

Week 2 Tutorial Session

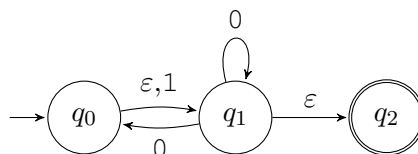
Tutorial exercises include more problems than what a typical student can solve in 20–25 minutes. Don't be discouraged if you cannot solve all the problems within the time limit.

1. Draw a state diagram of a DFA (over $\{a, b\}$) that accepts the following language:

- (a) $\{w \mid w \text{ contains the substring } baa\}$
- (b) $\{w \mid w \text{ has at least two } a\text{'s or at least two } b\text{'s}\}$
- (c) $\{w \mid w \text{ contains the same number of occurrences of } ab \text{ and } ba \text{ as substrings}\}$

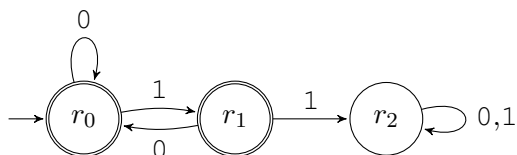
For example aba is in this language because aba contains a single ab and a single ba , but $abab$ is not in this language because $abab$ contains two ab and one ba .

2. (a) We considered the following NFA in the second lecture:



Does the NFA accept 01 ? 11 ? 011 ?

(b) Consider the following DFA:



What strings stop at r_0 ? At r_1 ? At r_2 ? What is the language of the DFA?