**University of Nevada, Las Vegas Computer Science 456/656 Fall 2026**

**Assignment 6: Due Saturday November 14, 2026, midnight**

**Name:**_____

You are permitted to work in groups, get help from others, read books, and use the internet. Turn in the assignment as instruced by the Graduate Assistant, Sabrina Wellace, `wallace4@unlv.nevada.edu`

1. Prove that if $L$ is $\mathcal{RE}$ and $w \in L$, there is a proof that $w \in L$.

2. Prove that the context-free grammar equivalence problem is co-$\mathcal{RE}$. Hint: Look at Problem 1 above.

3. Prove that every language that can be enumerated in canonical order by some machine is decidable.

4. Prove that every language accepted by a machine is recursively enumerable.

5. Prove that the halting problem is undecidable.

6. Prove that every regular language is $\mathcal{NC}$. Hint: Look at the proof, using the tournament method, that finding the maximum item in a row of items is $\mathcal{NC}$

7. Read the handout lalrhandout1.pdf. Staple extra sheets for the problems below..

   (a) Work problem 2 on page 3 of the handout lalrhandout1.pdf.

   (b) Work problem 3 on page 4 of the handout lalrhandout1.pdf.

   (c) Work problem 4 on page 4 of the handout lalrhandout1.pdf.

   (d) Work problem 5 on page 5 of the handout lalrhandout1.pdf.

   (e) Work problem 6 on page 5 of the handout lalrhandout1.pdf.

   (f) Work problem 7 on page 5 of the handout lalrhandout1.pdf.

   (g) Work problem 8 on page 6 of the handout lalrhandout1.pdf.

   (h) Work problem 9 on page 6 of the handout lalrhandout1.pdf.

8. Read the handout lalrhandout2.pdf. Staple extra sheets for the problems below.

   (a) Work problem 1 on page 1 of the handout lalrhandout2.pdf.

   (b) Work problem 2 on page 2 of the handout lalrhandout2.pdf.

   (c) Work problem 3 on page 2 of the handout lalrhandout2.pdf.

   (d) Work problem 4 on page 2 of the handout lalrhandout2.pdf.

   (e) Work problem 5 on page 3 of the handout lalrhandout2.pdf.

   (f) Work problem 6 on page 4 of the handout lalrhandout2.pdf.