CSC341 Lab 3A

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1 Syntactic Sugar

(1) RR^*
(b) $\epsilon \cup R$
(c) $c_1 \cup c_2 \cup ... c_k$
(d) R^n
(e) $\Sigma^* R$

2 Reading Regular Expressions

(1) 01,0011 / 010,0110
(2) 0101,010101 / 0110,0011
(3) 01,11 / 01,10
(4) 1,01 / 001,111
(5) 111,111111 / 0,011
(6) 0011000, 1011111000 / 0000000,1111111

3 Creating Regular Expressions

(1) 1^*0^*. This is because in order for the string to not contain 01, there must not be a 1 following a 0; that is, the string must contain all its 1s before all its 0s. As a string containing 101 automatically contains 01, we only check for containing 01.

(2) $0(\Sigma\Sigma)^* \cup 1\Sigma(\Sigma\Sigma)^*$. This is because $(\Sigma\Sigma)^*$ matches any even length string, and therefore preceding it with 0 or 1Σ results in an odd or even length string respectively.
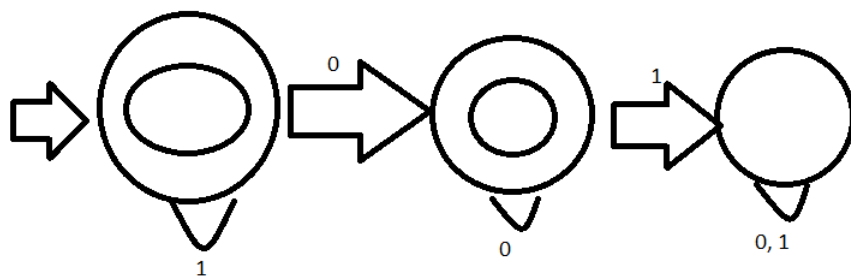
Figure 1: The DFA for 3-1, capturing strings that do not contain 01 or 101.
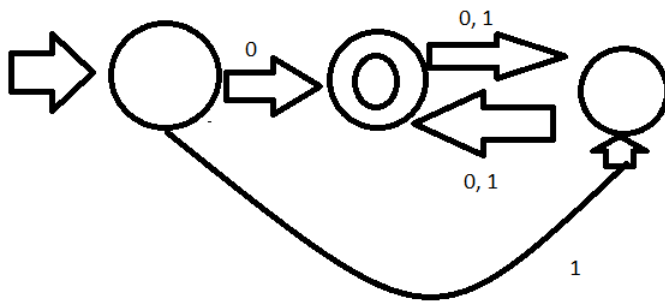
Figure 2: The DFA for 3-2, capturing strings that start with 0 and have odd length or start with 1 and have even length.