Department of Electrical and Computer Engineering
EEC70   **Assembly Language and Computer Organization**   Winter 2001
Program Assignment#3

Due on Tuesday, March 6 at 11:59 P.M.

Write a program that takes two integers (each of them is maximum 16-bit) and multiplies the two integers using the following algorithm:

Step 0:   product=multiplier

Step 1:   Check the least significant bit of the product

Step2:   If it is one, add multiplicand to the left half of the product and place the result in the left half of the product register. Then shift the product register right 1 bit.

If the least significant bit is zero just shift the product register right 1 bit.

Step3:   Go to step 1

To get the final result (32-bit product register) the loop (step 1 through step 3) should be repeated for 16 times.

Here is an example for multiplying two 4-bit integers. Thus product is an 8-bit register and it will be shifted to right for four times by the end of the program.

Suppose Multiplicand is 2 and Multiplier is 3:

Iteration	Step	Multiplicand	Product
0	Initial values	0010	0000 0001
1	Product=Product+Multiplicand	0010	0010 0011
	Shift Product 1 bit right	0010	0001 0001
2	Product=Product+Multiplicand	0010	0011 0001
	Shift Product 1 bit right	0010	0001 1000
3	Shift Product 1 bit right	0010	0000 1100
4	Shift Product 1 bit right	0010	0000 0110

1. You aren't allowed to use "add" instruction. Instead, you can write a procedure to simulate its function by using other instructions (including "addi").

2. Your program should continue getting two new integers after each multiplication until the user puts 0 for both multiplier and multiplicand.