CS 421 — Regular Expression Activity

Regular Expressions

1. Write a regular expression for the following kinds of words

   - hexadecimal numbers
   - numbers in scientific notation
   - file names ending in `.C`
   - numbers between 0 and 255

2. Describe in English the following regular expressions

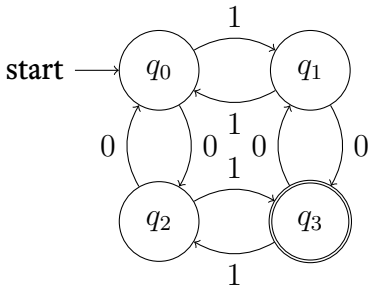
   - `[a-zA-Z][a-zA-Z0-9]+`
   - `[a-z]*(es|ed|ing)`
   - `<[a-z0-9]+@[a-z0-9]+(\.[a-z0-9]+)+>`

3. Which of the following can be described by regular expressions?

   - All the words in the English language
   - All the Fibonacci numbers
   - "All Your Base Are Belong To Us" video
   - Numbers that are multiples of 4 (assume $>=$ 2 digits)
   - Words that have exactly as many `a`s as they have `b`s
   - Palindromes

NFA's and DFA's

4. What kind of strings will this state machine accept?



5. Draw an NFA that accepts even binary numbers.

6. Draw a DFA that accepts even binary numbers.

7. Give an equivalent right-linear grammar for the regular expression `ba+bc+b`.

8. Give an equivalent right-linear grammar for the regular expression `b(aa|cc)+b`.

9. Give an equivalent right-linear grammar for the regular expression `b(a+|c+)b`.