

Lecture #3: DFA Design and Verification

Part One

Questions for Review

1. When you are asked to “design a deterministic finite automaton,” what information are you given? What do you want to achieve?
2. What “very important question” about the deterministic finite automaton must be answered, if you are going to successfully design it?
3. If the language of the desired DFA is a language over the alphabet Σ then you should be able to identify a collection of subsets of Σ^* when this question is answered.
 - (a) How will these subsets be related to the answer for the “very important question” about the DFA that is considered above?
 - (b) How will these subsets be related to the states in your DFA?
4. Remaining steps in the process are supposed to help you to make sure that your answer to the above “very important question” makes sense and help you to use to complete the design of a deterministic finite automaton.

What is the first property of these subsets (possibly called a **sanity check**) that you should verify? Why is it important?
5. What is the second property of these subsets (or **sanity check**) that should be verified? Explain how (or why) this allows you to identify the **start state** of the DFA that is being designed.
6. What is the third property of these subsets (or **sanity check**) that should be verified? Explain how (or why) this allows you to identify the set of **accepting states** of the DFA that is being designed.
7. What is the fourth property of these subsets (or **sanity check**) that should be verified? Explain how (or why) this allows you to define the **transition function** for the DFA that is being designed, and to complete it.