**Homework 1**

**From Chapter 1: Verification Guidelines**

The purpose of this homework is to:

1. Practice writing a test plan
2. Practice writing a test-bench
3. Become comfortable with the VCS verification tool

Create a test plan and self-checking test-bench for the ALU we went over in class. The ALU design is provided in the hw1 directory and has the following characteristics.

1. Reset which resets C to 0.
2. 4-bit signed inputs, A and B
3. 5-bit registered signed output C
4. 4 op-codes
   1. add
   2. sub
   3. bitwise invert input A
   4. reduction OR input B
5. Assume the following encoding of the opcodes.

|  |  |
| --- | --- |
| **Opcode** | **Encoding** |
| add | 2’b00 |
| sub | 2’b01 |
| bitwise invert input A | 2’b10 |
| reduction OR input B | 2’b11 |

You must use VCS and your testbench must be self checking. Cut and paste the transcript window into your HW submission.

Deliverables:

1. Test plan for ALU
2. Code for ALU testbench
3. Copy of transcript on terminal window after running VCS
4. Waveforms as observed using DVE.