Chapter 5.1 Practice

Using the modified TM concept of showing $A_{TM} \leq E_{TM}$ of:

- TM M_w: "on input x:

    1. If $x \neq w$, reject

    2. If $x = w$, run M on w:

        1. Accept if M accepts w.

        2. Reject if M rejects w."

Use the approach above to show that the following languages are undecidable.

1. $L_1 = \{< M > | M \text{ is a TM and } 01 \in L(M)\}$

2. $L_2 = \{< M > | M \text{ is a TM and } 01 \cup 10 \ L(M)\}$

3. $L_3 = \{< M > | M \text{ is a TM and } (10)^* \ L(M)\}$