

COS126 Regular Expressions, DFAs (Chapter 5)

Part 1

Consider the regular expression $((C|D|M|N|P|T)A)^*$

- Is PAPA matched by this RE? Is MAMAN? Is NAPA? Is TAMPA?
- Name two countries that are matched by this RE.

Part 2 — RElay Race

Write regular expressions for the following languages:

1. all binary strings
2. all non-empty binary strings
3. all binary strings beginning and ending with 1
4. all binary strings ending with 00 (divisible by 4)
5. all binary strings with at least three 1s

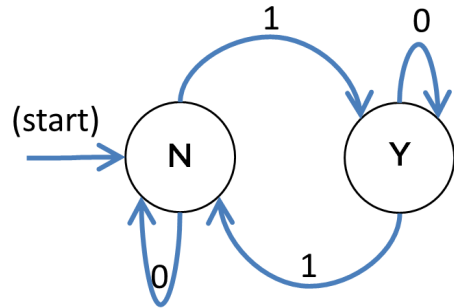
Part 3

Given an English-language description of the language defined by the RE $(0^*10^*10^*)^*$?

Bonus

Hard bonus: is it possible to define a RE for all binary integers divisible by 3?

Part 4



- Is 01101 accepted by this DFA? Is 11?
- Given an English-language description of the language that this DFA recognizes.
- (Optional) Give a regular expression that defines the same language.

Part 5

Draw DFAs that recognize each of these languages from Part 2:

1. all binary strings
2. all non-empty binary strings
3. all binary strings beginning and ending with 1
4. all binary strings ending with 00 (divisible by 4)
5. all binary strings with at least three 1s