CS 302
QUIZ 2

26 October, 2020

ANSWERS

(a) *(5 pts)* L_1 *is a regular language accepted by the NFA A below*
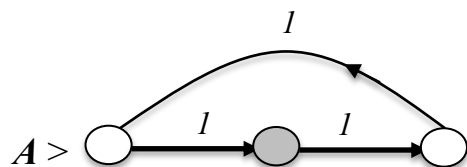
(b) *(5 pts)* L_2 *is **NOT** regular.*

Let N be the no. of states of X accepting L_2

Choose $w = 0^{N+1}.1^N \in L_2$ *, thus* $|w| = 2N+1 > N$

$x.y.z = 0^{N+1}.1^N \in L_2$ *, with* $|x.y| \leq N$ *;* $|y| > 0$ ***hence***

$x.y = 0^p$ *,* $y = 0^q$ *,* $x = 0^{p-q}$ *,* $z = 0^{N+1-p}.1^N$ *so* $x\,y^j\,z$ *at* $j=0$ *is* $xz = 0^{p-q}\,0^{N+1-p}.1^N$

$= 0^{N+1-q}.1^N \notin L_2$ *since* $q > 0$ *a contradiction to* **PL**