COMP3211/COMP9211 Computer Architecture

Lab1 Xilinx Vivado

Before the lab starts, it is required that you install the Vivado simulation tool on your home computer. The software and the installation guide are available on the Resources page of the course website.

Goals

1. Learn simulation with Vivado;
2. Study how to build a hardware model and evaluate the hardware design with Vivado.

Tasks:

Task 1 (10 marks):

- Build a hardware model to rotate-left-shift a 16-bit value by a given number of bits. The shift amount is in a range of 5 bits.
- Simulate and verify your model;
- Synthesize the model to find its delay and area cost.

Task 2 (10 marks):

- Design and build a hardware model for majority voting, where 31 voters participate the voting.
- Simulate and verify your model;
- Synthesize the model to find its delay and area cost.

For the above two tasks, assume device xc7a100tfg256-3 (as used in the tutorial) is used.

Due: Your lab class in Week 2

- Lab presentation for **peer assessment**

Assessment scheme:

Your work will be assessment by your peer students and tutor. For the assessment

- Your TLB class is randomly divided into two assessement groups, each capped at 11 students. This is to allow sufficient time for the assessment.
- Each student is given 6 mins for presentation and 2 mins for Q&A.
    - The presentation covers three areas: design idea, HDL model, simulation results
- The work is assessed based on three categories:
    - Presentation (0-5)

        - clarity
        - logic
        - timing management
    - Completion (0-5)
    - Quality (0-5)
- The assessment form will is provided.
- Your tutor will organize and steer the lab.
- By the end of the lab class, all students are required to submit their assessment forms. Your participation to the assessment will be taken into account to the overall lab participation marks.