University of Nevada, Las Vegas Computer Science 456/656 Fall 2025
Assignment 1: Due Saturday January 25, 2025, 11:59 PM

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 Teaching Assistant.

Currently, no teaching assistant has been assigned, but I have been told that one will be assigned before the end of the first week of classes.

1. Indicate which of the following sets are countable by **C**. If the set is uncountable, write **U**.

   (a) _____ $\mathbb{Z}$ the set of integers.

   (b) _____ $\mathbb{Q}$ the set of rational numbers.

   (c) _____ $\mathbb{R}$ the set of real numbers.

   (d) _____ $\{0.1\}^*$ The set of strings over the binary alphabet $\{0, 1\}$.

   (e) _____ $2^{\{0.1\}^*}$ The set of languages over the binary alphabet $\{0, 1\}$.

2. Prove that $\sqrt{2}$ is irrational.