University of Washington – College of Engineering

Spring 2023 Instructor: Justin Hsia 2023-05-04

EE/CSE371 QUIZ 3

Name: _____

Student ID Number: _____

Please do not turn the page until 11:50.

Instructions

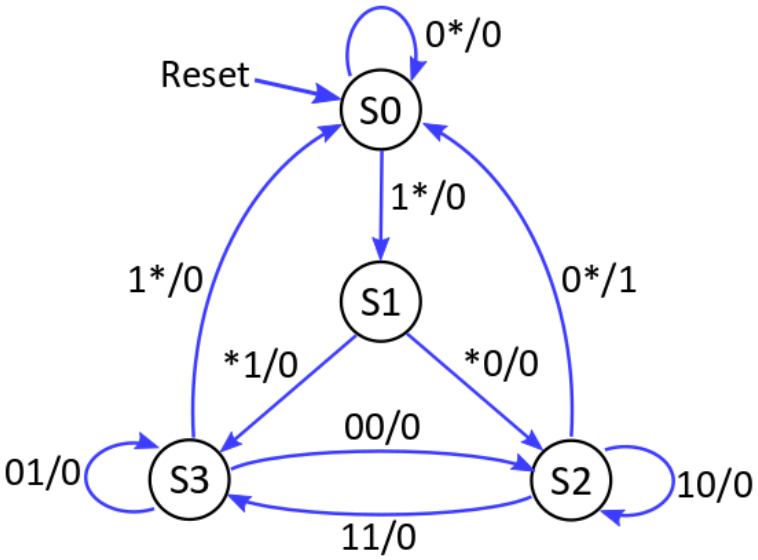
- This quiz contains 3 pages, including this cover page. You may use the backs of the pages for scratch work.
- Please clearly indicate (box, circle) your final answer.
- The quiz is closed book and closed notes.
- Please silence and put away all cell phones and other mobile or noise-making devices.
- Remove all headphones and watches.
- You have 30 (+5) minutes to complete this quiz.

Advice

- Read questions carefully before starting. Read *all* questions first and start where you feel the most confident to maximize the use of your time.
- There may be partial credit for incomplete answers; please show your work.
- Relax.

ASM Chart

The state diagram below has inputs x and y (in that order) and an output z. * means don't care/any. Draw the equivalent ASM chart. [10 pts]



ASMD Chart

The following *incomplete* ASMD chart is for a sequential circuit that **computes the sum of n consecutive addresses from a ROM** that is part of its datapath, for a fixed/known value of `n`.

- The system inputs are: `reset`, `start` (starts the computation), and `addr` (starting index of ROM). You should ensure that the user cannot interfere with the computation once it has started.
- The system outputs are: `ready` (while idling) and `done_tick` (high for one cycle when computation is complete).

Complete the chart by adding any necessary **boxes**, **blocks**, **control signals**, and **RTL operations** (*i.e.*, no extra states). Please choose reasonable names for control signals and data registers. [14 pts]

- You may use the syntax `ROM[i]` to indicate the data stored in the ROM at address `i`.