

# CSCI 2321 (Computer Design), Spring 2021

## Homework 5

**Credit:** 15 points.

### 1 Reading

Be sure you have read, or at least skimmed, all assigned sections of Appendix B.

### 2 Problems

Answer the following questions. You may write out your answers by hand and scan them, or you may use a word processor or other program, but please submit a PDF or plain text via e-mail to my TMail address. (No links to shared files on Google Drive please.) Please use a subject line that mentions the course and the assignment (e.g., “csci 2321 hw 5” or “computer design hw 5”).

1. (7.5 points) Construct the truth table for a four-input odd-parity function (i.e., a function that returns 1 if an odd number of the input bits are 1, 0 otherwise). *Note* that the parity functions (odd or even) described in Appendix B (starting on p. B-65) are the same idea as “parity bits” as described in many online sources (the Wikipedia article, for example) *but not exactly the same* — a parity function tells you whether the input already has whatever parity it is, while a parity bit is whatever is needed to produce the desired parity.
2. (7.5 points) Implement your four-input odd-parity function using AND and OR gates and bubbled inputs/outputs.

*Hint:* You could do worse than what I describe in lecture as the “simple dumb way”. “Obviously right” has much to recommend it in context, though in other contexts it might be worthwhile to aim instead for “smallest number of gates”.

### 3 Pledge

For programming assignments, this section should go in the body of the e-mail or in a plain-text file `pledge.txt` (no word-processor files please). For written assignments, please put it in the text or PDF file with your answers.

Include the Honor Code pledge or just the word “pledged”, *plus* at least one of the following about collaboration and help (as many as apply). Text *in italics* is explanatory or something for you to fill in.

- I did not get outside help *aside from course materials, including starter code, readings, sample programs, the instructor.*
- I worked with *names of other students* on this assignment.
- I got help with this assignment from *source of help — ACM tutoring, another student in the course, etc. (Here, “help” means significant help, beyond a little assistance with tools or compiler errors.)*

- I got help from *outside source* — a book other than the textbook (give title and author), a Web site (give its URL), etc.. (Here too, you only need to mention significant help — you don't need to tell me that you looked up an error message on the Web, but if you found an algorithm or a code sketch, tell me about that.)
- I provided help to *names of students* on this assignment. (And here too, you only need to tell me about significant help.)

## 4 Essay

For programming assignments, this section should go in the body of the e-mail or in a plain-text file `pledge.txt` (no word-processor files please). For written assignments, please put it in the text or PDF file with your answers.

Include a brief essay (a sentence or two is fine, though you can write as much as you like) telling me what if anything you think you learned from the assignment, and what if anything you found interesting, difficult, or otherwise noteworthy.