CPSC-406 Report

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Abstract

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3.1 Week 1

HW1 – DFA Exercises

Exercise 1 We are given two DFAs A_1 and A_2.

Accepted Words Table

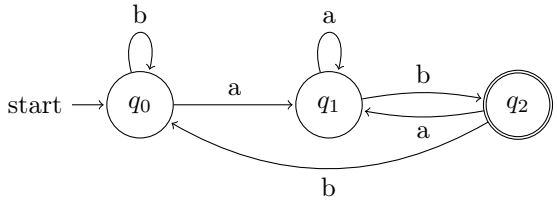
w	Accepted by A_1?	Accepted by A_2?
aaa	No	Yes
aab	Yes	No
aba	No	No
abb	No	No
baa	No	Yes
bab	No	No
bba	No	No
bbb	No	No

Language Descriptions

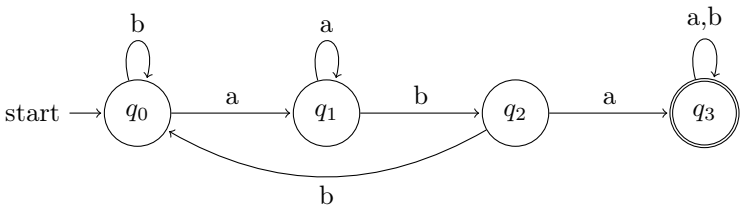
- $L(A_1)$: all strings over $\{a, b\}$ that start with a and end with an odd number of b's.
- $L(A_2)$: all strings over $\{a, b\}$ that end with at least two consecutive a's.

Exercise 2 – Designing DFAs

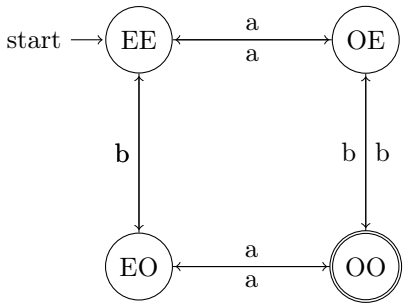
1. Words that end with ab



2. Words that contain aba

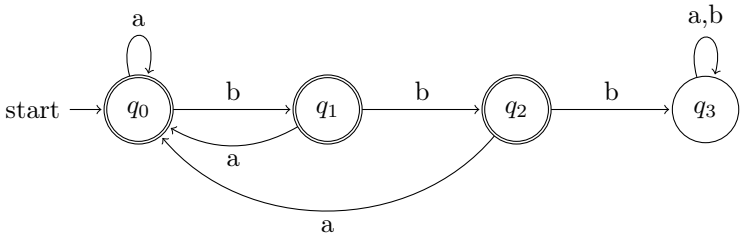


3. Odd number of a's and odd number of b's States represent parity: (a-parity, b-parity).

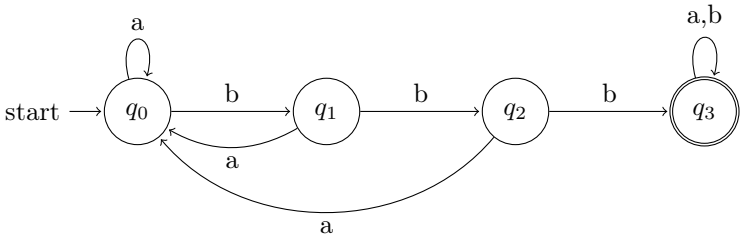


4. Even number of a's and odd number of b's Same automaton as above, but accepting state is EO.

5. Any three consecutive characters contain at least one a Equivalent to forbidding substring bbb.



6. Words that contain bbb



Observation

- Problems 3 and 4 use the same parity structure; only the accepting state changes.
- Problems 5 and 6 use the same "count consecutive b's" structure; one treats reaching three b's as rejection, the other as acceptance.
- Problems 1 and 2 track progress toward matching a pattern.

4 Synthesis

5 Evidence of Participation

6 Conclusion

References

[BLA] Author, Title, Publisher, Year.