

**Homework 1**  
**Due: 8:00am Monday Feb 4 in Gradescope**

1. Figures 1.2 and 1.3 give the design of a automatic door controller. This door is a swinging door. Give the design (state transition diagram and state transition table) for a sliding automatic door (that slides into and out of the wall). Explain your assumptions you use in your design.
2. Exercise 1.4e
3. Exercise 1.4g
4. Exercise 1.5c
5. Exercise 1.6e
6. Exercise 1.6n
7. For any NFM  $M_1$ , prove that you can construct an NFM  $M_2$  that accepts the same language, but that has a single accept state. You need to prove this formally.