

CSCB36 Online Discussion 2

P1: Describe a language using neither regular expressions nor DFSAs, and give two proofs that your language is regular.

$$L = \{1^m 0^n 1^{2o+1} \mid m, n, o \geq 0\}$$

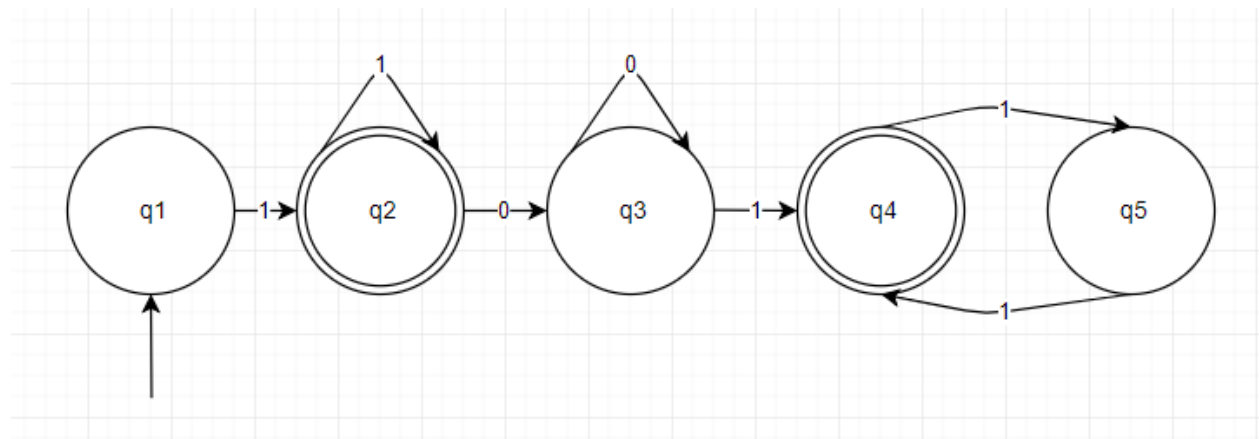
First Proof

The regular expression can be denoted as:

$$R = (1)^*(0)^*(11)^*1$$

Informally our regular expression is correct since $(1)^*$ represents all combinations of the string 1 and $(0)^*$ represents all the combinations of the string 0, also $(1)^*1$ represents an even amount of the string 1 followed by 1 more leading to an odd amount of 1's. Which results in any combination of 1's followed by any combinations of 0 followed by an odd combination of 1's

Second Proof



State Invariant:

Q1 if $|x| = 0$

Q2 if $|x| > 0$ and string only contains only 1's

Q3 if $|x| > 0$ and string contains any amount 1's followed by any amount of 0's

Q4 if $|x| > 0$ and string contains any amount 1's followed by any amount of 0's followed by an odd amount of 1's

Q5 if $|x| > 0$ and string contains any amount 1's followed by any amount of 0's followed by an even amount of 1's