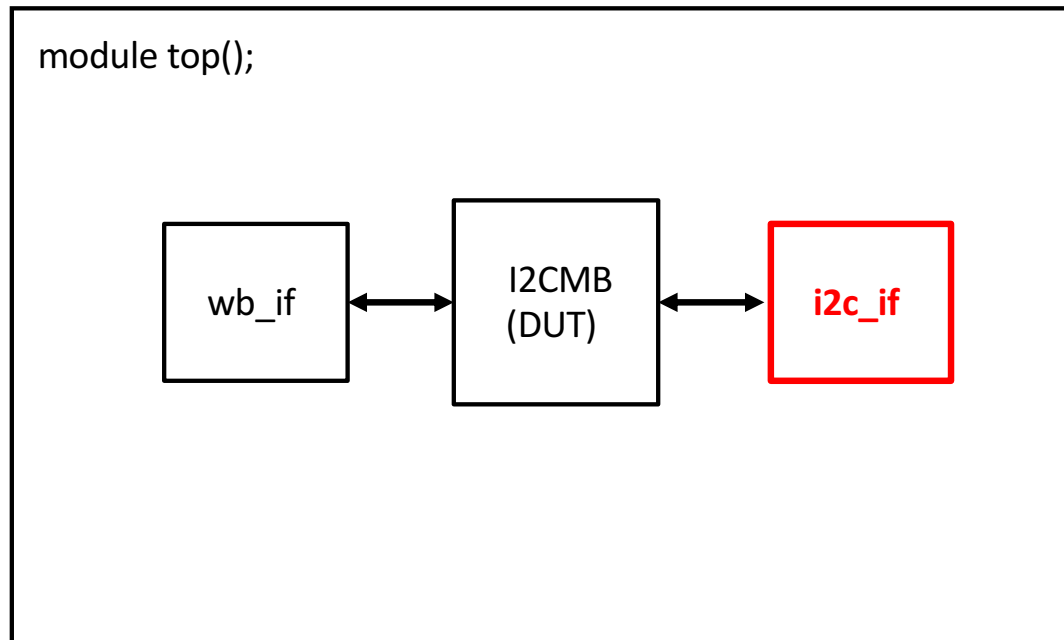


ECE 745

ASIC Verification

Project 1 Assignment – I2CMB Interface



Provided in Assignment

- Directory structure and files from Lab 1

Project Instructions - Setup

- In the project_benches directory:
 - Copy your lab_1 project directory to proj_1 directory
- In the verification_ip/interface_packages directory:
 - Make an i2c_pkg directory
 - Create a src directory under i2c_pkg
 - Create an i2c_if.sv file under the i2c_pkg/src directory
 - Create a Makefile under i2c_pkg that compiles the i2c_if.sv
 - Similar to Makefile under wb_pkg directory
- In the project_benches/proj_1 directory
 - Include the i2c_pkg/Makefile in the sim/Makefile
 - Add the compile target for i2c_if.sv to the sim/Makefile as a dependency to the comp_bench target
- Run 'make debug' to compile and run the bench
 - Simulation should run as in lab_1

Project Instructions – i2c_if Creation

- Study the I2C specification
- Implement the following tasks within the i2c_if interface that models an I2C Slave which
 - Waits for and captures transfer start
 - task wait_for_i2c_transfer (output i2c_op_t op, output bit [I2C_DATA_WIDTH-1:0] write_data []);
 - Provides data for read operation
 - task provide_read_data (input bit [I2C_DATA_WIDTH-1:0] read_data [], output bit transfer_complete);
 - Returns data observed
 - task monitor (output bit [I2C_ADDR_WIDTH-1:0] addr, output i2c_op_t op, output bit [I2C_DATA_WIDTH-1:0] data []);

Project Instructions – i2c_if Instantiation

- Place an instance of i2c_if within top.sv with an instance name of i2c_bus
- Connect i2c_bus to the DUT
- Create an initial block named monitor_i2c_bus within top.sv that
 - Calls i2c_bus.monitor task
 - Displays the observed values
 - I2C writes should start with the message: “I2C_BUS WRITE Transfer:”
 - I2C reads should start with the message: “I2C_BUS READ Transfer:”

Project Instructions – i2c_if Verification

- Write 32 incrementing values, from 0 to 31, to the i2c_bus
- Read 32 values from the i2c_bus
 - Return incrementing data from 100 to 131
- Alternate writes and reads for 64 transfers
 - Increment write data from 64 to 127
 - Decrement read data from 63 to 0
- Verify i2c_bus operation using messages in transcript from i2c_bus.monitor task
- Note:
 - All operations done through DUT via wb_bus
 - Project submission will be run by TA's to verify operation of these steps
 - Do not clutter up transcript with your debug messages

Clarity:
I2C source
Transcript

Project Submission

- Submit by 11:59pm on Friday, February 21st
 - Midnight Friday, 2/21
- Single tar file
 - Containing: ece745_projects directory and all sub-directories
 - Named: <unityld>_p1.tar
 - Execute 'make clean' in sim directory before creating tar file



