Lab Exercise 2 – 19484286

CODE

```
.data

.balign 4

N    : .word 5
Fib : .word 0

.text

.global main

main:
        MOV r1, #1       /*Fibonacci of 0*/
        MOV r2, #1       /*Fibonacci of 1*/
        LDR r3, addr_N   /*Set r3 to the pointer towards N*/
        LDR r3, [r3]     /*dereference N*/
        SUB r3, #1       /*Take one away as Fib(1) was already evaluated*/
        B  loop
loop:
        SUB r3, #1       /*Take 1 from the Fib Count*/
        ADD r0, r1, r2   /*Add n-1 + n-2, store in position n*/
        MOV r2, r1       /*Shift n-1 into n-2*/
        MOV r1, r0       /*Shift n into n-1*/

        CMP r3, #0       /*Compare r5 to 0*/
        BGT loop         /*Returns to loop if r3 > 0*/

        LDR r1, addr_Fib /*Set r1 to pointer for Fib*/
        STR r0, [r1]     /*Load result into Fib*/
        BX  lr           /*End Program*/

addr_N :.word N
addr_Fib : .word Fib
```

Loop Iteration 1

```
Breakpoint 1, loop () at prog2.s:20
20              SUB r3, #1      /*Take 1 from the Fib Count*/
(gdb) info registers
r0              0x2                     2
r1              0x2                     2
r2              0x1                     1
r3              0x3                     3
r4              0x0                     0
r5              0x10414                 66580
r6              0x102e0                 66272
r7              0x0                     0
r8              0x0                     0
r9              0x0                     0
r10             0x76fff000              1996484608
r11             0x0                     0
r12             0x7efff580              2130703744
sp              0x7efff508              0x7efff508
lr              0x76e6e718              1994843928
pc              0x103e8                 0x103e8 <loop>
cpsr            0x20000010              536870928
fpscr           0x0                     0
(gdb)
```

Loop Iteration 2

```
(gdb) info register
r0              0x3                     3
r1              0x3                     3
r2              0x2                     2
r3              0x2                     2
r4              0x0                     0
r5              0x10414                 66580
r6              0x102e0                 66272
r7              0x0                     0
r8              0x0                     0
r9              0x0                     0
r10             0x76fff000              1996484608
r11             0x0                     0
r12             0x7efff580              2130703744
sp              0x7efff508              0x7efff508
lr              0x76e6e718              1994843928
pc              0x103e8                 0x103e8 <loop>
cpsr            0x20000010              536870928
fpscr           0x0                     0
(gdb)
```

Third Iteration

```
(gdb) info registers
r0              0x5                     5
r1              0x5                     5
r2              0x3                     3
r3              0x1                     1
r4              0x0                     0
r5              0x10414                 66580
r6              0x102e0                 66272
r7              0x0                     0
r8              0x0                     0
r9              0x0                     0
r10             0x76fff000              1996484608
r11             0x0                     0
r12             0x7efff580              2130703744
sp              0x7efff508              0x7efff508
lr              0x76e6e718              1994843928
pc              0x103e8                 0x103e8 <loop>
cpsr            0x20000010              536870928
fpscr           0x0                     0
(gdb)
```

Final Iteration and Memory Value at Fib

```
(gdb) info registers
r0              0x8                     8
r1              0x8                     8
r2              0x5                     5
r3              0x0                     0
r4              0x0                     0
r5              0x10414                 66580
r6              0x102e0                 66272
r7              0x0                     0
r8              0x0                     0
r9              0x0                     0
r10             0x76fff000              1996484608
r11             0x0                     0
r12             0x7efff580              2130703744
sp              0x7efff508              0x7efff508
lr              0x76e6e718              1994843928
pc              0x10400                 0x10400 <loop+24>
cpsr            0x60000010              1610612752
fpscr           0x0                     0
(gdb) s
29              STR r0, [r1]    /*Load result into Fib*/
(gdb) s
30              BX  lr          /*End Program*/
(gdb) p(int)Fib
$1 = 8
(gdb)
```