

Writing Lab Reports for CSE369

Why Lab Reports?

Effective technical communication is a particularly critical skill once you graduate. Technical communication can take the form of writing research grants and papers, writing documentation for your work, or making presentations to your collaborators, managers, clients, or venture capitalists.

CSE369 is primarily a lab-based course and we employ two forms of technical communication: **lab demos** and **lab reports**. Lab demos allow you to practice *verbal* communication and lab reports allow you to practice *written* communication.

The lab reports, in particular, serve a few roles:

- 1) Communicate to us that you learned and/or achieved what we wanted you to in the lab,
- 2) Prepare you for your lab demo and help keep the lab demos short, and
- 3) Create a persistent digital artifact that you can refer back to in the future.



This last point is of particular importance should you ever need to look back on your work from this course as it pertains to your future academic, professional, or personal projects!

However, we recognize that this course is not focused on technical communication. So, while this is an extremely valuable skill to work on, we are asking for close to *the bare minimum* of technical communication in this class.

Lab Report Requirements

- Lab reports must be submitted as a *single* PDF file.
 - You can print directly to PDF from Office products (like Microsoft Word).
 - You can combine multiple PDF files into one using Adobe Acrobat or online websites.
- Your lab report should begin with your **name**, your **student ID number**, and the **lab number** (optionally, include the lab name).
- All requested report items will be listed in each lab spec and should be presented *in the order asked*.
 - You are free to include as much white space between items as necessary to keep your report neat and clear (digital pages are free!).
- **All requested report items should be comprehensible, properly labeled, and explained, as appropriate (see the Examples section).**
- Your lab report should end with your estimated total time to complete the lab.
- SystemVerilog HDL files should be submitted separately and do not need to be included in your lab reports.

Examples

The following are some basic examples of sufficiently labeled and explained responses to different lab prompt types. Feel free to use whatever formatting and layout you prefer, but just remember that the goal is to produce a document that allows you to easily remember what you did (and why) years down the road without having to re-read the entire lab spec thoroughly.

- Anything **generated by hand** can be included by scanning or importing a photo.
- Anything **generated electronically** can be imported or included via screenshot.

Simple Question

These often don't require any special labeling or explanation, though it should be clear what question you are answering.

Example Prompt:

- The position of the switches (up or down) that cause them to output TRUE.

Example Response:

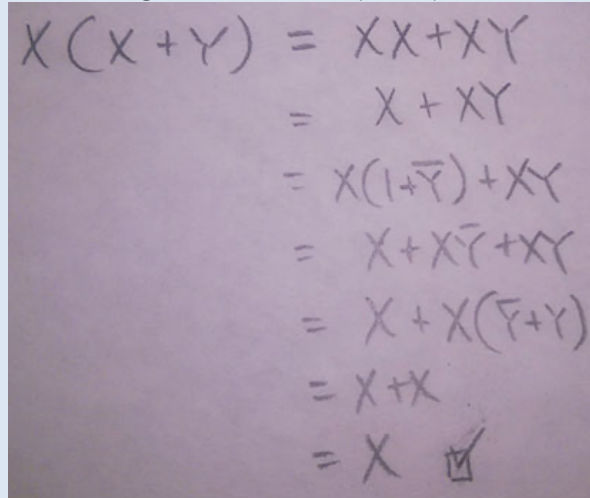
The switches on the DE1 board output TRUE when they are in the **MIDDLE** position.

Showing Your Work

Label your work with what you are trying to calculate/prove.

Example Response:

Boolean Algebra Proof for $X(X + Y) = X$:



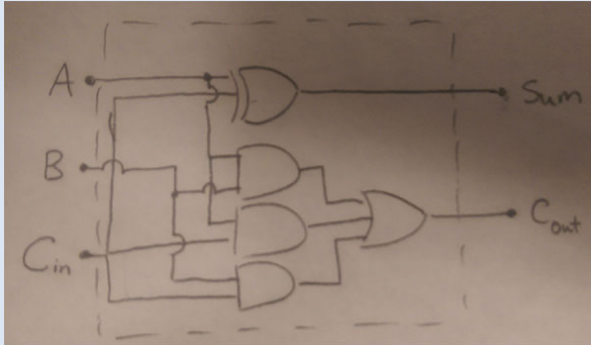
A photograph of a handwritten proof on a piece of paper. The proof shows the following steps:

$$\begin{aligned} X(X + Y) &= XX + XY \\ &= X + XY \\ &= X(1 + \bar{Y}) + XY \\ &= X + X\bar{Y} + XY \\ &= X + X(\bar{Y} + Y) \\ &= X + X \\ &= X \quad \checkmark \end{aligned}$$

Diagram

Diagrams typically consist of a circuit diagram, block diagram, or finite state machine. You are welcome to generate these by hand or electronically (*e.g.*, inserting shapes in Office). When drawn out by hand, you can include them by either scanning or importing a photo of it. **Make sure to label what this is a diagram of and include a brief explanation of what the circuit/system/FSM does.**

Full Adder Circuit Diagram:

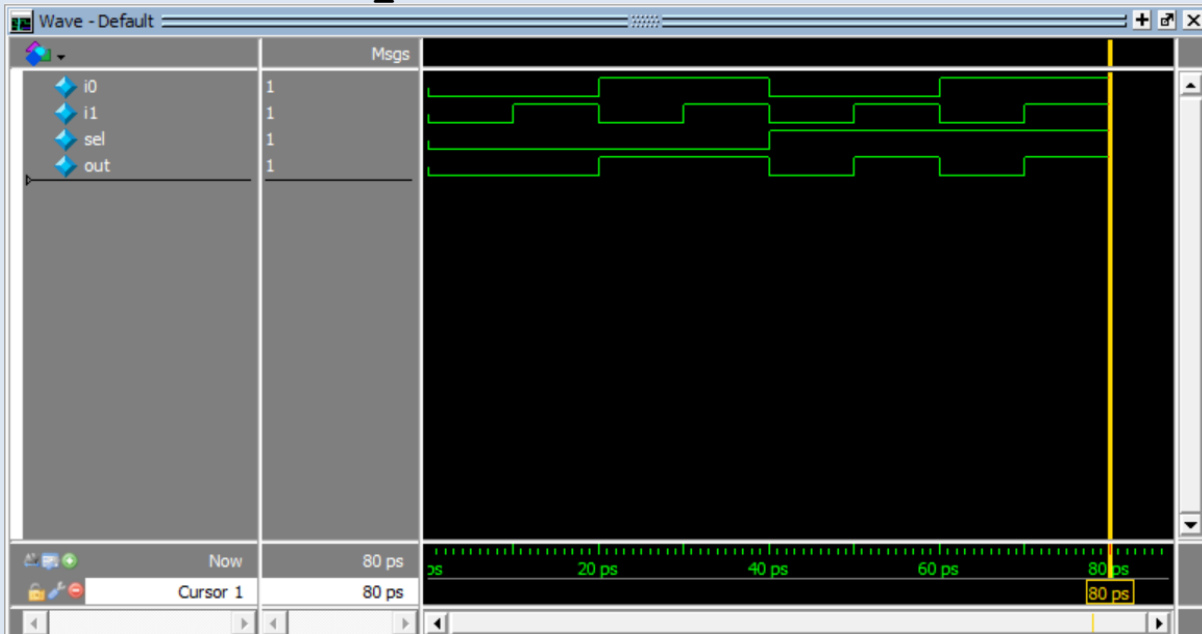


This circuit takes sums two inputs bits and a carry-in bit and outputs the sum and carry-out bit.

Screenshot

Typically, this will be for simulation results or resource utilization in ModelSim. Make sure that the points of interest are visible! If necessary, you can zoom in and include multiple screenshots to get your point across. **Make sure to label the screenshot and include a brief explanation of what it shows/proves.**

ModelSim Simulation of mux2_1:



This simulation runs through all 8 possible input combinations (i_0 , i_1 , sel) of mux2_1, changing every 10 ps and showing that the output (out) matches the selected input bit (i_0 if $sel==0$ and i_1 if $sel==1$).