PES UNIVERSITY

Department of Computer Science & Engineering

Microprocessor & Computer Architecture - UE20CS252

NAME : VISHWAS M

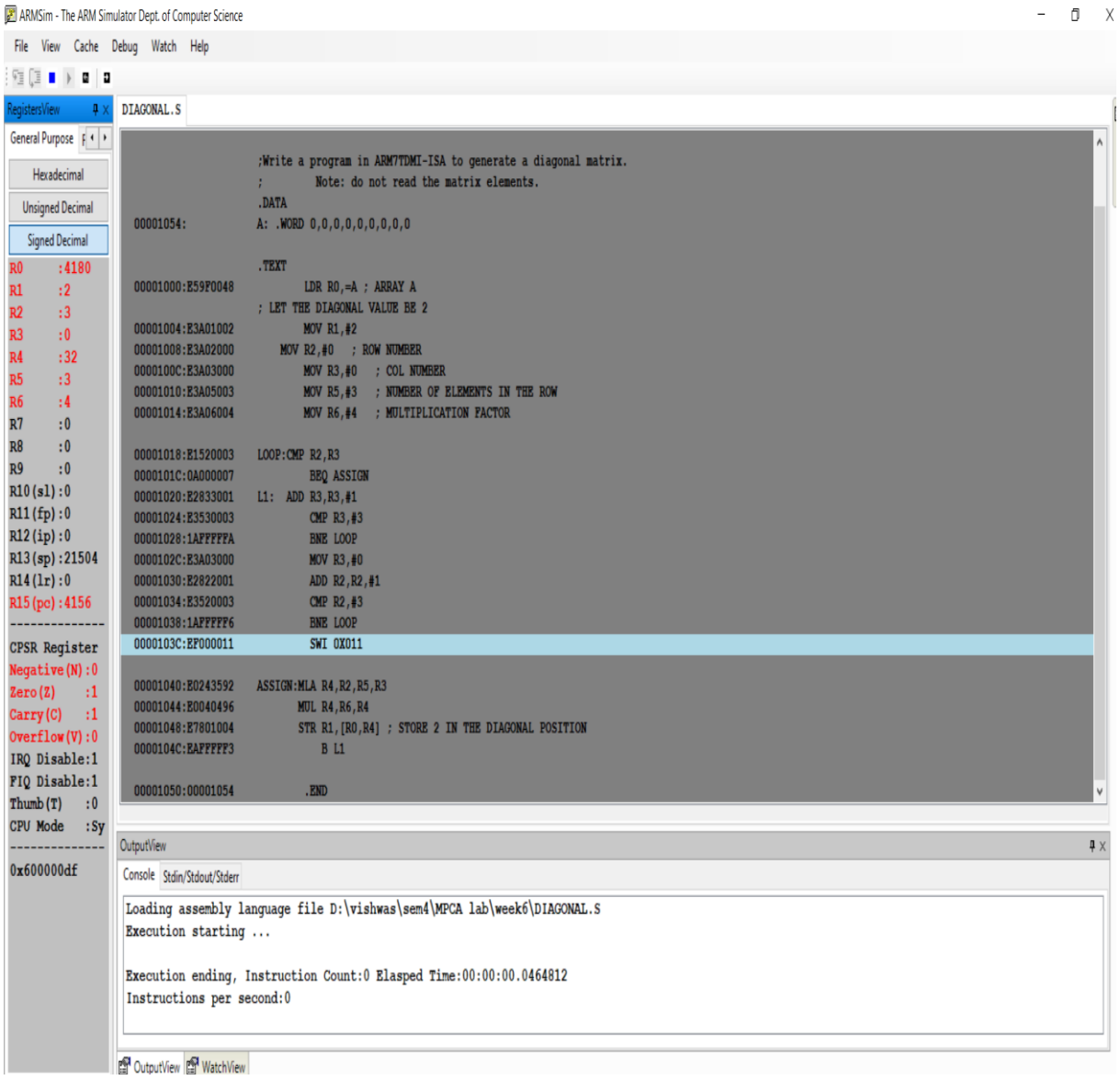
SEC : F

SRN : PES2UG20CS390

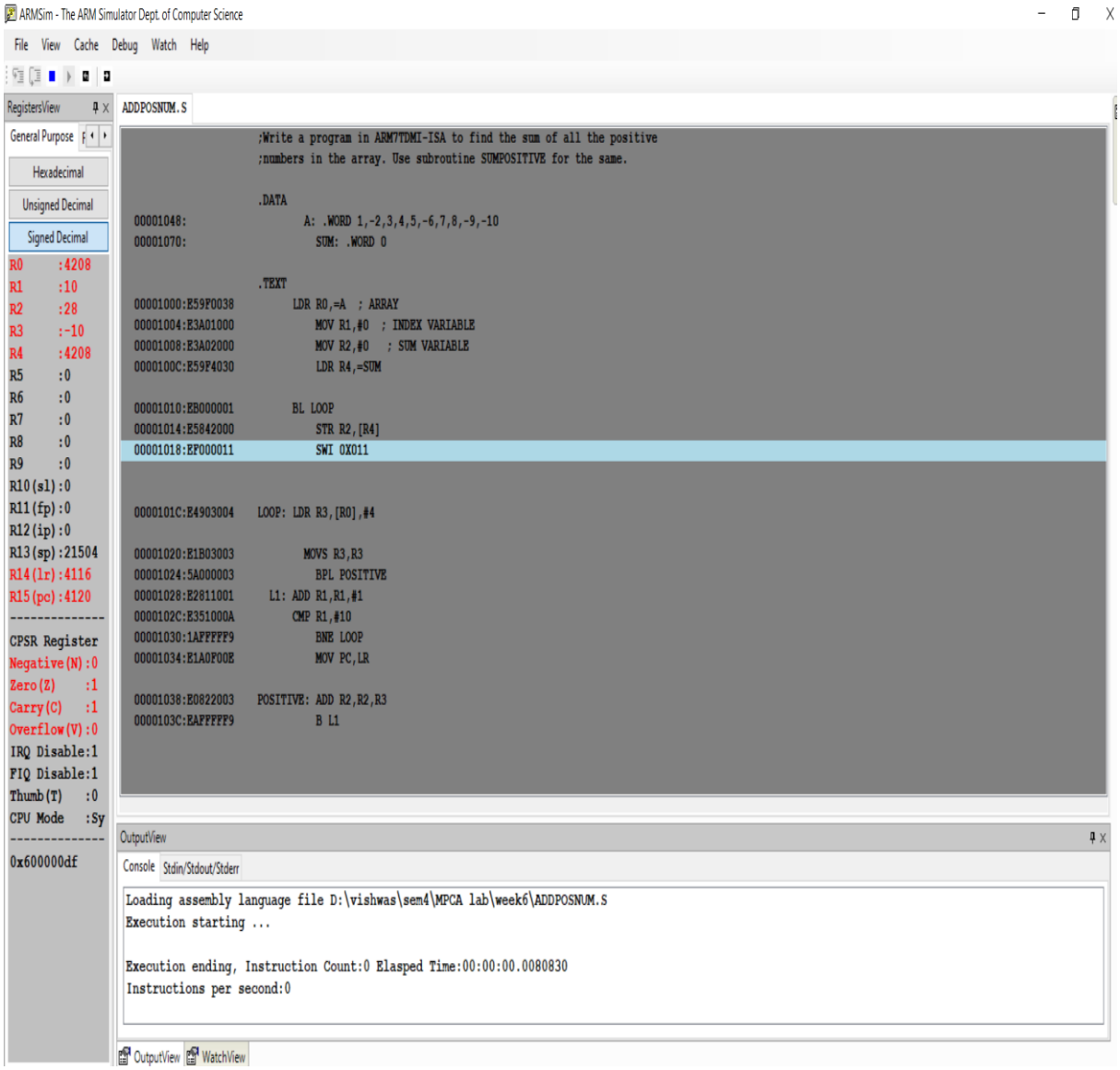
DATE: 26/03/2022

WEEK 6

Sl. No	Programs
Week No.6	1. Write a program in ARM7TDMI-ISA to generate a diagonal matrix. Note: do not read the matrix elements.

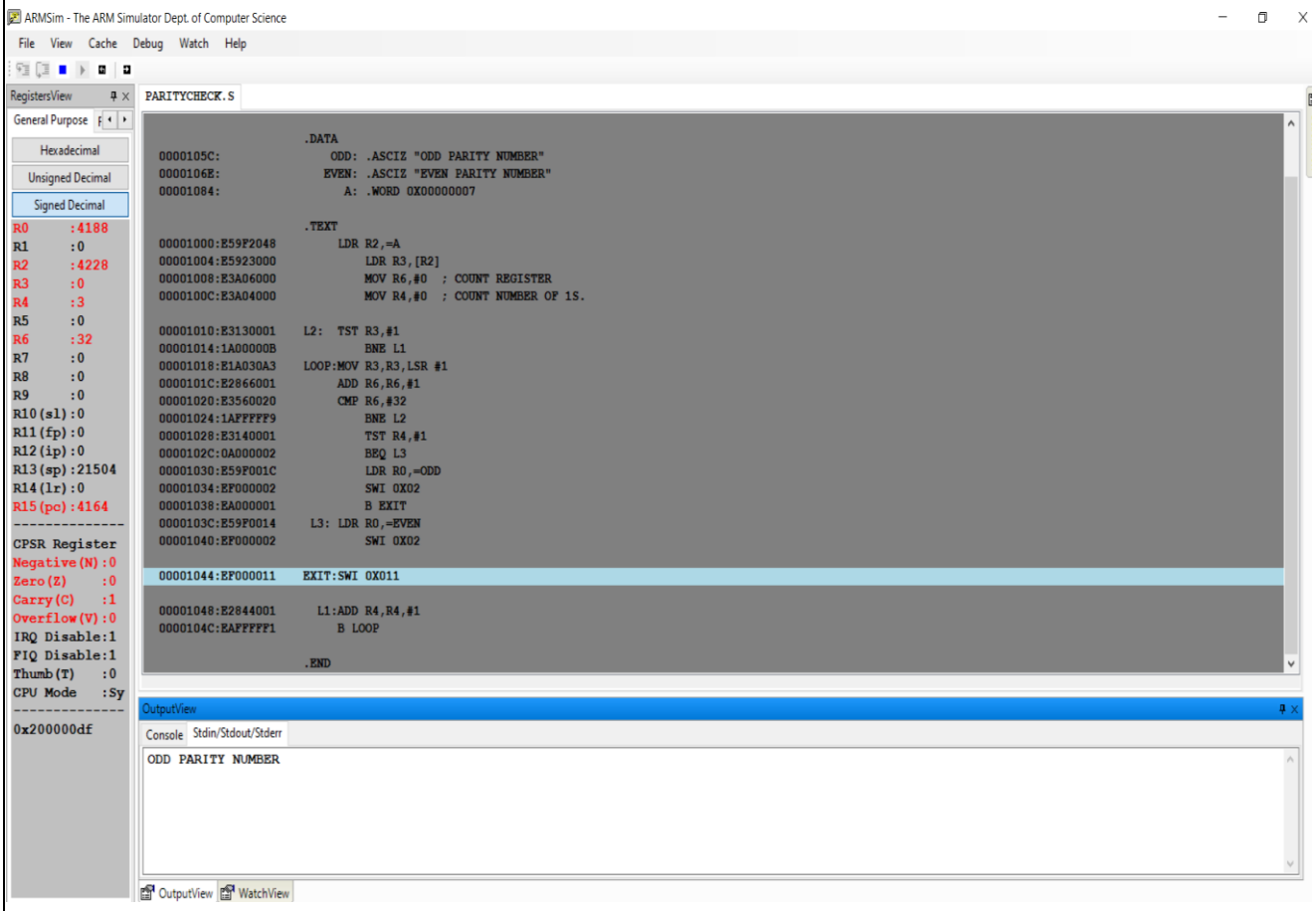


2. Write a program in ARM7TDMI-ISA to find the sum of all the positive numbers in the array. Use subroutine SUMPOSITIVE for the same.

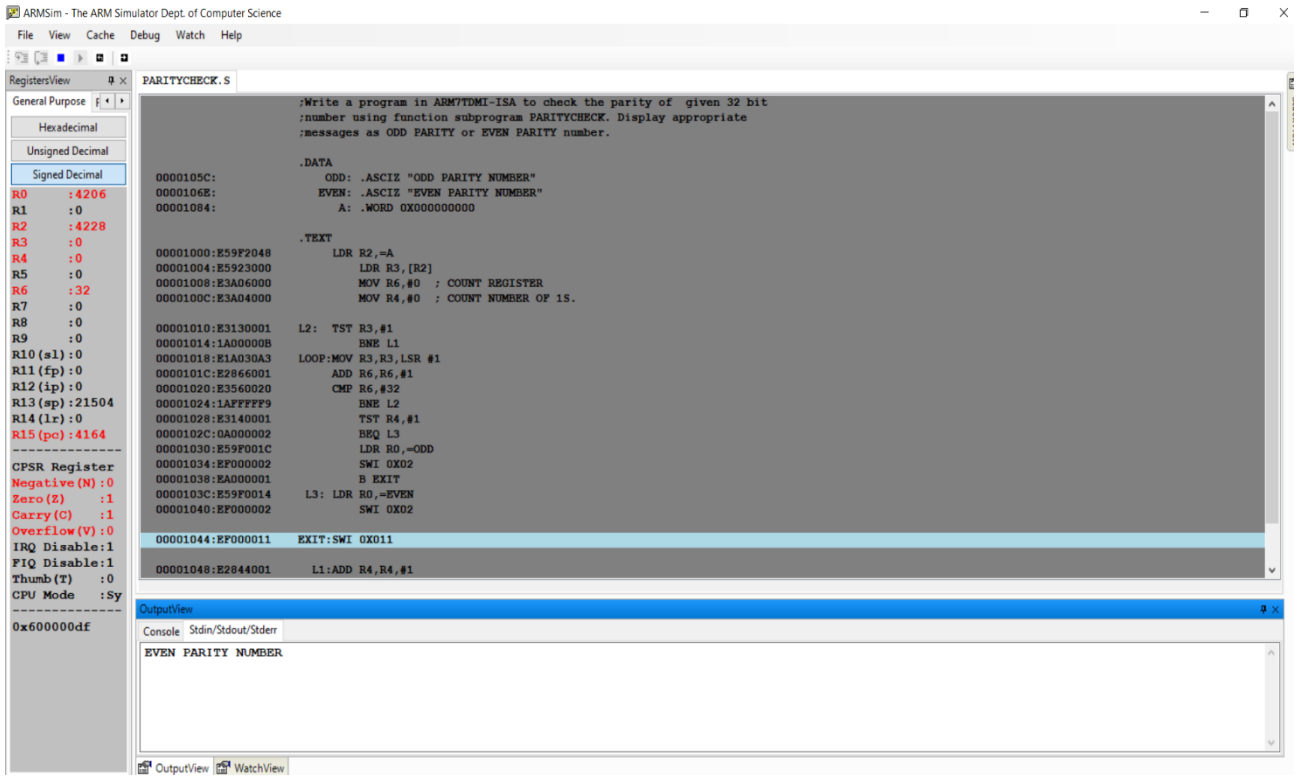


3. Write a program in ARM7TDMI-ISA to check the parity of given 32 bit number using function subprogram PARITYCHECK. Display appropriate messages as ODD PARITY or EVEN PARITY number.

a)for odd parity:



b)for even parity:



Student exercises:

1. Write a program in ARM7TDMI-ISA to find the sum of all the digits in an 32bit number.

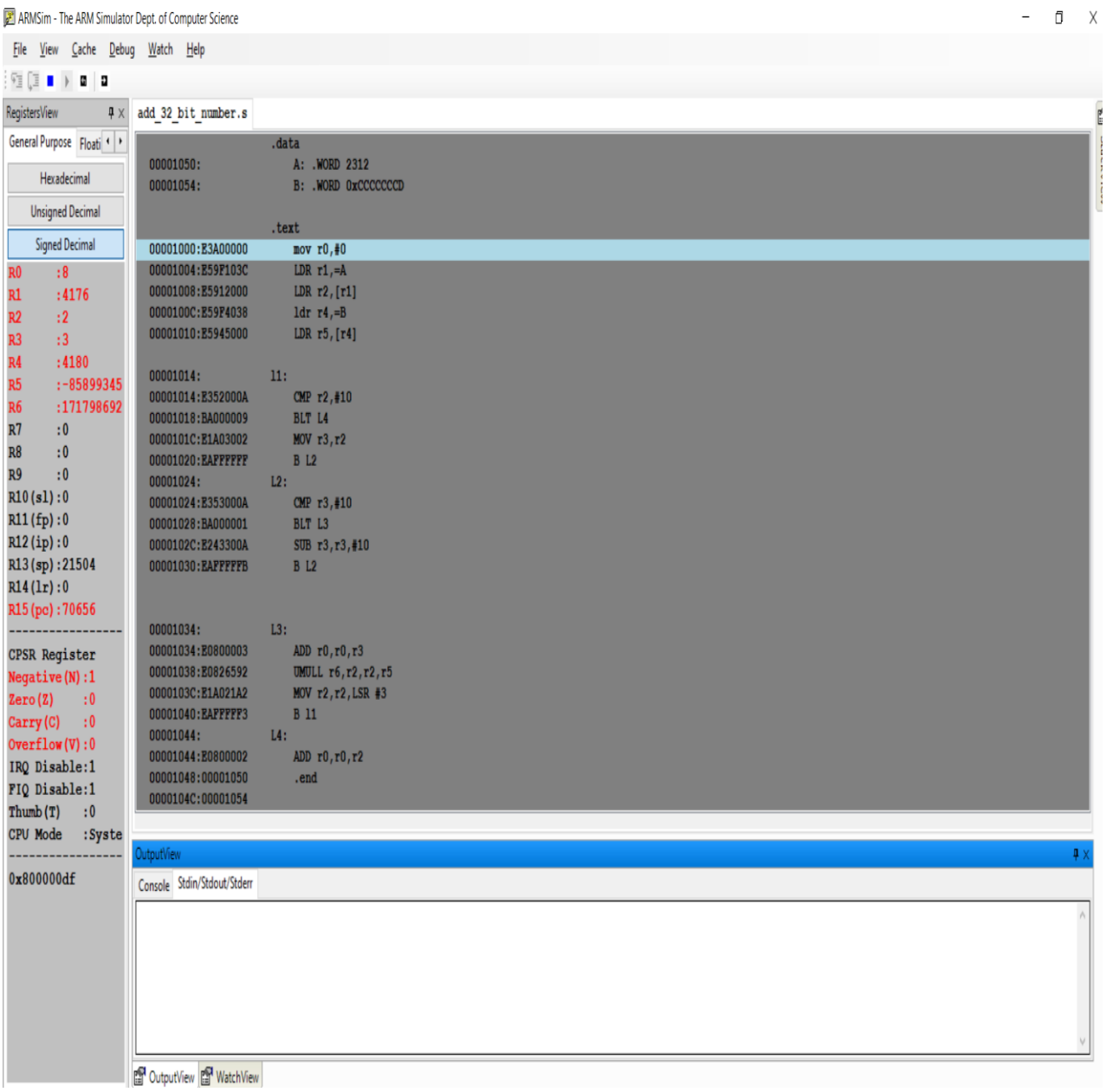
```
.data
   A: .WORD 2312
   B: .WORD 0xCCCCCCCD

.text
   mov r0,#0
   LDR r1,=A
   LDR r2,[r1]
   ldr r4,=B
   LDR r5,[r4]

l1:
   CMP r2,#10
   BLT L4
   MOV r3,r2
   B L2
L2:
   CMP r3,#10
   BLT L3
   SUB r3,r3,#10
   B L2


L3:
   ADD r0,r0,r3
   UMULL r6,r2,r2,r5
   MOV r2,r2,LSR #3
   B l1
L4:
   ADD r0,r0,r2
   .end
```

//SUM IS STORED IN R0



2. Write a program in ARM7TDMI-ISA to find the number of occurrences of a given character in a string.

Example: Given string : My name is Bond.

Character : ‘n’.

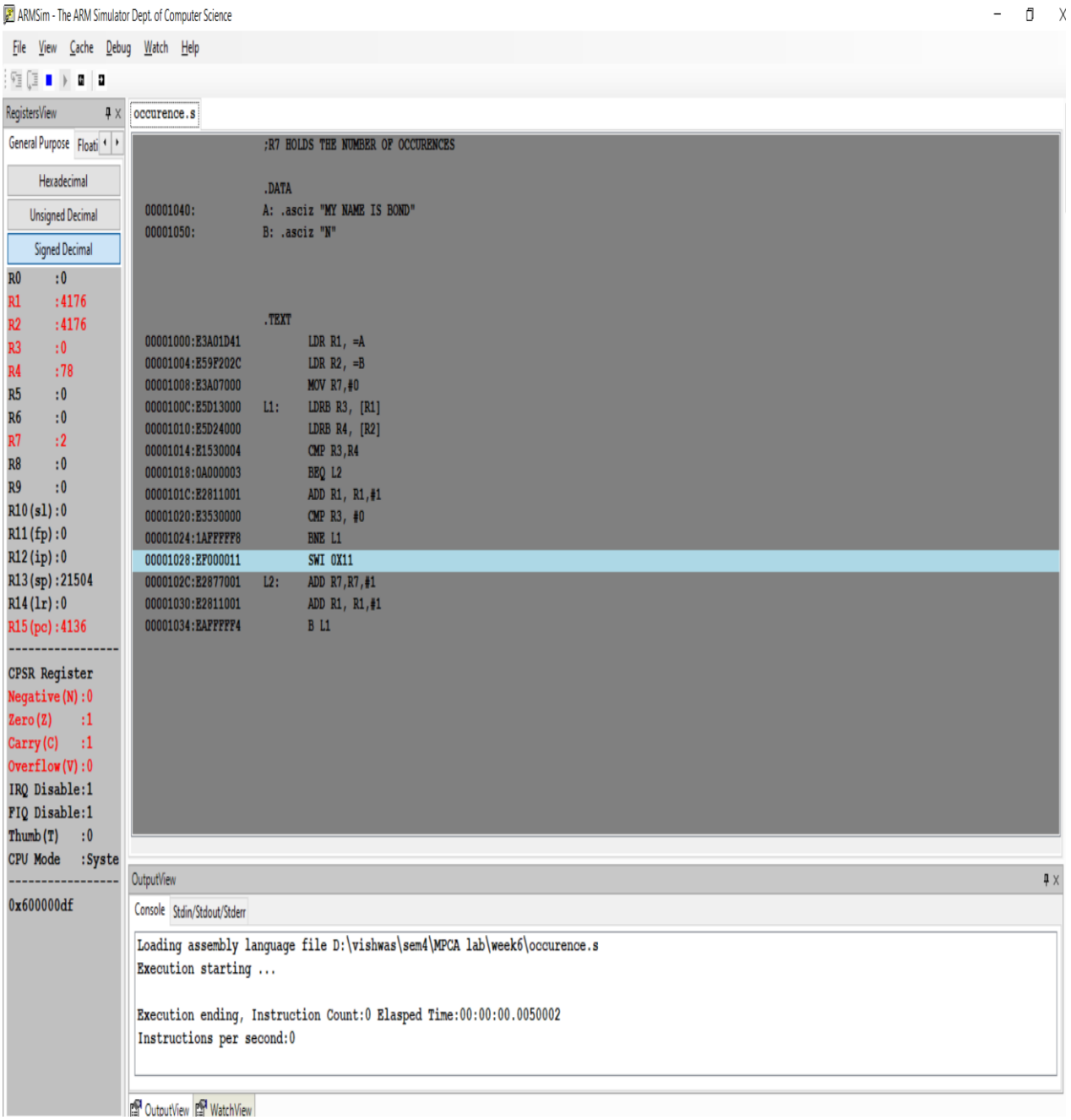
Expected Output : Display 2 in a register.

```
;R7 HOLDS THE NUMBER OF OCCURENCES

.DATA
A: .asciz "MY NAME IS BOND"
B: .asciz "N"



.TEXT
        LDR R1, =A
        LDR R2, =B
      MOV R7,#0
L1:     LDRB R3, [R1]
        LDRB R4, [R2]
      CMP R3,R4
      BEQ L2
      ADD R1, R1,#1
        CMP R3, #0
        BNE L1
      SWI 0X11
L2:    ADD R7,R7,#1
      ADD R1, R1,#1
      B L1
```



- Step 1: Get number by user
- Step 2: Get the modulus/remainder of the number
- Step 3: sum the remainder of the number
- Step 4: Divide the number by 10
- Step 5: Repeat the step 2 while number is greater than 0.

```
udiv    r0, r6, r7      @ no, div to get quotient
```

```
operand1 MOD operand2
```

MPCA-Laboratory/Assignment/Hands-on/Project