ICS Homework Sheet #11

**Problem 11.1:**

Algorithm 1 in RISC-V v32i using integer multiplication of 2 and 4:

#Integer multiplication using RISC-V v32i

# Inputs:

# a: a0 (x10 register)

# b: a1 (x11 register)

# Output:

# r: a0 (x10 register)

# temporary r: a0(x12 register)

addi x12, x0, 0 #loading 0 in x12 (temporary r)

addi x10, x0, 2 #loading multiplication value 2 in x10(a)

addi x11, x0, 4 #loading multiplication value 4 in x11(b)

bne x10, x0, +4 #if x10(a) not equal to 0, jump 1 line

andi x5, x10, 1 #if x10 is odd then store 1 in x5

beq x5, x0, +8 #if x5 equal to 0 (i.e even), jump 2 lines

add x12, x12, x11 #add x12(temp r) to x11(b) & store in x12

srli x10, x10, 1 #logical shift right on x10(a)

slli x11, x11, 1 #logical shift left on x11(b)

bne x10, x0, -24 #if x10(a) not equal to 0, jump 6 lines up

addi x10, x12, 0 #storing x12(temp r) in x10(a)

addi x12, x0, 0 #loading 0 in x12 (temp r)

Emulation(https://eseo-tech.github.io/emulsiV/#EAAAABMGAAATBSAAkwVAAGMSBQBN:EAAQAJNyFQBjhAIAMwa2ABNVFQBx:EAAgAJOVFQDjFAX+EwUGABMGAABi:AAAAAf8=)