Tennessee Technological University
Programmable Logic Controllers
Pre-Lab 3

1 Introduction

Make sure to complete this pre-lab before your assigned lab time. You will not be allowed to begin working on your lab without having this complete.

2 Background

In the coming lab we will be using math and compare instructions. However, there are some instructions that are out of bounds. Specifically, those listed at the beginning of the Lab 3 manual. Don't use any of the prohibited instructions in this pre-lab either.

3 Problem 1

The first problem is to calculate the modulo of two operands without using the modulo command. To get more information regarding the modulo operation in general, refer to wikipedia.

Write a ladder logic program on paper to calculate the modulo operation (written as %) of `OperandA` and `OperandB`. You are only allowed to use instructions for truncate, multiply, divide, add, and subtract. You are obviously not allowed to use the mod instruction. Store the result in `Calculated_Modulo`.

> —Note 1— *The TRN instruction can be found in the Allen Bradley instruction set manual that is available. The truncate instruction removes the decimal portion of a number and leaves it whole without any rounding. ie. $TRN(6.1) = 6.0$ and $TRN(6.99) = 6.0$*

4 Problem 2

Write a ladder logic program on paper to store x and y coordinates for a given `Angle` on the unit circle in `x` and `y` respectively.

Hint: The unit circle has a radius of 1. Use this information and the sin/cos instructions to accomplish this.

5 Problem 3 - Read the Manual

Read the lab manual. Then write a paragraph about the content and expectations in the lab manual which will convince the grader that you have in fact read the complete lab manual.