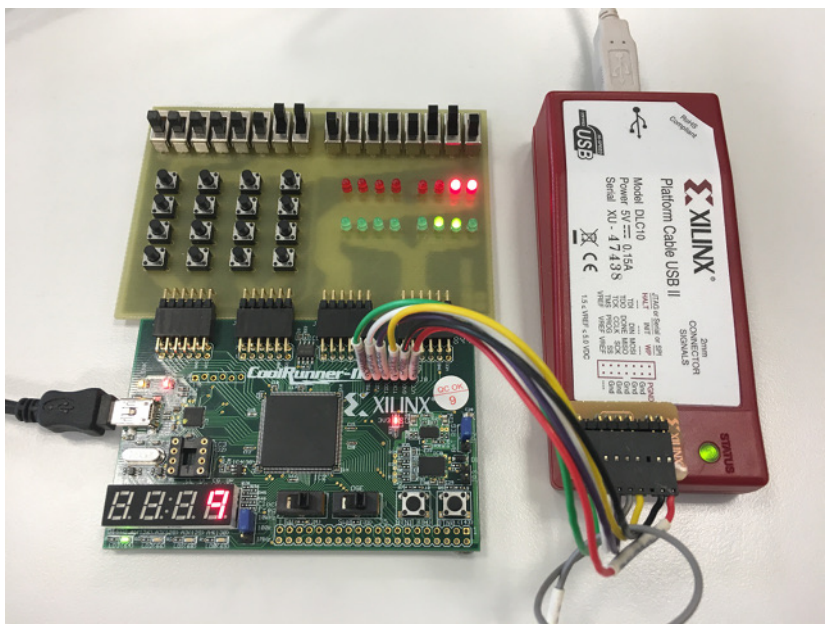

Figure 1: CoolRunner-II CPLD starter board

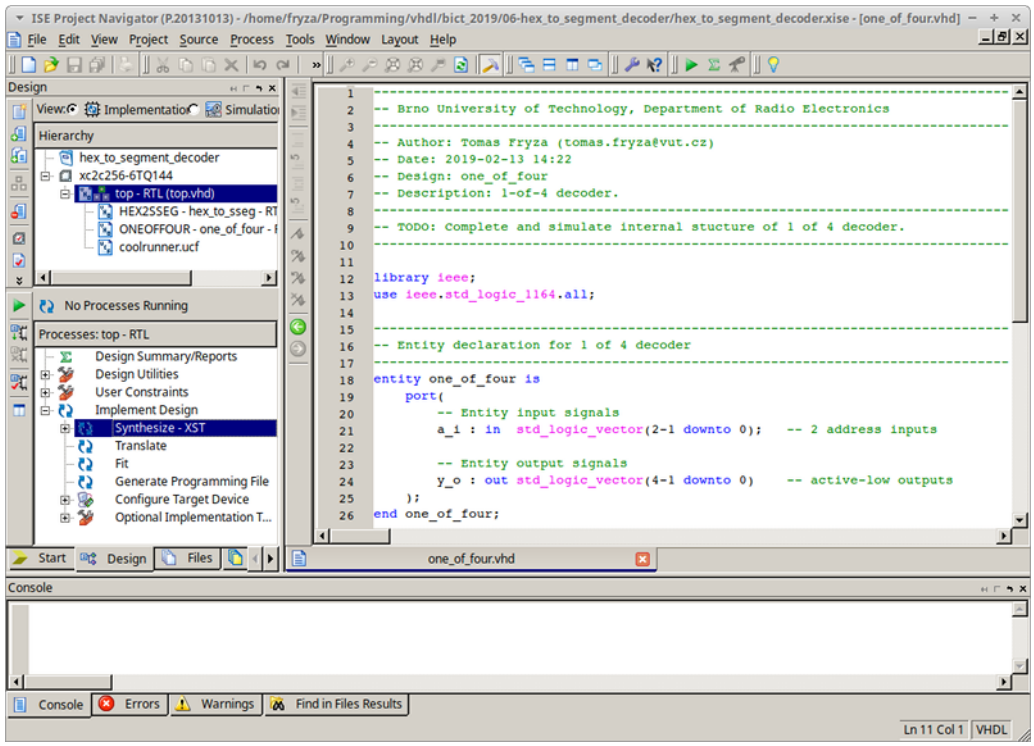

Figure 2: ISE Design, ISE WebPACK Design Software, ver 14.7

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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