Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2022-23

Date:

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Week#____1_____ Program Number: ____1___

Title of the Program

Write an ALP using ARM instruction set to check if a number stored in a register is even or odd. If even, store 00 in R0, else store FF in R0

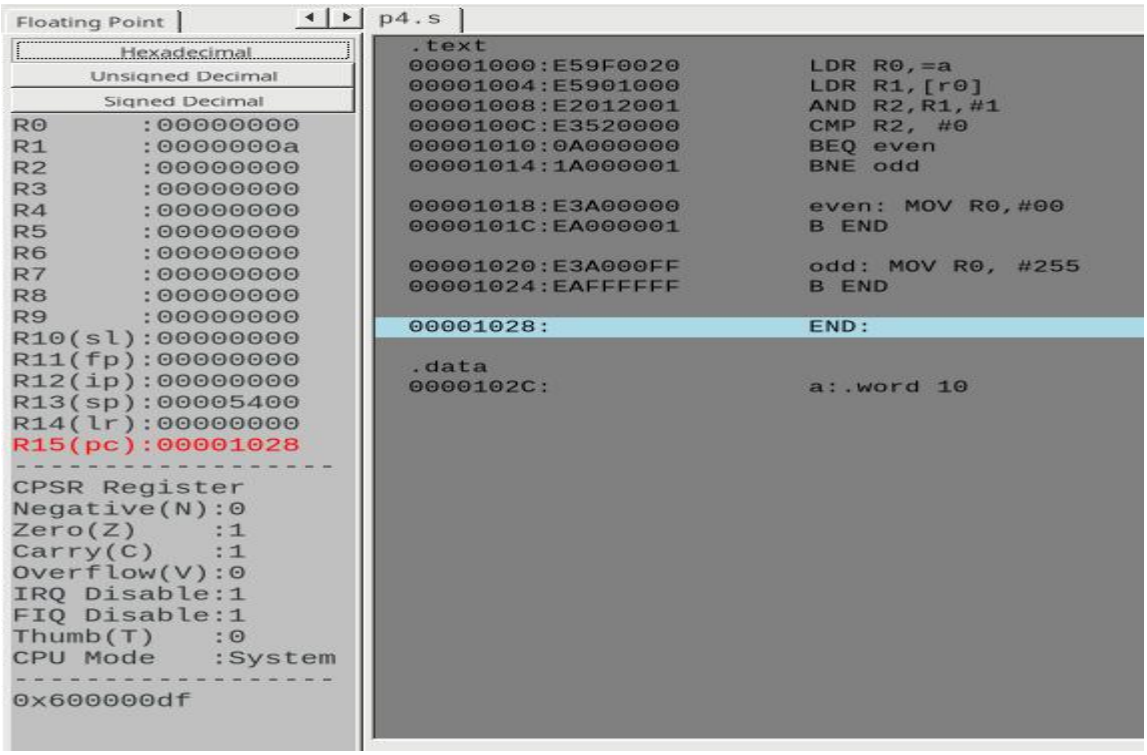
I. Code:

```
.text
   LDR R0,=a
   LDR R1,[r0]
   AND R2,R1,#1
   CMP R2, #0
   BEQ even
   BNE odd

   even: MOV R0,#00
```

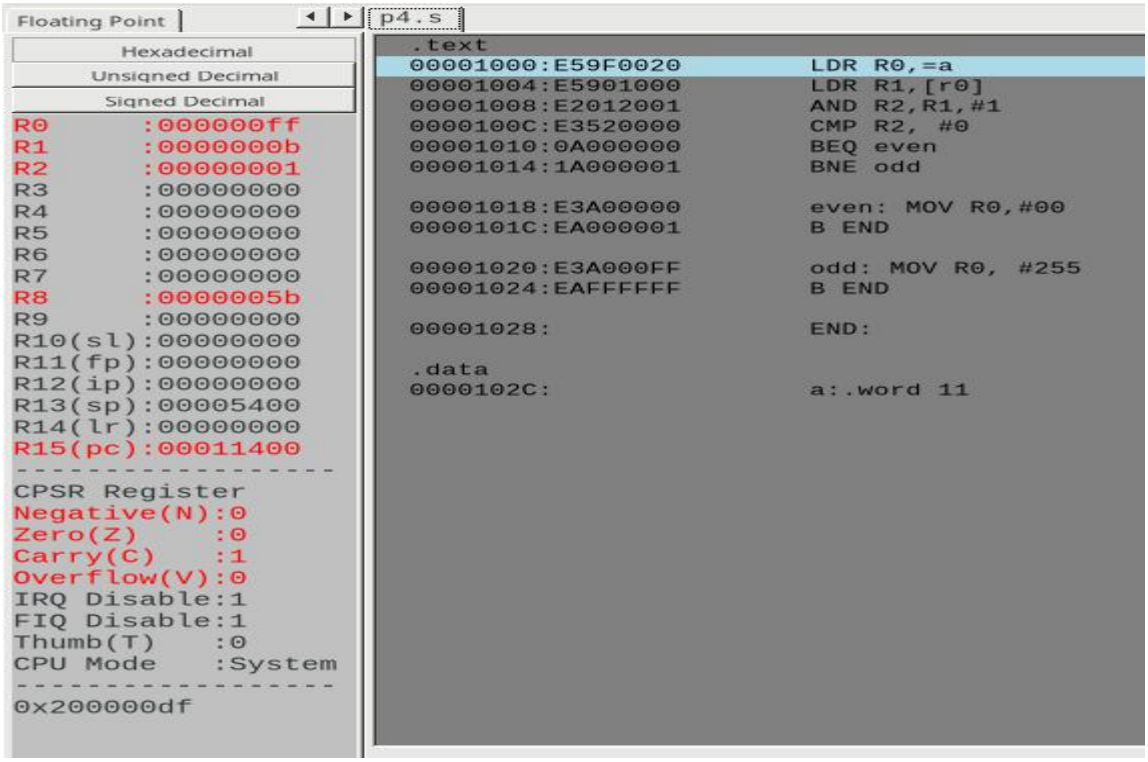
```
    B END

    odd: MOV R0, #255
    B END

    END:

.data
    a:.word 10
```

II. Screen Shot:

a) when number is even



b) when number is odd



III. Output Table:

Input	Output
R1=10	R0=00
R1=11	R0=ff (255)

Week#____1_____ Program Number: ____2___

Title of the Program

Write an ALP to compare the value of R0 and R1, add if R0 = R1, else subtract

I. ARM Assembly Code:

```
.text
   LDR R0,=a
   LDR R1,=b
   LDR R2,=c
   LDR R3,[r0]
   LDR R4,[r1]
   CMP R3,R4
   beq add
   sub r5,r3,R4
   STR r5,[r2]
   B END
   add:
   add r5,r3,R4
   STR r5,[r2]
   END:
```

.data

a:.word 10

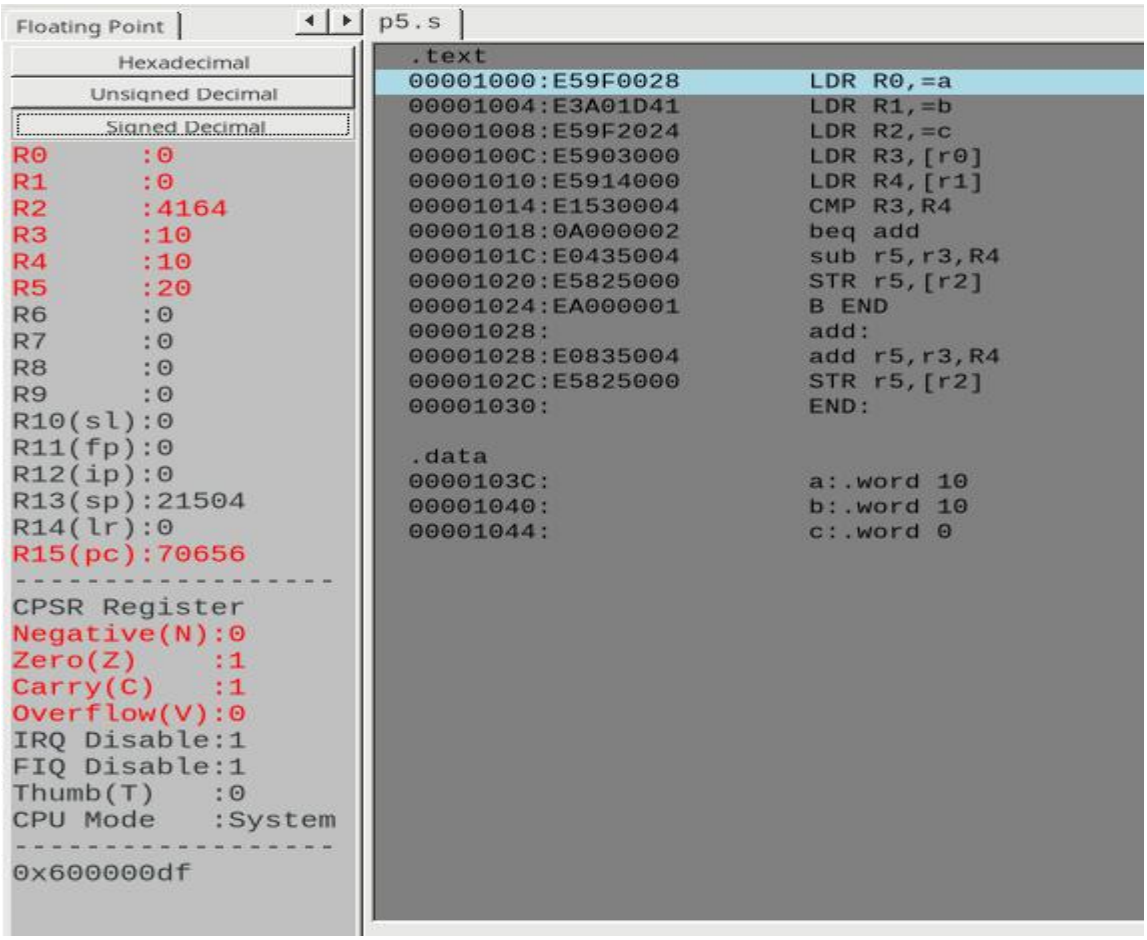
b:.word 6

c:.word 0

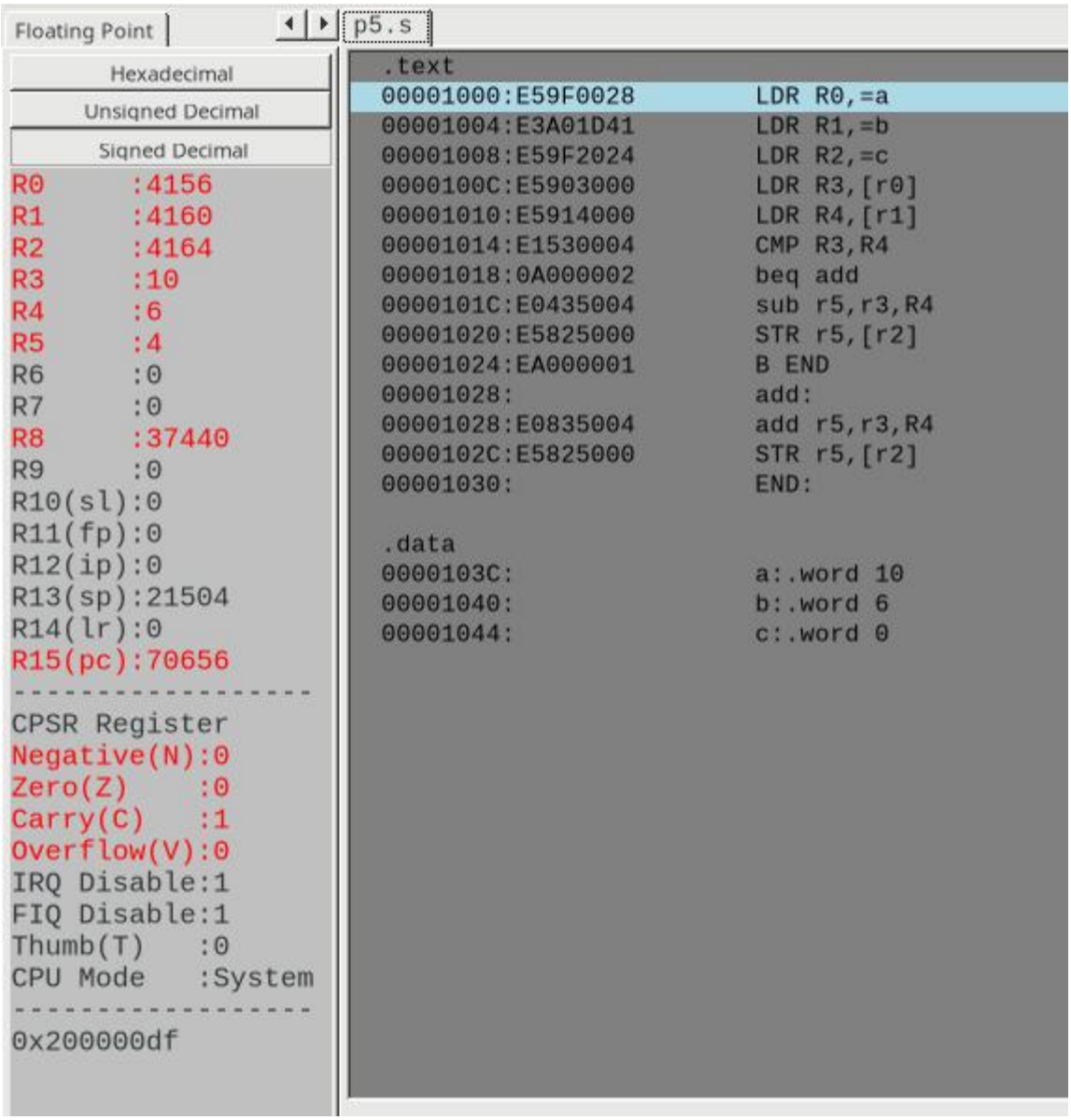
II. Output Screen Shot (Two)

The output should be verified for both equal and nor equal values

a. when r0 and r1 are equal:



b. when r0 and r1 are not equal:



III.Output Table:

Input	Output
R3=10, R4=10	R5=20
R3=10, R4=6	R5=4

Week#____1_____ Program Number: ____3___

Title of the Program

Based on the value of the number in R0, Write an ALP to store 1 in R1 if R0 is zero, Store 2 in R1 if R0 is positive, Store 3 in R1 if R0 is negative. (Program shown in class)

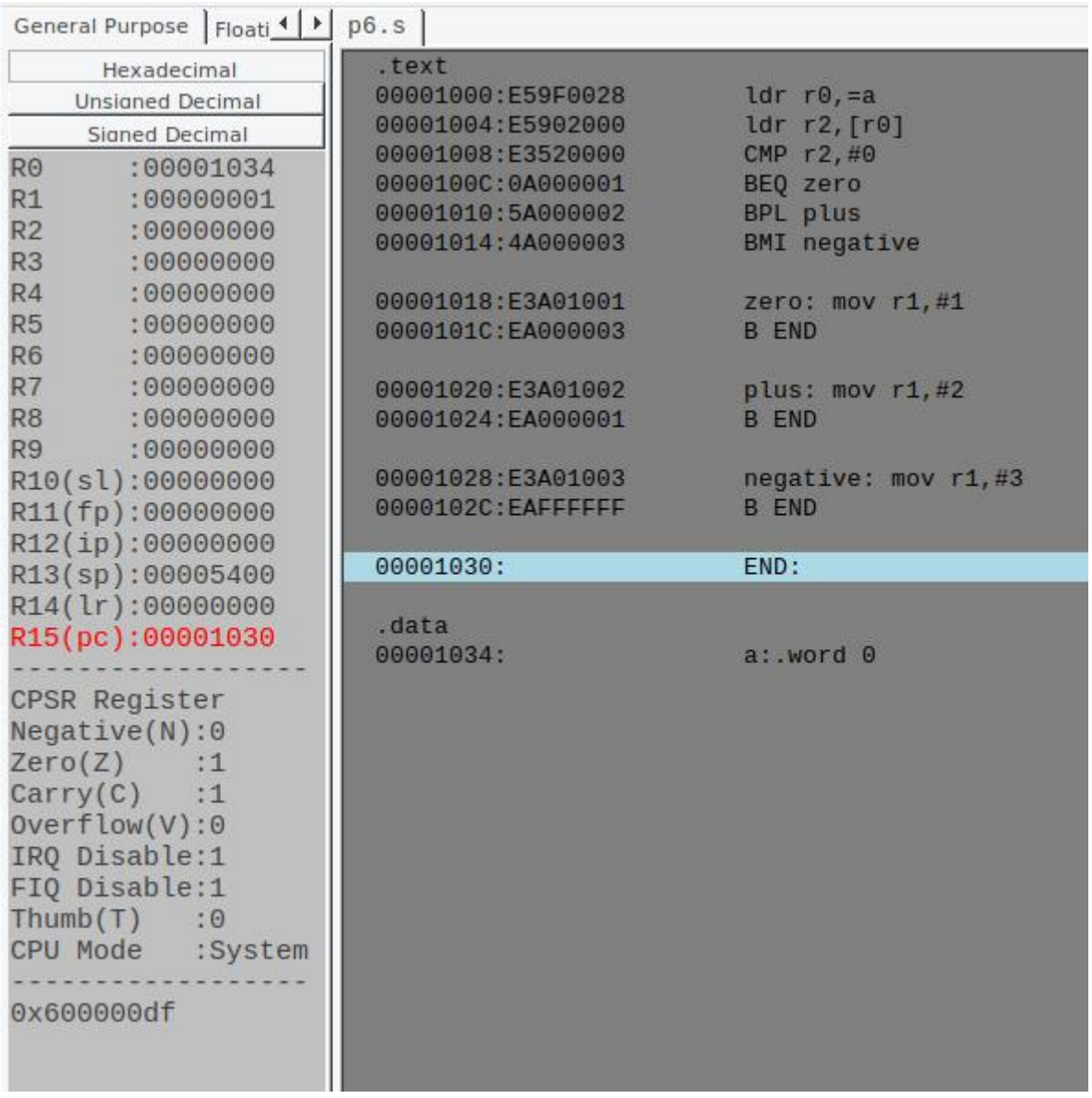
I. ARM Assembly Code:

```
.text
   ldr r0,=a
   ldr r2,[r0]
   CMP r2,#0
   BEQ zero
   BPL plus
   BMI negative
   zero: mov r1,#1
   B END
   plus: mov r1,#2
   B END
   negative: mov r1,#3
   B END
   END:
.data
   a:.word 0
```

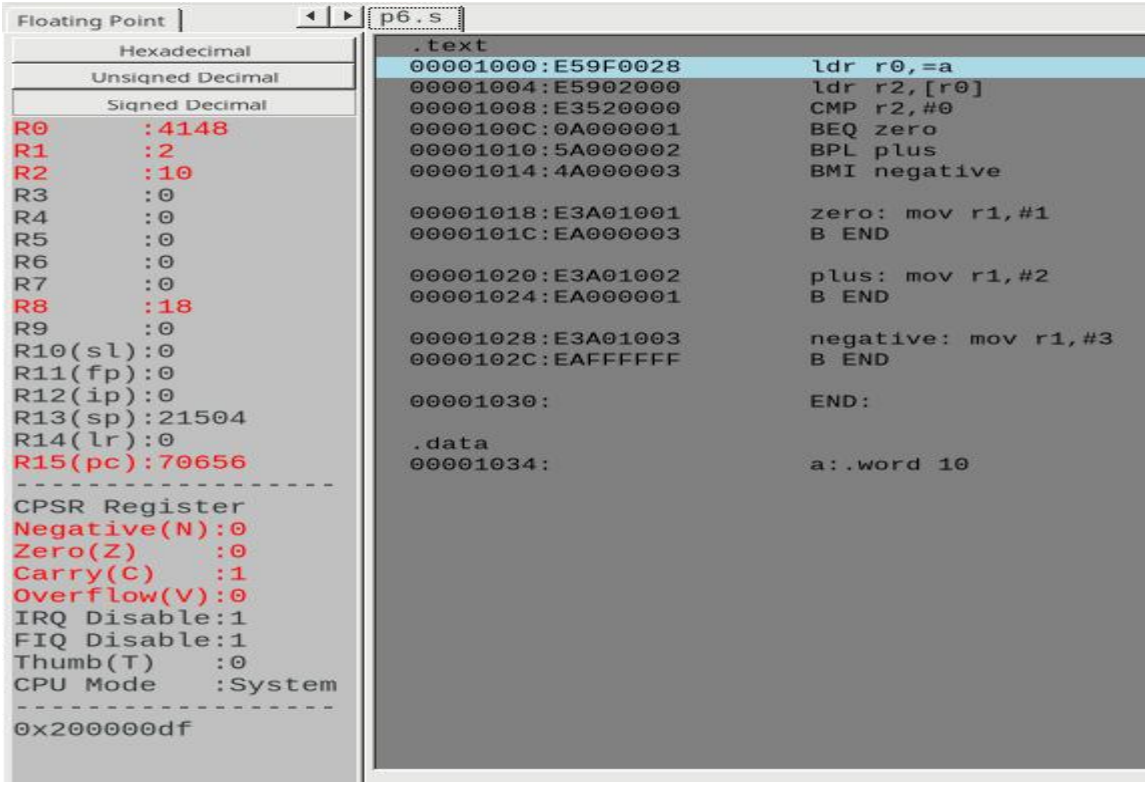
II. Output Screen Shot (Three)

The output should be verified for zero, positive and negative cases.

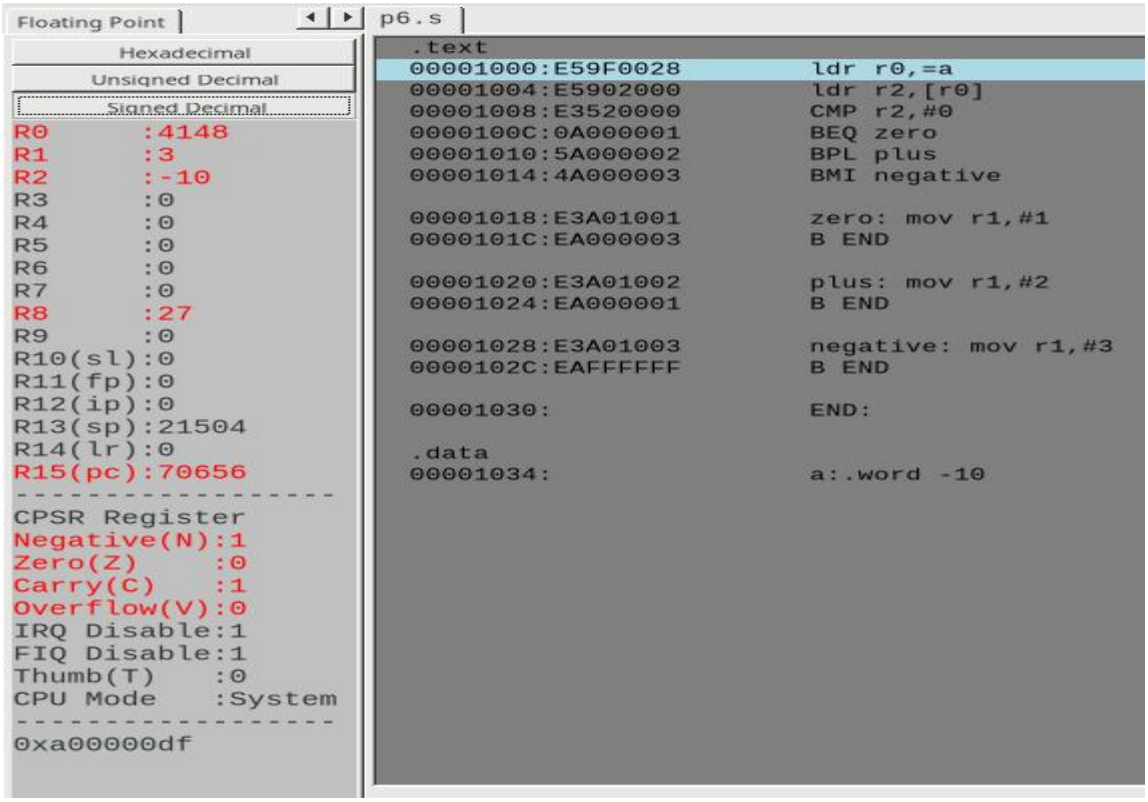
a. when the number is 0:



b. when number is positive:



c. when number is negative:



III.Output Table

Input	Output
R0=0	R1=1
R0=10	R1=2
R0=-10	R1=3

Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

Signature:
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