CSCI 338
Homework 7

Assigned 10/18/2022, due by start of class (3:05 pm) on 10/25/2022. Please submit this assignment to the appropriate dropbox on D2L. You must follow the collaboration policy detailed on the course website.

Due to the close proximity of the due date for this assignment and Quiz 2, no late submissions will be accepted for this assignment. This will allow solutions to be discussed in class on 10/25 in preparation for the quiz.

Problem 1 (10 points). Show that the following language is undecidable:
$FINITE_{TM} = \{\langle M \rangle : M$ is a TM and accepts a finite number of strings$\}$

Problem 2 (10 points). Show that the following language is undecidable:
$HALT - \epsilon_{TM} = \{\langle M \rangle : M$ is a TM and halts on blank input (i.e. ϵ)$\}$

Problem 3 (10 points). Show that the following language is undecidable:
$EVEN_{TM} = \{\langle M \rangle : M$ is a TM and $L(M)$ contains every string of even length$\}$