

**Theory of Computation, CSCI 438 spring 2022**  
**Variations of Turing Machines, pg. 176, March 24<sup>th</sup>**

$TM_{\text{Stay}}$  – similar to a TM but has three possible moves, left, right or stay.

Theorem: A language is Turing-recognizable iff some Turing machine with stays recognizes it.

$TM_{\text{InfiniteTape}}$  - similar to a TM but has an infinite tape in both directions.  
Say that the entire tape is blank, except for the input which is in contiguous cells with the read/write head pointed at the leftmost input symbol. (This is Problem 3.11)

Theorem: A language is Turing-recognizable iff some infinite tape Turing Machine recognizes it.

$TM_{\text{Reset}}$  - similar to a TM but instead of the left move, it has a reset move which returns the read/write head to the front of the tape. (Problem 3.12)

Theorem: A language is Turing-recognizable iff some Turing Machine with reset (and no left move) recognizes it.