CpE 3150

Fall 2017 Semester Project

Due November 30 (Firm deadline)

This is a group project, to be worked on and completed in collaboration with the group to which you were assigned in class.

One final report is due per group.

A number of groups, selected randomly, will be asked to demonstrate the compilation and execution of their code.

Your task is to expand the functionality of the 8051 microprocessor using a fast adder-based on carry look-ahead approach. You are expected to write and test an assembly program that mimics the carry look-ahead adder we discussed in class. Please note that in class, the basic building block was a 4-bit adder. For this project, your basic building block should be an 8-bit adder.

1) Input operands in hexadecimal format, variable lengths, ranging from 8 to 64 bits (in increments of 8 bits) should be supported. For the sake of simplicity, assume unsigned numbers.
2) For each pair of input numbers, your program should generate the input operand values followed by:
   a. their sum (in hexadecimal), and
   b. the number of clock pulses it took to calculate this sum.
3) Test data will be made available on November 16. Your report should show that your program operates correctly for this test data.
4) Your final report should include:
   a. a description of your overall approach and the logic of your program,
   b. pseudo code for your assembly program,
   c. a table that shows the output (sum and number of clock pulses) for each pair of input operands (from the test data),
   d. a curve showing the number of clock pulses vs. the operand length, and
   e. a hard copy of your assembly program.
5) Please note that the deadline is firm and will not change under any circumstances.