CSCI 538 Computability

Assignment 2 (10 marks)

Question 1 (2 marks)

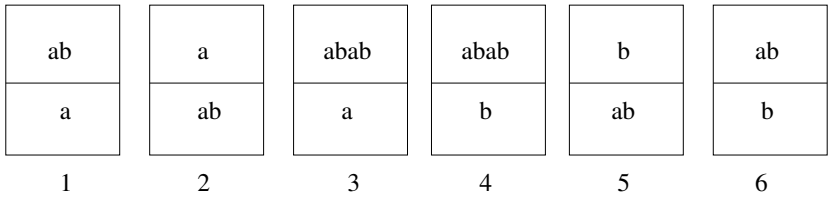
Let $T = \{< M > | M$ is a TM that accepts w^R whenever it accepts $w\}$. Show that T is undecidable.

Question 2 (2 marks)

Show that A is Turing-recognizable if and only if $A \leq_m A_{TM}$.

Question 3 (2 marks)

In the following instance of the Post Correspondence Problem, is there a match? Why?



The 6-card PCP instance for question 3.

Question 4 (2 marks)

Let $EQ_{DFA} = \{< G, H > | G, H$ are DFA's and $L(G) = L(H)\}$. Show that EQ_{DFA} is in P.

Question 5 (2 marks)

Define SD-SSUM as the problem where you are given a set of positive integers $S = \{a_i | a_i$ has a single decimal digit for $i = 1, ..., n\}$ and another positive integer C, and you need to decide whether there exists a subset of integers in S which sum to C. Show that SD-SSUM is in P.

Date Due: 8:30pm, **Thursday, Feb 22, 2024.** You should upload your assignment in pdf format on D2L, under the "Assignment 2" directory.