ECE 1195 Lab 4 Multiplication

The way I tested multiplication were with the following commands:

LUI $1 0xF1E8

ORI $8 $0 0x0011

SRA $2 $1 8

MULTU $1 $2

MFHI $1

MFLO $2

LW $1 15($8)

LW $2 19($8)

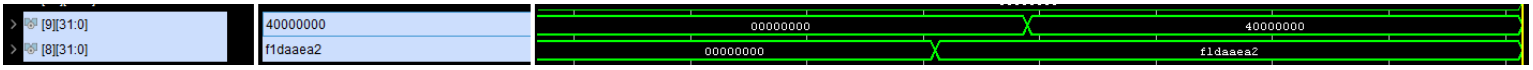
I verified the multiplication was successful through an online multiplication calculator and checking the memory table for the high and low registers.

LUI $1 0xF1E8 = F1E80000

SRA $2 $1 4 = FFF1E800

So HighReg = F1DAAEA2

And LowReg = 40000000




```
source TestMultiply.tcl
# restart
INFO: [Simtcl 6-17] Simulation restarted
# add_force {/cpu_tb/U_1/mw_U_0ram_table[0]} -radix hex {3C01F1E8}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[1]} -radix hex {34080011}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[2]} -radix hex {00011203}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[3]} -radix hex {00220019}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[4]} -radix hex {00000810}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[5]} -radix hex {00001012}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[6]} -radix hex {AD01000F}
# add_force {/cpu_tb/U_1/mw_U_0ram_table[7]} -radix hex {AD020013}
# add_force clk 1 {0 5ns} -repeat_every 10ns
# add_force reset 0
# run 2500ps
# add_force reset 1
# run 5 ns
# add_force reset 0
# run 500 ns
# if { [get_value -radix hex {/cpu_tb/U_1/mw_U_0ram_table[8]} ] == {fldaaea2} && [get_value -radix hex {/cpu_tb/U_1/mw_U_0ram_table[9]} ] == {40000000}} {
#     puts "Multiplication Passed"
# } else {
#     puts "Multiplication Failed"
# }
Multiplication Passed
# puts [get_value -radix hex {/cpu_tb/U_1/mw_U_0ram_table[8]}  ]
fldaaea2
# puts [get_value -radix hex {/cpu_tb/U_1/mw_U_0ram_table[9]}  ]
40000000
```

Hex Calculator

Hexadecimal Calculation—Add, Subtract, Multiply, or Divide

Result

Hex value:
F1E80000 × FFF1E800 = **F1DAAEA240000000**

Decimal value:
4058513408 × 4294043648 = **1.7427433719945E+19**

F1E80000 × FFF1E800 = ?

Calculate Clear