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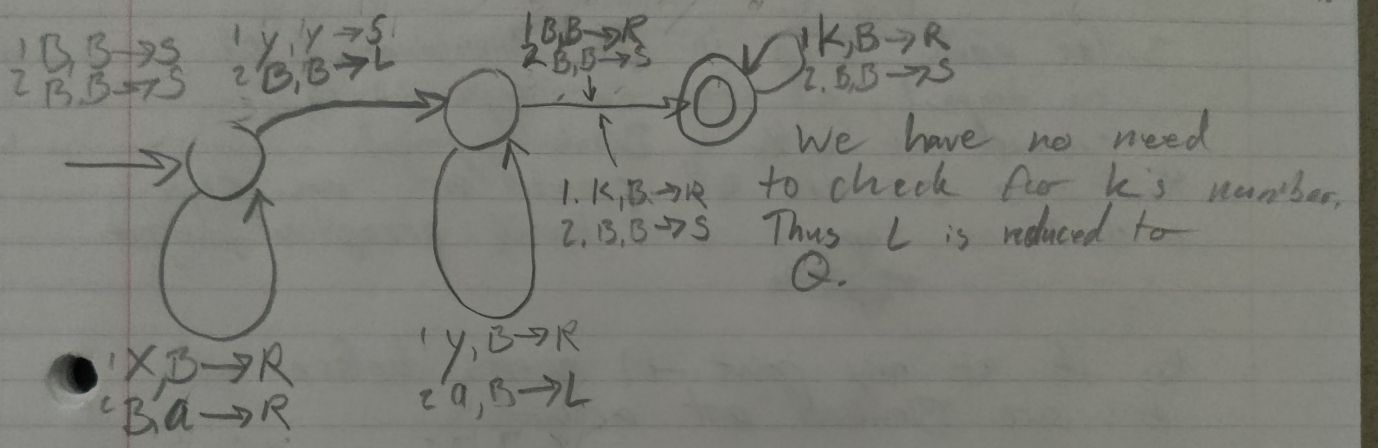
CS 252 HW 8

1. Consider TM X where Tape 1 holds the input string from L.
Tape 2 is empty and will hold a equivalent string from Q.



We have no need to check for k's number. Thus L is reduced to Q.

2. Let B = {<M> | M is a single tape TM that writes a Blank symbol over a nonblank symbol when run on input w}

Consider the ATM problem is reduced to B. Assume there is a TM X that decides B. We will use TM X to decide ATM in a machine TM Y.

Y = on input <M, w>
1. Using M, and w make a TM F that simulates M if accepts w writes a Blank symbol on the first nonblank symbol
2. Run X on F. X will check if the string w, and TM F are different lengths.
3. If R accepts, accept else reject! Contradiction! undecidable!