

CS 352 Homework

Gates

1 Overview

Your task in this homework is to learn about the construction of fundamental logic gates out of which computers are built. You will do this using a hardware description language (HDL) designed by the authors of your textbook.

2 Requirements

1. Complete all the gates of chapter 1: `Not`, `And`, `Or`, `Xor`, `Mux`, `DMux`, `Not16`, `And16`, `Or16`, `Or8Way`, `Mux16`, `Mux4Way16`, `Mux8Way16`, `DMux4Way`, and `DMux8Way`.
2. Design a gate named `Or3` that accepts three pins: `a`, `b`, `c`. When any of these is 1, `out` is 1. Otherwise, `out` is 0. Write your solution in `Or3.hdl`.
3. Design a gate named `Majority` that accepts three pins: `a`, `b`, `c`. When at least 2 of these is 1, `out` is 1. Otherwise, `out` is 0. Write your solution in `Majority.hdl`. Use no more than four parts in your design. Construct a Karnaugh map to minimize your logic.

3 Later-week Submission

To qualify for later-week submission, you must complete the first 10 gates (from `Not` to `Or8Way`) specified in step 1 of the requirements and also `Or3` and `Majority`.

4 Submission

To submit your work for grading:

1. Run the grading script from your homework directory using `../specs/grade`.
2. Commit and push your work to your repository.
3. Verify that your solution is on Bitbucket by viewing your repository in a web browser.

A passing grading script does not guarantee you credit. Your grade is conditioned on a few things:

- You must meet the requirements described above. The grading script checks some of them, but not all.
- You must successfully submit your code to your repository. Expect to have issues with Git.
- You must not plagiarize. Write your own code. Talk about code with your classmates. Ask questions of your instructor or TA. Do not look at others' code. Do not ask questions specific to your homework anywhere online but Piazza. Your instructor employs a vast repertoire of tools to sniff out academic dishonesty, including: drones, moles, and a piece of software called

MOSS that rigorously compares your code to every other submission. You don't want to live in a world serviced by those who squeaked by through questionable means. For your future self, career, and family, do your own work.

The grading script allows you to signal your instructor when requirements are met. You only need to send an email if you qualified for later week submission and are resubmitting after the original deadline.