Assignment 5

Overview

This assignment is about Turing Machine section.

Rules and Deliverables

This is an individual assignment.

- The assignment is due on **Friday 11/08/24 at 11:59 pm**
- Submitting the assignment 24 hours after the due date will result in a deduction of 20% from the student's grade.
- Each student should submit the answer in PDF format on Canvas.
- Students are responsible for submitting all the files before the due date. Please check the submitting files to make sure all the answers are submitted correctly.

Assignment Description

1) What is the output of the following Turing machine while the input is 1101. B represents blank. (5 points)
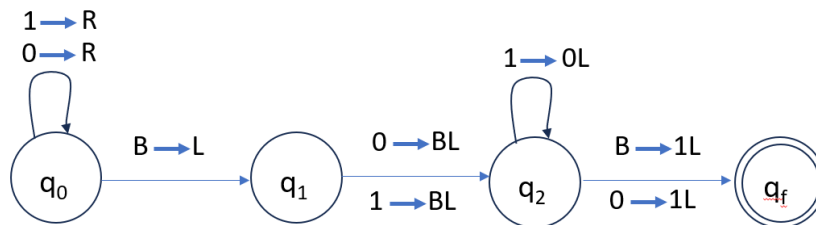
2) Find a Turing machine that accept the following language. (15 points)

$$L = \{a^n b^{2n} \mid n \geqslant 1\}$$

3) Find a Turing machine that computes the remainder of its input when divided by 3 while each number is represented by 1's.
   If the remainder is zero, output should be one zero on the tape.
   If the remainder is greater than zero, output should start with one zero following by the remainder.
   For example, an input tape containing the number 8:
   Input: B11111111B (B represents blank)
   executing should leave the number 2 on the tape, because 2 is the remainder of 8 when divided by 3. Output: 011   (20 points)