CS 301 THEORY OF AUTOMATA
ASSIGNMENT 3: TURING MACHINES

Due: Thursday 21st November, 2019.

PROBLEM 1

Make the transition diagrams of a single tape deterministic Turing machine for the following languages. Also, describe your logic/algorithm.

a. L_MUL = $\{0^x\#1^y\#0^{x*y} \mid x>=0, y>=0\}$.
b. L_POWER = $\{0^n\#1^x \mid n>=0 \text{ and } x = 2^n\}$. Hint: Use the property that with every additional zero the number of ones would double.
c. L_POWER = {w | w has twice as many ones as zeros}. Examples of strings in this language are: {101, 011011, 101110110,...}