**Internet of Things**

**Lab Assignment – 1**

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**Main.c :**

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LAB EXERCISE - SQUARE ROOT APPROXIMATION

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Write an assembly code subroutine to approximate the square root of an

argument using the bisection method. All math is done with integers, so the

resulting square root will also be an integer

GOOD LUCK!

\*----------------------------------------------------------------------------\*/

#include <STM32F4xx.h>

\_\_asm int sqrt\_approx(int x)

{

//Write your code here

push {r4,r5}

ldr r1, =0

ldr r2, =0xffff

ldr r3, =0xffffffff

Loop

mov r5, r3

adds r3, r1, r2

asrs r3, #1

mov r4, r3

muls r4, r3, r4

cmp r4, r0

beq Done

bgt Higher

mov r1, r3

b Cont

Higher

mov r2, r3

Cont

cmp r5, r3

bne Loop

Done

mov r0, r3

pop {r4, r5}

bx lr

}

/\*----------------------------------------------------------------------------

MAIN function

\*----------------------------------------------------------------------------\*/

int main(void){

volatile int a,b,c,d, k=0;

int i;

a = sqrt\_approx(0); // should be 0

b = sqrt\_approx(25); // should be 5

c = sqrt\_approx(133); // should be 11

for (i=0; i<10000; i++){

d = sqrt\_approx(i);

k+=d;

}

while(1)

;

}

// \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*ARM University Program Copyright (c) ARM Ltd 2016\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*