

Midterm2: IoT2

Due Date: See Website

Q: Write, simulate, and demonstrate using Atmel Studio 7 a C code for the AVR ATMEGA328p microcontroller that performs the following functions:

1. Program the I2C of ATmega328/p to read RGB/Ambient Light data from APDS 9960 sensor.
2. Display the value to UART.
3. Make sure the AT Firmware is downloaded into the ESP-01/ESP32 module.
4. Register for a free Thingspeak account with MATHWORK. Setup and get the channel Key.
5. Transmit Lux sensor value to ESP-01/ESP32 through UART port using AT Commands.
6. Display the Lux sensor value as a graph in Thingspeak

Submission:

The following are required for successful completion of the design assignment:

- a. AVR C code that has been assembled and working.
- b. The C code should be well documented with explanation of every instruction.
- c. A word document that contains the flow chart of the assembly code along with the screenshots/snapshot of the Atmel Studio 7 and/or live connections during debugging at the beginning and end of Task 1-6.
- d. Submit one solution folder, with doc and video/snapshot file

Points:

Task 1~6: 100%. (Code=60%, Documentation=20%, Verification/Snapshots=20%)

Evaluation Rubrics:

See class website for the Midterm evaluation rubrics.

Helpers:

Flash AT-Firmware on ESP-12E.pdf

AVR to ESP-12E.pdf