

## Lab Software Installation Manual

### Logisim Evolution Installation:

Install version 3.8.0 using link: [Link](#)

Logisim-evolution is a Java application; therefore, it can run on any operating system supporting the Java runtime environment. It requires Java 16 (or newer). If JAVA is not installed, install using link: [Link](#)

### Verilog Installation:

To download and install Iverilog, Goto this site: [Link](#)

Follow this YouTube tutorial: [Link](#)

Make sure to click “Add Icarus Verilog executables folder to the system PATH”

For Linux installation,

```
sudo apt-get update
sudo apt-get install iverilog
sudo apt-get install gtkwave
```

### VSCoDe (IDE to write Verilog code):

My suggestion is VSCode. Goto to this link to download: [Link](#)

Follow this YouTube tutorial: [Link](#)

Make sure to install the Verilog addon for syntax highlighting.

### Simulation of Verilog program with test bench:

Go to terminal in VSCode and write:

```
iverilog -o out.vvp comparator.v stimulus.v
# comment: out.vvp is the name output file after
# compilation. "-o" defines output parameter.
vvp out.vvp
# comment: Show the output of the stimulus
```

### Graphical simulation/waveforms of Verilog program with test bench:

Go to terminal in VSCode and write:

```
gtkwave test.vcd &
# It will show graphical simulation.
```

**Slides link for Lab 1 Class:**

- **Introduction 3 - VLSI & FPGA v2.pdf**
- **Introduction 2 - Analog Electronics II (CMOS) v2.pdf**
- **ALU 1 - Adder & Subtractor v2.pdf**
- **HDL 1 - Combinational Circuit.pdf**
- **HDL 2 - Sequential Circuit.pdf**