University of Washington – College of Engineering

Spring 2026 Instructor: Justin Hsia 2026-05-07

EE/CSE 371 QUIZ 3

Name: _____

Student ID Number: _____

Please do not turn the page until 11:50.

Instructions

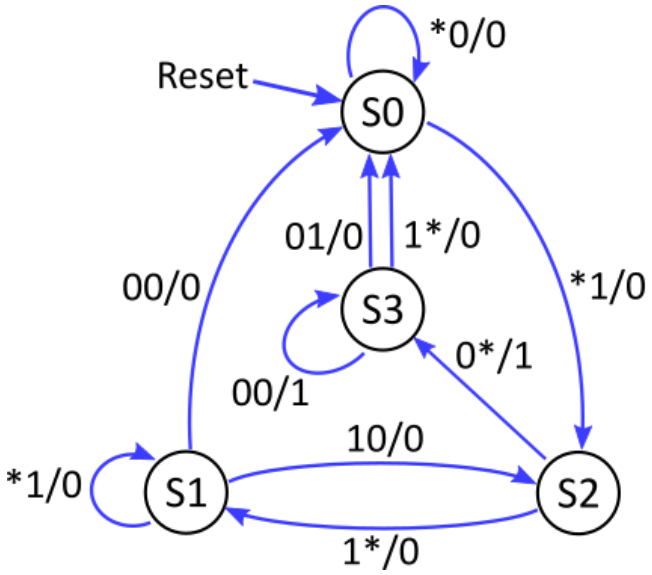
- This quiz contains 3 pages, including this cover page. You may use the backs of the pages for scratch work.
- Please clearly indicate (box, circle) your final answer.
- The quiz is closed book and closed notes.
- Please silence and put away all cell phones and other mobile or noise-making devices.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

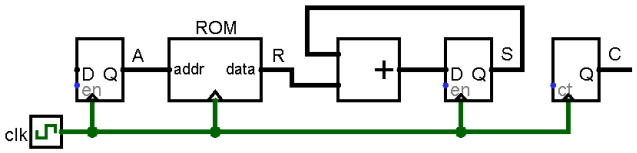
The state diagram below has inputs x and y (in that order) and an output z. * means don't care/any. Draw the equivalent ASM chart. [10 pts]



ASMD Chart

The following *incomplete* ASMD chart is for a sequential circuit that **computes the sum of n consecutive addresses from a ROM whose *output is registered***, for a fixed/known value of `n≥1`.

- External inputs: **`reset`**, **`start`** (starts the computation), and **`addr`** (starting index of the ROM). There is no need for a `start` de-assertion loop.
- Status indicators: **`ready`** (while idling) and **`done`** (provided for you).
- Datapath: **A** and **S** are enabled registers. **C** is a counter. The ROM has a clock input because its output is registered (*i.e.*, there is an internal register). Use **R** for the ROM output instead of `ROM[i]`.



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. You must use the data register names found in the datapath above. [15 pts]

- The unlabeled states should have the names **`S_sum`** and **`S_wait`**, but you will need to decide which is which.