

Design Assignment 2 – Assembly Language Programming

Josh Tobia

Linh Ngo

Brian Dawson



ELC 411 - Embedded Systems

The College of New Jersey

Department of Electrical and Computer Engineering (ECE)



Date Submitted: 10/2/19

Group Members:

Josh Tobia - Worked on creating code and project

Linh Ngo - Worked on creating code and project

Brian Dawson - Worked on creating code and project

Locals			
Name	Value	Address	Type
t1	0x0000	0x20007FCE (All)	short
t2	0x3FFE	0x20007FCC (All)	short
t3	0x3FFF	0x20007FCA (All)	short
y1	0x0000	0x20007FC8 (All)	short
y2	0x3FFE	0x20007FC6 (All)	short
y3	0x3FFF	0x20007FC4 (All)	short

Figure 1: Variables in Watch Window

Code:

```
.syntax unified
.text
.global inner_prod_asm
.func inner_prod_asm, inner_prod_asm
.thumb_func

Inner_prod_asm:
    // r0 = h; r1 = x; r2= n; r3 = sum; r4= i;
    push {r4, r5, r6, r7}
    mov r3, #0 // sum = 0
    mov r4, #0 // i = 0

loop:
    cmp r4, r2 //comparing r4(i) and r2(n)
    bge continue //if i >= n go to continue
    ldrsh r5, [r0],#2 //Loading the value of h then post incrementing by 2 (2bytes)
    ldrsh r6, [r1],#2 //Loading the value of h then post incrementing by 2 (2bytes)
    mul r7, r5, r6 //temp = h[i]*x[i]
    add r3, r3, r7 //sum = sum + temp
    add r4, r4, #1 //i++
    b loop //branch back to loop

continue :
    asr r0, r3, #16
    pop {r4,r5,r6,r7}
    bx lr

.endfunc
.end
```