Midterm1: IoT 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 ADC of ATmega328/p to read the LM34/35 temperature 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 temperature sensor value to ESP-01/ESP32 through UART port using AT Commands.
6. Display the temperature 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