**CISS362: Introduction to Automata Theory, Languages, and
Computation
Assignment a04**

In general, if a solution is provided in Sipser, you should try it first and then check against they solution. If I provide a solution, do the same before looking at my solution.

An example of how to draw state diagrams using LaTeX is given below. Also, study the solution and the LaTeX code to 1.3 below.

- Sipser 1.1: The solution is in the Sipser book.
- Sipser 1.2: The solution is in the Sipser book.
- Sipser 1.3: The solution is provided below.
- Sipser 1.4: Q1. You solve Sipser 1.4 except for (b) and (d). Enter your answer in `q01.tex`. Solution to 1.4(b), 1.4(d) can be found in Sipser.
- Sipser 1.5: Q2. You solve Sipser 1.5 except for (a) and (b). Enter your answer in `q02.tex`. Solution to 1.5(a), 1.5(b) can be found in Sipser.
    a) In 1.5(d), a^*b^* is a shorthand for $\{a\}^*\{b\}^*$.
    b) In 1.5(e), $(ab^+)^*$ is a shorthand for $(\{a\}\{b\}^+)^*$ where $\{b\}^+ = \{b^n \mid n \geq 1\}$
    c) In 1.5(f), $a^* \cup b^*$ is a shorthand for $\{a\}^* \cup \{b\}^*$.
- Sipser 1.6: DIY.
- Sipser 1.7: Q3. You solve Sipser 1.7 except for (a) and (f). Enter your answer in `q03.tex`. Solution to 1.7(a), 1.7(f) can be found in Sipser.

How to draw a state diagram

Here's an example showing you how to draw the elements of a state diagram. Also, look at the solution to 1.3 below.
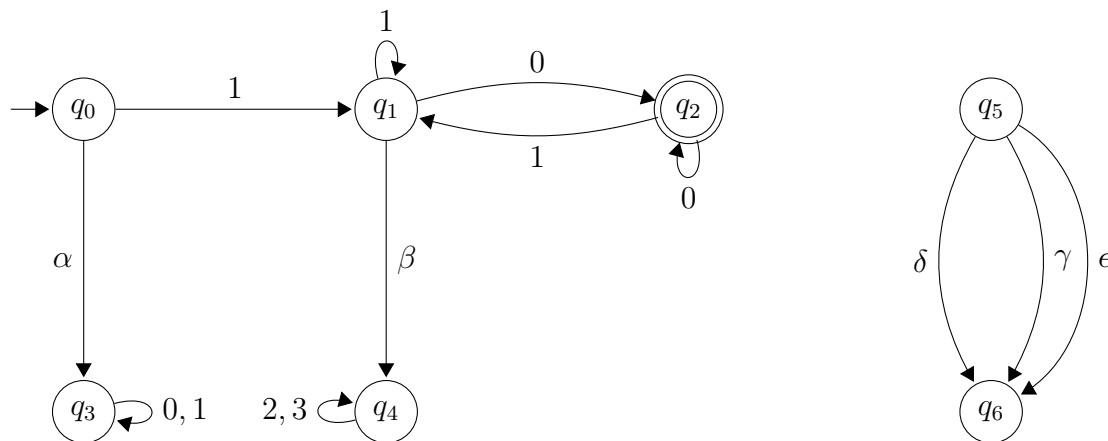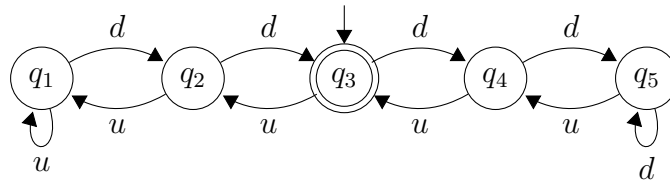

For more information on drawing state diagrams go to my website, scroll down to the Tutorials section and look for `latex-automata.pdf`.

Let me know if you have any questions about drawing state diagram.
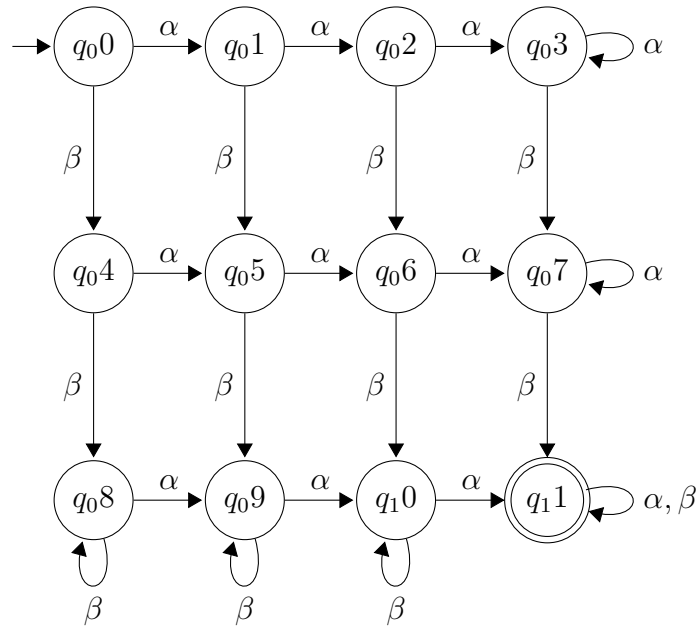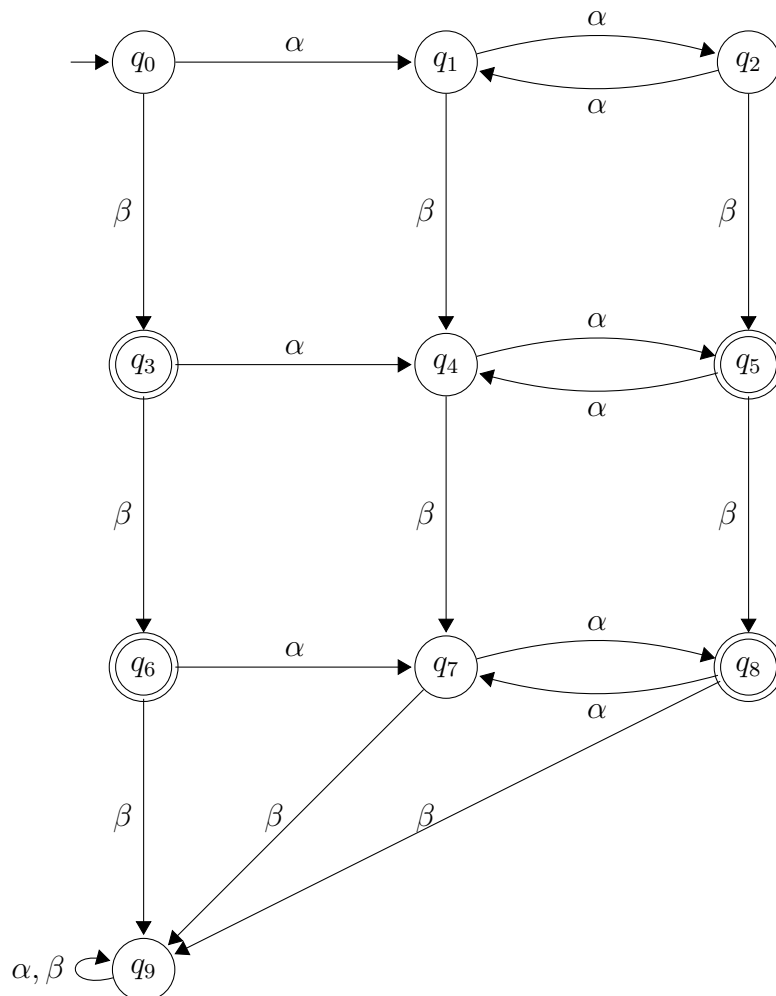
Solution to Sipser 1.3.

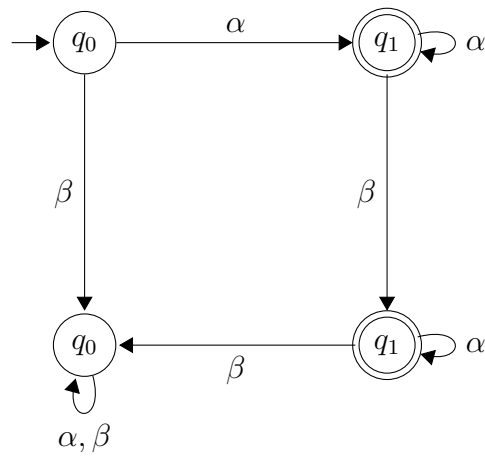Solution.

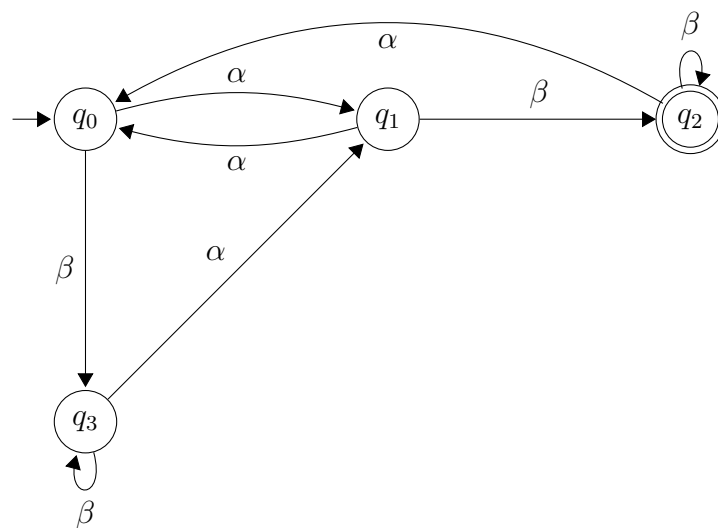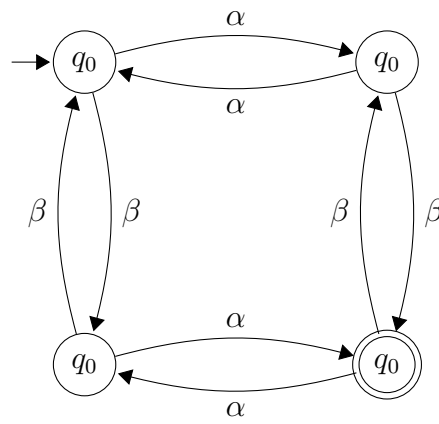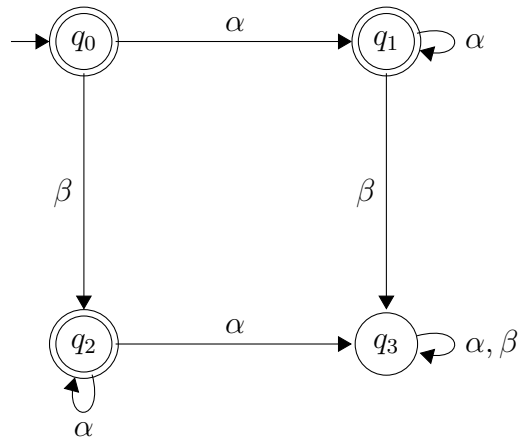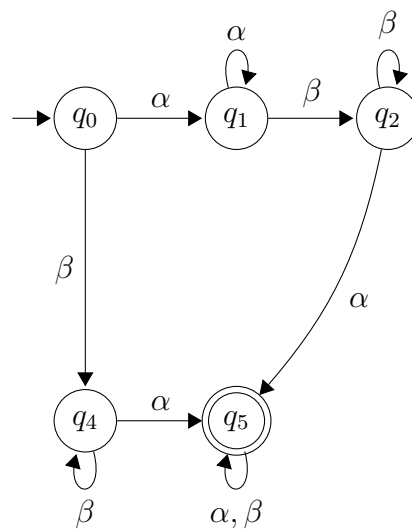Q1. Sipser 1.4 except for (b) and (d).

Solution.

(a)

(c)

(e)

(f)

(g)

Q2. Sipser 1.5 except for (a) and (b).

Solution.
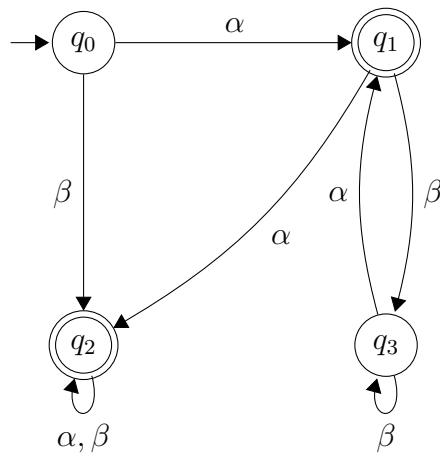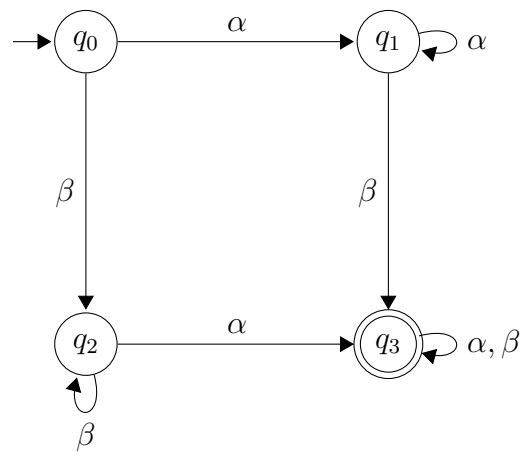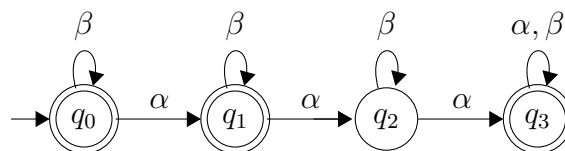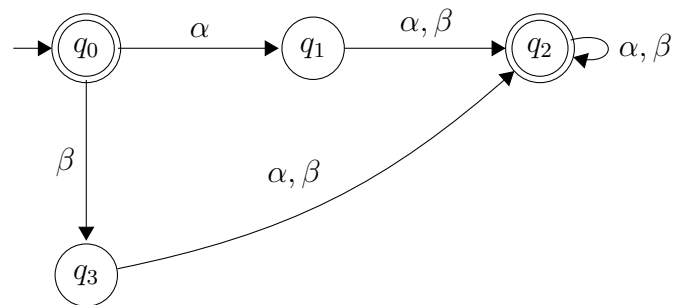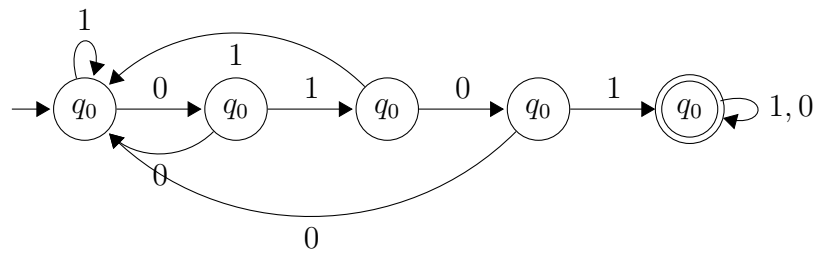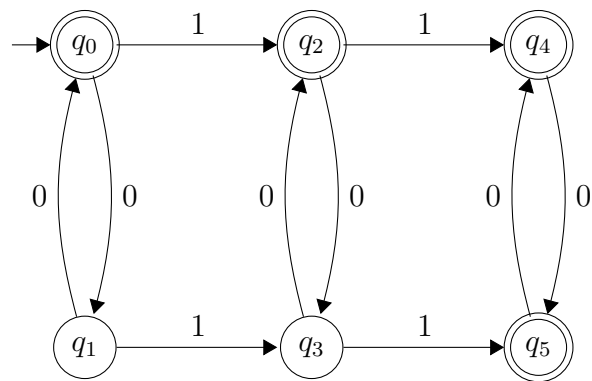
(c)

(d)

(e)

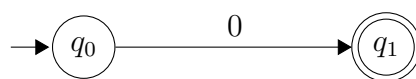
(f)
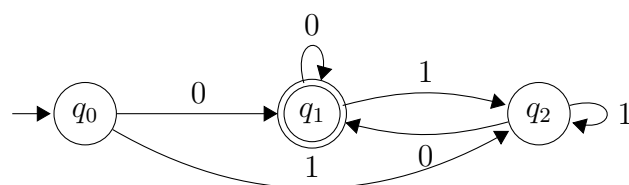

(g)

(h)

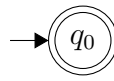Q3. Sipser 1.7 except for (a) and (f).

Solution.

(b)

(c)

(d)

(e)

(g)

$$\rightarrow \boxed{q_0}$$

(h)

$$\rightarrow \boxed{q_0} \circlearrowright 0$$