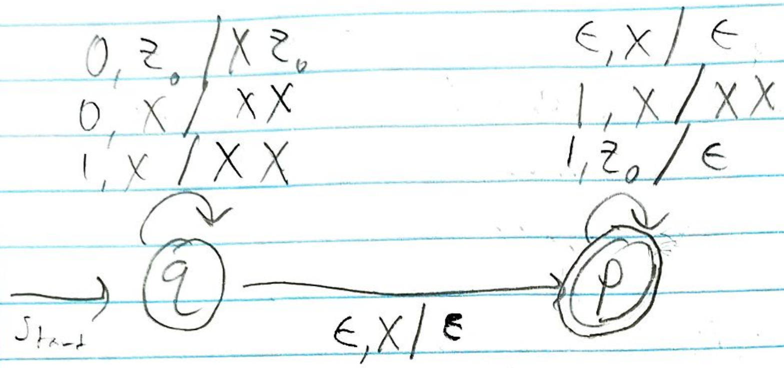
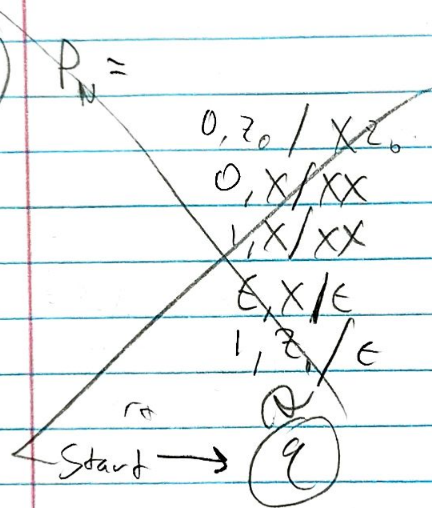
HW 6 Alex Mandzyuk

1) a)

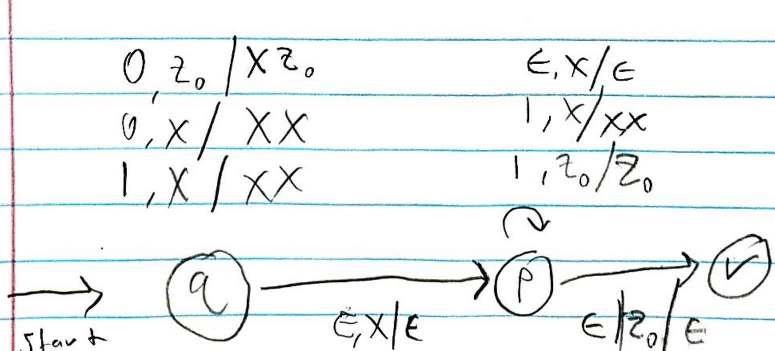
$P_F = (\{q, p\}, \{0,1\}, \{Z_0, X\}, \delta, q, Z_0, \{p\})$



b) $P_N =$



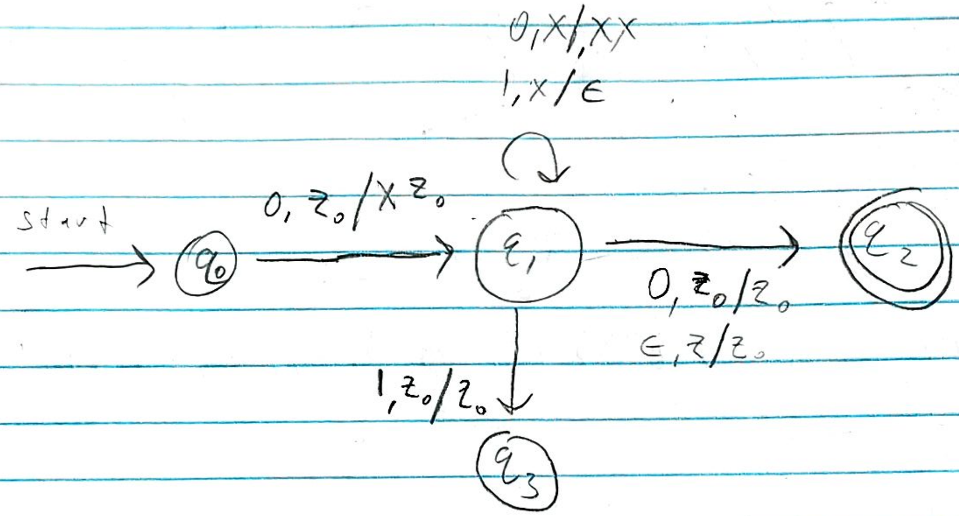
b) $P_N (\{q, p, r\}, \{0,1\}, \{Z_0, X\}, \delta, q, Z_0)$



2) 6.2.1 b, c

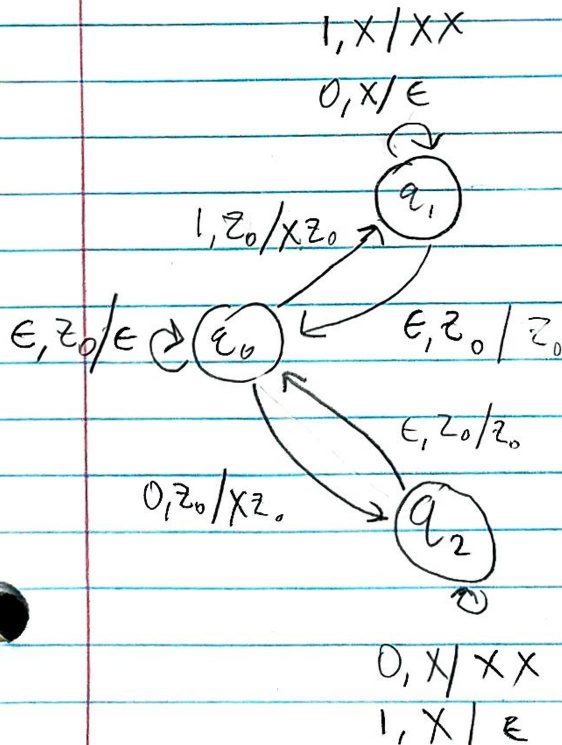
b) Set of all strings s.t. no prefix has more 1's than 0's. Accept by <u>final state</u>

$P_F = (\{q_0, q_1, q_2, q_3\}, \{0,1\}, \{Z_0, X\}, \delta, q_0, Z_0, \{q_2\})$



c) Set of all strings of 0's and 1's with an equal number of 0's and 1's

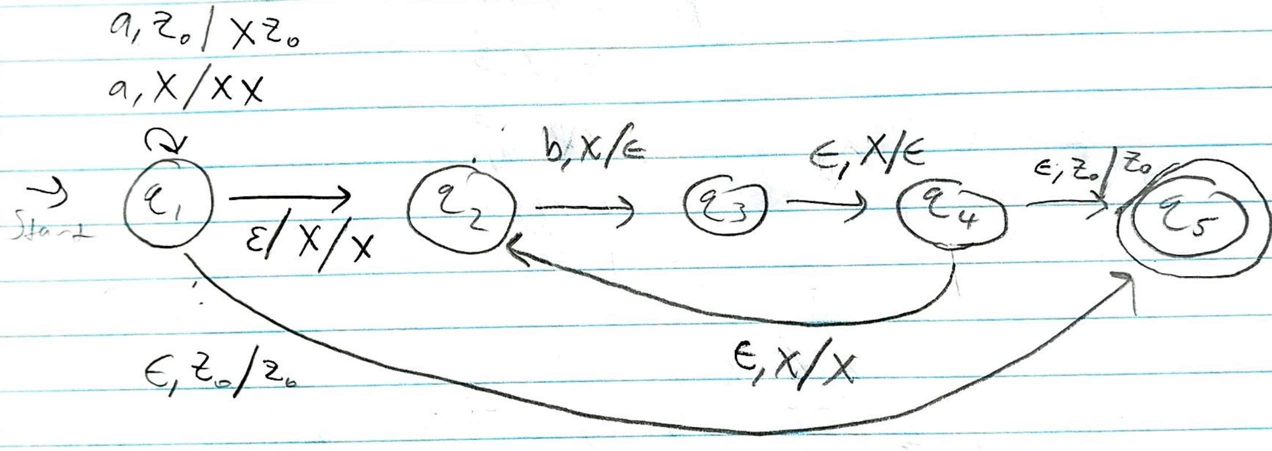
Accepting by <u>empty stack</u>



$P_N = (\{q_0, q_1, q_2\}, \{0,1\}, \{Z_0, X\}, \delta, q_0, Z_0)$

aaaabb

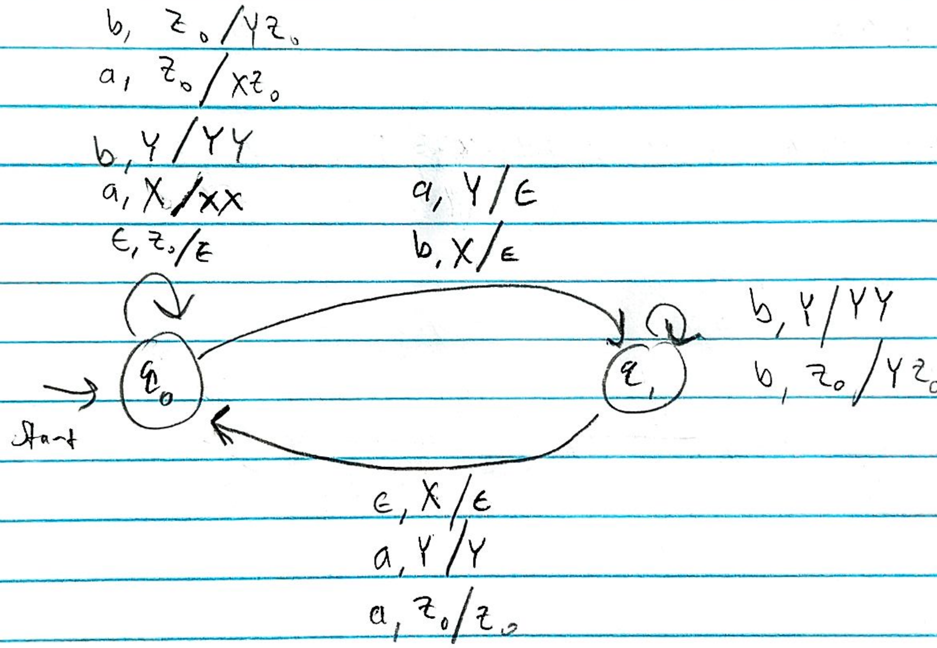
3) $L = \{ w \mid w \text{ is of the form } a^{2n} b^{n},\ n \geq 0 \}$



$P_F = (\{q_1, q_2, q_3, q_4, q_5\}, \{a, b\}, \{X, Z_0\}, \delta, q_1, Z_0, \{q_5\})$

Accepting by final state

4 $P_N = (\{q_0, q_1\}, \{a, b\}, \{X, Y, Z_0\}, \delta, q_0, Z_0)$



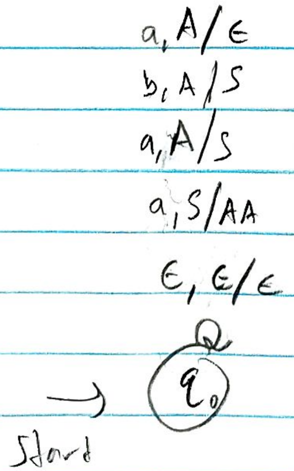
Accept by empty stack

5) Convert the grammar

$$S \to aAA$$
$$A \to aS \mid bS \mid a$$

to a PDA that accepts the same language by empty stack

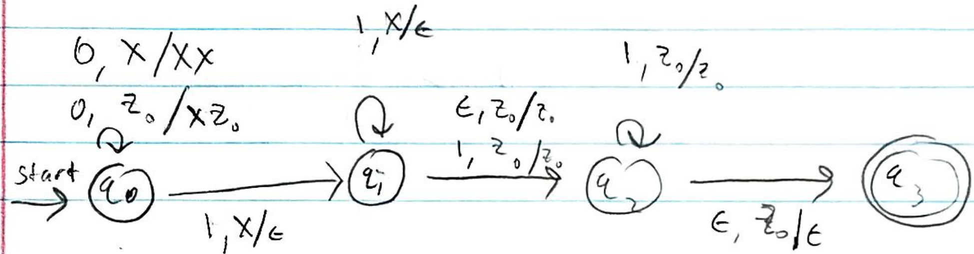
$$P = (\{q_0, q_1\}, \{a, b\}, \{a, b, S, A\}, \delta, q_0, S\}$$



6) Give deterministic PDA to accept:

a) $\{0^n 1^m \mid n \leq m\}$ by final state

P: $(\{q_0, q_1, q_2, q_3\}, \{0,1\}, \{Z_0, X\}, \delta, q_0, Z_0, \{q_3\})$



b) $\{0^n 1^m \mid n \geq m\}$ by final state

P: $(\{q_0, q_1, q_2, q_3\}, \{0,1\}, \{Z_0, X\}, \delta, q_0, Z_0, \{q_3\})$