

ISE 589-006 Introduction to Modern Industrial Automation Homework Assignment 3 Due: March 10th, 2023

This homework assignment is related to the sequential programming of a PLC and application of Industrial Internet of Things

Problem 1. (10 points)

Construct the truth tables for the following output expressions of inputs A, B, and C, and the output Y. Do not simplify the expression.

$$Y = (\bar{A} + \bar{B}) * C$$

A	B	C	\bar{A}	$\bar{A} + \bar{B}$	Y
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

Problem 2. (65 points)

The Micro800 series PLC is use to apply the output signal Y. The system is desired to have the following configuration. Using the Micro800 simulator:

A	_IO_EM_DI_00
B	_IO_EM_DI_01
C	_IO_EM_DI_02
D	_IO_EM_DO_00

- A. Assign Alias for the above contacts and coils **(5 pts)**
- B. Design a program using structured text **(20 pts)**
- C. Design a program using ladder logic to perform the above task **(20 pts)**
- D. Design a program using function block diagram to perform the above task **(20 pts)**

Problem 3. (25 points)

Review the following article:

Krejčí, J., Babiuch, M., Babjak, J., Suder, J., & Wierbica, R. (2022). Implementation of an Embedded System into the Internet of Robotic Things. *Micromachines*, 14(1), 113.
<https://doi.org/10.3390/mi14010113>

What system parameters did the Industrial IOT System monitor and why? **(10 pts)**

What is Thingworx and how is it used in this application **(15 pts)**