Aleksas Murauskas 260718389

Q. 2.999

a. Show $L_{Reg} \notin Reg$

Let $\Sigma = \{0, 1, \cup, \circ, *, (,), \emptyset, \epsilon\}$

Define $L_{Reg} = \{w \in \Sigma^* \mid w \text{ is a regular expression}\}$

c. $L_{Reg} \notin Reg$

Prove by pumping Lemma

Assume L_{Reg} is Reg

The Parentheses must be balanced to be a regular expression

let w contain n left parentheses followed by n right parenthesis.

let $w = xy^iz =$ y must be nonempty

let y contain one (, x the remaining (and z holds the balanced number of).

if we pump y, the xyyz will have an imbalance of left and right parentheses.

therefore L_{Reg} is not regular.