1

Describe informally the languages accepted by the following `FAS`:

    b.

    c.

2

Construct an FA accepting each of the following languages:

b. $w \in \{0,1\}^* | w$ contains '111' as a substring and does not contain '00' as a substring

c. $w \in \{a,b,c\}^*$ — in w the number of a's modulo 2 is equal to the number of b's modulo 3

4

Different programming languages use different notations to represent integers. Construct a regular expression for each one of the following:

c. Currency, in dollars, represented as a positive decimal number rounded to the nearest one-hundredth. Such numbers begin with the character $, have commas separating each group of three digits to the left of the decimal point, and end with two digits to the right of the decimal point, for example, $8,937.43 and $7,777,777.77.

5

Write a regular expression for each of the following languages:

e. Given an alphabet E = (+, -, X, ÷, (,), id], L is the set of algebraic expressions using addition, subtraction, multiplication, division, and parentheses over ids.

7

Consider the three regular expressions:

$$(ab|ac)^*$$

$$(0|1)^*11001^*$$

$$(01|10|00)^*11$$

    a. Use Thompson's construction to construct an NFA for each RE.

    b. Convert the NFAS to DEAS.

    c. Minimize the DFAs.