CS 4341 Computer Architecture

Homework 5

1. Show how the time-iterative multiply algorithm calculates 23×25 in a k=6-bit system, giving a 12-bit result. Here 23 is the multiplier and 25 is the multiplicand. Show your working.

2. Repeat question 1 with a multiplier of 25 and a multiplicand of 23. Show your working as above.

3. Repeat question 1 with a multiplier of 23 and a multiplicand of -25.

4. Repeat question 3 with a multiplier of -25 and a multiplicand of 23. After all 6 iterations have completed apply a correction step by subtracting the multiplicand from the U register. Show your working as above.

5. Repeat question 4 with a multiplier of -25 and a multiplicand of 23, but this time, instead of applying the correction step after all 6 iterations, subtract the multiplicand in the last iteration when the multiplier is negative.

6. Repeat question 5 with a multiplier of -25 and a multiplicand of -23. Again, subtract the multiplicand in the last iteration.