CPSC-406 Report

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Abstract

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1 Introduction

2 Week by Week

2.1 Week 1

2.1.1 DFAs

Exercise 1

1. Which of the following words are accepted/refused by $\mathcal{A}_1$ and $\mathcal{A}_2$? Complete the table.

w	**accepted by $\mathcal{A}_1$?**	**accepted by $\mathcal{A}_2$?**
aaa	$\times$	✓
aab	✓	$\times$
aba	$\times$	$\times$
abb	$\times$	$\times$
baa	$\times$	✓
bab	$\times$	$\times$
bba	$\times$	$\times$
bbb	$\times$	$\times$

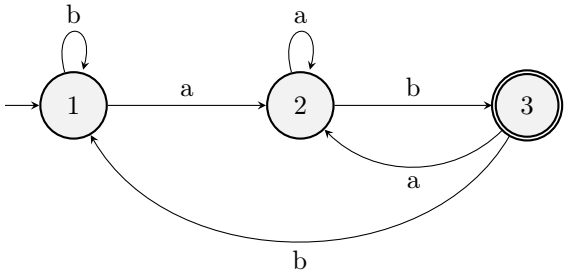
2. More generally, can you completely describe the languages $L(\mathcal{A}_k)$ accepted by $\mathcal{A}_k$, for $k = 1, 2$?

- $L(\mathcal{A}_1)$: The language of all words over $\{a, b\}$ that **start with the letter** a and **end with an odd number of consecutive** b**'s**.
- $L(\mathcal{A}_2)$: The language of all words over $\{a, b\}$ that **end with the substring** aa.

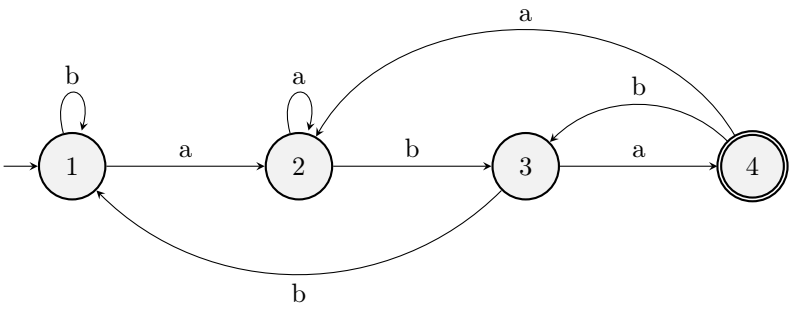
Exercise 2

Design DFAs whose accepted languages are given as follows:

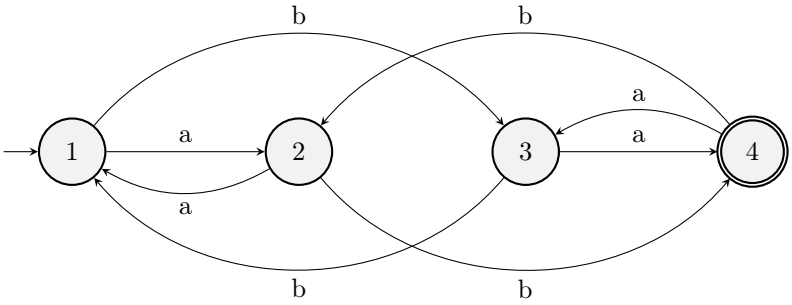
1. All the words that end with ab



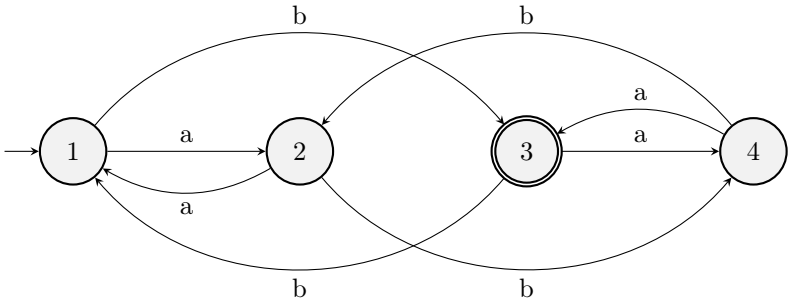
2. All the words that contain aba



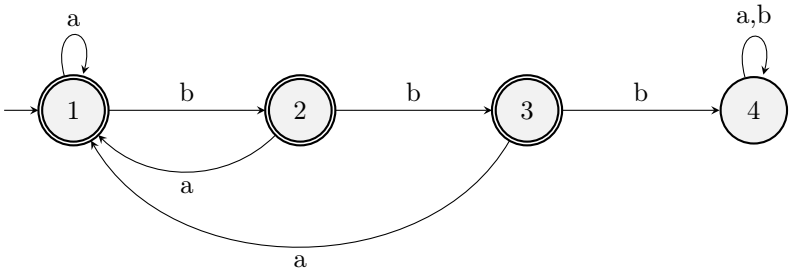
3. All the words that contain an odd number of a's and an odd number of b's



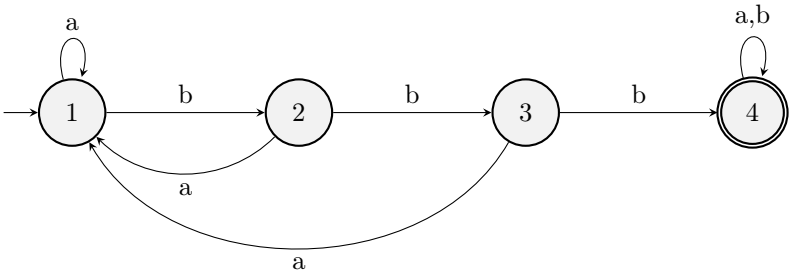
4. All the words that contain an even number of a's and an odd number of b's



5. All the words such that any three consecutive characters contain at least one a



6. All the words that contain bbb



What do you notice when comparing the various automata?

For DFAs that have criteria of "ends with," arrows must leave the accept state because the string could keep going and fail to satisfy DFA characteristics. For DFAs that have criteria of , "contains," the accept state must be a "Trap State" with a self-loop, because once you find the sequence, you can traverse through the DFA while satisfying DFA's accepted language conditions.

2.2 Question

What is the easiest and best way to implement DFAs in programming?

3 Synthesis

4 Evidence of Participation

5 Conclusion

References

[BLA] Author, Title, Publisher, Year.