Lab 3: Moore and Mealy Machines

CSCI 340: Computational Models

100 points

Submission will be through `autolab.millersville.edu`

Remember to use JFLAP (version 7.1) to complete these problems.

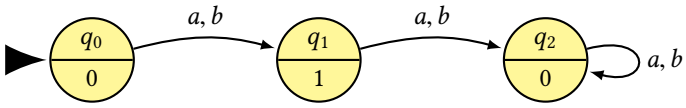
Steps to Follow

- Go to AutoLab and download the handout for Lab 3. This will give you a `.zip` file with six `.jff` files in it. The structure of the `.zip` file should be:

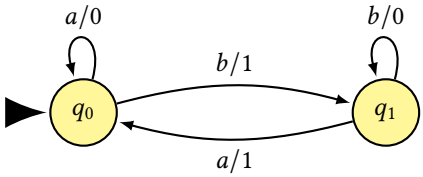
  ```
  $ zip -sf handout.zip
  Archive contains:
    handout/
    handout/1.jflap.jff
    handout/2.jflap.jff
    handout/3.jflap.jff
    handout/4.jflap.jff
    handout/5.jflap.jff
    handout/6.jflap.jff
    handout/README.txt
  ```

- **Do NOT change the file names.** Edit the files in JFLAP to create the appropriate automata.
- When you are ready to submit one or more automata for testing, create a `.zip` file of the directory (**it must still be called handout**). This should ***exactly match*** the structure of the handout `.zip` file.
- Submit the created `.zip` file to AutoLab.

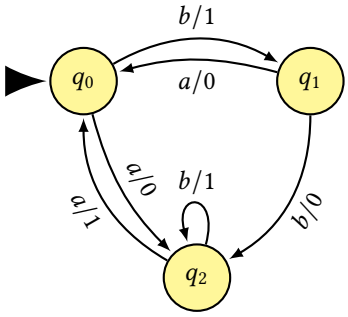
1. *(10pts)* Convert the following Moore machine to a Mealy machine:



2. *(10pts)* Convert the following Mealy machine to a Moore machine.
Make sure your leading character is a 0.



3. *(15pts)* Convert the following Mealy machine to a Moore machine.
Make sure your leading character is a 0.



4. *(20pts)* Design a Moore machine to perform a parity check on the input string. The output of the string ends in 1 if the total number of 1-bits in the input is odd and 0 if the total number of 1-bits is even. $\Sigma = \Gamma = \{0\ \ 1\}$.

5. *(20pts)* Moore and Mealy machines are often used in *circuit modeling*. One of the components of a circuit might be a delay – which remembers input and echoes it later. Delays are measured in units that represent clock cycles. Design a Mealy machine that represents a **one-unit delay**. Assume the first output is always a 0. $\Sigma = \Gamma = \{0\ \ 1\}$

Input	**Output**
`1001`	`0100`
`1100100`	`0110010`

6. *(25pts)* Design a Mealy machine that represents a **two-unit delay**. Assume the first two output characters are always 0. $\Sigma = \Gamma = \{0\ \ 1\}$

Input	**Output**
`1001`	`0010`
`1100100`	`0011001`