Design Assignment 1A: Due Date: See Website

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

1. Perform a multiplication of a 16-bit multiplicand with an 16-bit multiplier without using the MUL instruction. Use iterative addition to perform the above multiplication.
2. Registers R25:R24 hold the 16-bit multiplicand, R23:R22 hold 16-bit multiplier, and R20:R19:R18:R17 should hold the result.
3. Verify your algorithm and answers using the AVRs 'MUL' instruction or C or any high-level program.
4. Determine the execution time @ 16MHz/#cycles of your algorithm using the simulation.

Submission:

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

a. AVR assembly code that has been assembled and working. Only the source files required.
b. The assembly code should be well documented with explanation of every instruction.
c. A word document that contains the assembly code along with the screenshots of the Atmel Studio 7 during debugging at the beginning and end of Task 1.
d. Submit one solution folder, with doc and video/snapshot file. See assignment submission guidelines through github posted in the class website.

Points:
Task 1~4: 100%. (Code=60%, Documentation=20%, Verification/Snapshots=20%)

Evaluation Rubrics:
See class website for the DA evaluation rubrics.