

EMBEDDED PROGRAMMING LAB

LAB-4

DATE: 2-10-2024

PREETHISH K R

1. Write a program to find sum of all first 10 odd numbers.

Program:

```
AREA BASIC, CODE, READONLY
ENTRY
EXPORT __main
__main
    MOV R0, #1
    MOV R1, #0
    MOV R2, #10
NEXT ADD R1, R1, R0
    ADD R0, R0, #2
    SUB R2, #1
    CMP R2, #00
    BNE NEXT
    NOP
END
```

Output:

Register	Value
Core	
R0	0x00000000
R1	0x00000000
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x000000CC
xPSR	0x01000000
Banked	
System	
Internal	
Mode	Thread
Privilege	Privileged
Stack	MSP

Fig 1.1- Before execution

Register	Value
Core	
R0	0x00000015
R1	0x00000064
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000118
xPSR	0x61000000
Banked	
System	
Internal	
Mode	Thread
Privilege	Privileged
Stack	MSP
States	75

Fig 1.2- Result obtained on register R1

- Write a program to find the factorial of a given number

Program:

```

AREA BASIC, CODE, READONLY
ENTRY
EXPORT __main
__main
    MOV R0, #1
    MOV R1, #5
AGAIN MUL R0, R0, R1
    SUB R1, #1
    CMP R1, #00
    BNE AGAIN
    NOP
    END

```

Output:

Register	Value
Core	
R0	0x00000000
R1	0x00000000
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x000000CC
xPSR	0x01000000
Banked	
System	
Internal	
Mode	Thread
Privilege	Privileged
Stack	MSP

Fig 2.1- Before execution

Register	Value
Core	
R0	0x00000078
R1	0x00000001
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000112
xPSR	0x21000000
Banked	
System	
Internal	
Mode	Thread
Privilege	Privileged
Stack	MSP
States	28

Fig 2.2- Result obtained on register R0

- Write a program to count number of zeroes and number of ones in the given number.

Program:

```

        AREA BASIC, CODE, READONLY
        ENTRY
        EXPORT __main
__main
        LDR R0, =0X10000000

```

```

LDRB R1,[R0]
MOV R4,#8
MOV R3,#00
MOV R5,#00
AGAIN LSR R1,#1
ADDCS R3,#1
ADDCC R5,#1
SUB R4,#1
CMP R4,#00
BNE AGAIN
STR R3,[R0,#4]
STR R5,[R0,#8]
NOP
END

```

Output:

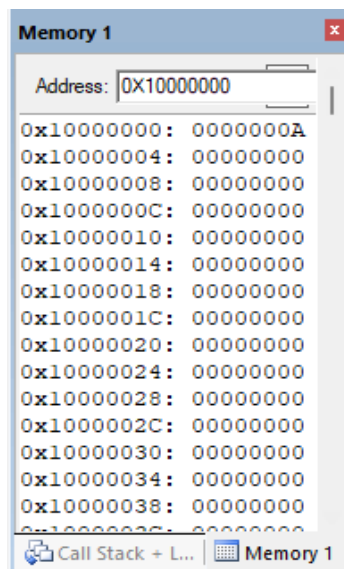


Fig 3.1- Data values entered

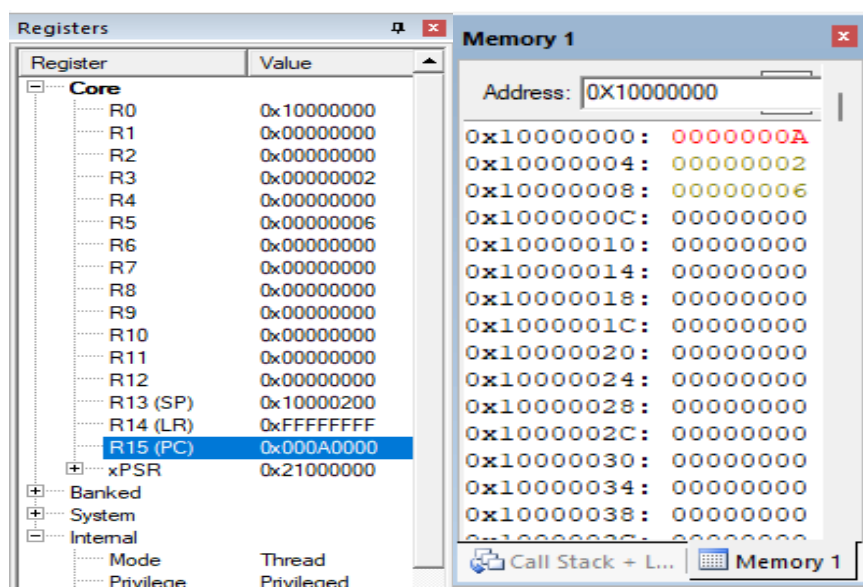


Fig 3.2- Result obtained

4. Write a program to compute the sum of 5 terms Arithmetic progression 1st term is 3 and common difference is 7

Program:

```

AREA BASIC, CODE, READONLY
ENTRY
EXPORT __main
__main
    MOV R0, #5
    MOV R1, #3
    AGAIN ADD R1, #7
    SUB R0, #1
    CMP R0, #00
    BNE AGAIN
    NOP
    END

```

Output:

Register	Value
R0	0x00000000
R1	0x00000000
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x000000CC
xPSR	0x01000000

Fig 4.1- Before execution

Register	Value
R0	0x00000000
R1	0x00000026
R2	0x00000000
R3	0x00000000
R4	0x00000000
R5	0x00000000
R6	0x00000000
R7	0x00000000
R8	0x00000000
R9	0x00000000
R10	0x00000000
R11	0x00000000
R12	0x00000000
R13 (SP)	0x10000200
R14 (LR)	0xFFFFFFFF
R15 (PC)	0x00000112
xPSR	0x61000000

Fig 4.2- Result obtained in R1 register