

**Theory of Computation, CSCI 438 spring 2022**  
**More practice building Turing Machines, March 23<sup>rd</sup>**

1. Create a Turing machine “procedure” that:
  - a. Inserts a \$ (where  $\$ \notin \Sigma$ , the alphabet of the language) to the front of a tape, shifting the non-blank contents of the tape one place over to the right.
  - b. Returns the read/write head to the front of the tape, pointing at the first input symbol after the \$ (the second cell of the tape).

You can assume that this procedure will only be called at the beginning when there are only symbols from  $\Sigma$  or blank on the tape.

2. Create a Turing Machine that accepts  $L = \{0^{2^n} : n \geq 0\}$ . (This is 0 raised to the  $2^n$  power) (This is example 3.7, page 171, in text.)