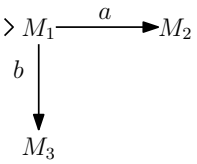
Theory of Computation, Fall 2022
Assignment 7 (Due November 14 Monday 10:00am)

Q1. Fix an alphabet Σ contians $\triangleright$ and $\sqcup$. Given a precise definition for the head-moving machine $M_{\rightarrow}$, which, regardless of the symbol it reads, always moves its head to the right and then halt immediately.

Q2. Let $\Sigma = \{a, b, c, \triangleright, \sqcup\}$. Let $M_i = (K_i, \Sigma, \delta_i, s_i, H_i)$ for $i = 1, 2, 3$ be three Turing machines. Give the definition of the following Turing machine in terms of M_1, M_2, M_3.



Q3. Design a right-shifting machine $S_{\rightarrow}$ that transforms $\triangleright \sqcup w \underline{\sqcup}$ into $\triangleright \sqcup \sqcup w \underline{\sqcup}$, where w is a string that contains no blank symbol. You may use the machines and the diagrams we presented in class.