微處理機 LAB 1

110611052 郭宗諺 110611063 林穎沛 PART 1. (50%)

1. 查閱 programming manual, 寫出 MOV, STR, LDR 用法與差異。(30%)

MOV: copies the value of operand2 into operand1

MOV r0, r1 //copies the value of r1 into r0

STR: Store register to memory.

STR r0, [r1] //store the value in r0 to the register which has address r1

LDR: load register with a value from memory.

LDR r0, [r1] //loads r0 from the address in r1.

2. 舉一個暫存器間接定址法的程式碼並說明其運作過程。(20%)

MOV r1, #6 //將數值 6 存入 r1 暫存器

LDR r0, [r1] //將 r1 暫存器的 address 存入 r0

PART 2. (50%) 實作題 請完成實驗 截圖紀錄實驗結果並附上程式碼

- 1. 組內組員,一人一題 (50%)
 - a. 用組合語言寫出 20H 10H 並在 register 中追蹤其數值相加變化

Name ~ 👭 General Registers	Value	Descript General
1010 rO	536870912 (0	Decimal)
1010 r1	536871984 (Decimal)
1010 r2	536872048 (
1010 r3	134218157 ([
1010 r4	536872048 (
Name ∨ ∰ General Registers	Value	Description General Purpose and FPU Register
1910 rO	32 (Decimal)	General Purpose and FPO Register
1010 r1	16 (Decimal)	
1010 r2	536872048 (Decimal)	
1010 r3	134218157 (Decimal)	
500 0 5 0	134218157 (Decimal)	
## r3 ## r4 (x)= Variables ● Breakpoints ### Re Name	536872048 (Decimal)	© Sescription
## r4 (x)= Variables	536872048 (Decimal) egisters 🛭 Modules	Description
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x>= Variables	536872048 (Decimal) egisters Modules Value	Description
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W= Variables	egisters Modules Value 32 (Decimal) 16 (Decimal)	Description General Purpose and FPU Registe

.syntax unified

- .cpu cortex-m4
- .thumb

.text

- .global main
- .equ AA, 0x55

main:

movs r0, #0x20

movs r1, #0x10

sub r2, r0, r1

B main

b. 用組合語言寫出 5H x 9H 並在 register 中追蹤其數值相加變化 (請分別擷取計算前 register 中的值及計算後之值的變化)

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1010 rO	536870912 (Decimal)	
1010 r1	536871984 (Decimal)	
1010 r2	536872048 (Decimal)	
1010 r3	134218157 (Decimal)	
1010 r4	536872048 (Decimal)	

Name ∨ ∰ General Registers	Value	Description General Purpose and FPU Register Group
1010 rO	5 (Decimal)	
1010 r1	9 (Decimal)	
1010 r2	536872048 (Decimal)	
1010	12/210157 (Docimal)	

√ ₩ General Registers		General Purpose and FPU Register Group
1010 rO	5 (Decimal)	
1010 r1	9 (Decimal)	
1010 r2	45 (Decimal)	

.syntax unified

- .cpu cortex-m4
- .thumb

.text

- .global main
 - .equ AA, 0x55

main:

movs r0, #0x05

movs r1, #0x09

mul r2, r0, r1

B main

PART 3. 加分練習,不計入平常成績

Fibonacci serial: 宣告一數值 N (1≤N≤100),計算 Fib(N)並將回傳值存放至 R4 暫存器

Tips: Fib(0) = 0; Fib(1) = 1; Fib(N) = Fib(N-1) + Fib(N-2) for N>1 .syntax unified

- .cpu cortex-m4
- .thumb

.text

.global main

FIB:

cmp r3, r4

bge OUTFIB

add r2, r1, r0

movs r0, r1

movs r1, r2

add r3, r3, #1

B FIB

OUTFIB:

main:

movs r0, #0 //a0

movs r1, #1 //a1

movs r2, #0

movs r3, #0 //i

movs r4, #8 //N

B FIB

B main