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ENROLLMENT NO.- 200280111051

BATCH- A2, 5TH SEM

EXERCISE 3

QUESTION 1

1. Give the register value for each of the following instructions after it is executed. Assume R0=0x4545, R1=0x5454 and R2=0xFF00.

a) AND R3, R2, R0

b) AND R3, R2, R2

c) AND R3, R0, #0xFF

d) ORR R3, R0, #0x0F

e) ORR R3, R2, R1

f) EOR R0, R0, #0x45

g) EOR R0, R0, R0

CODE:

```
AREA PROG,CODE,READONLY
ENTRY
LDR R0,=0X4545
LDR R1,=0X5454
LDR R2,=0XFF00
AND R3,R2,R0
AND R4,R2,R2
AND R5,R0,#0XFF
ORR R6,R0,#0X0F
ORR R7,R2,R1
EOR R8,R0,#0X45
EOR R9,R0,R0
END
```

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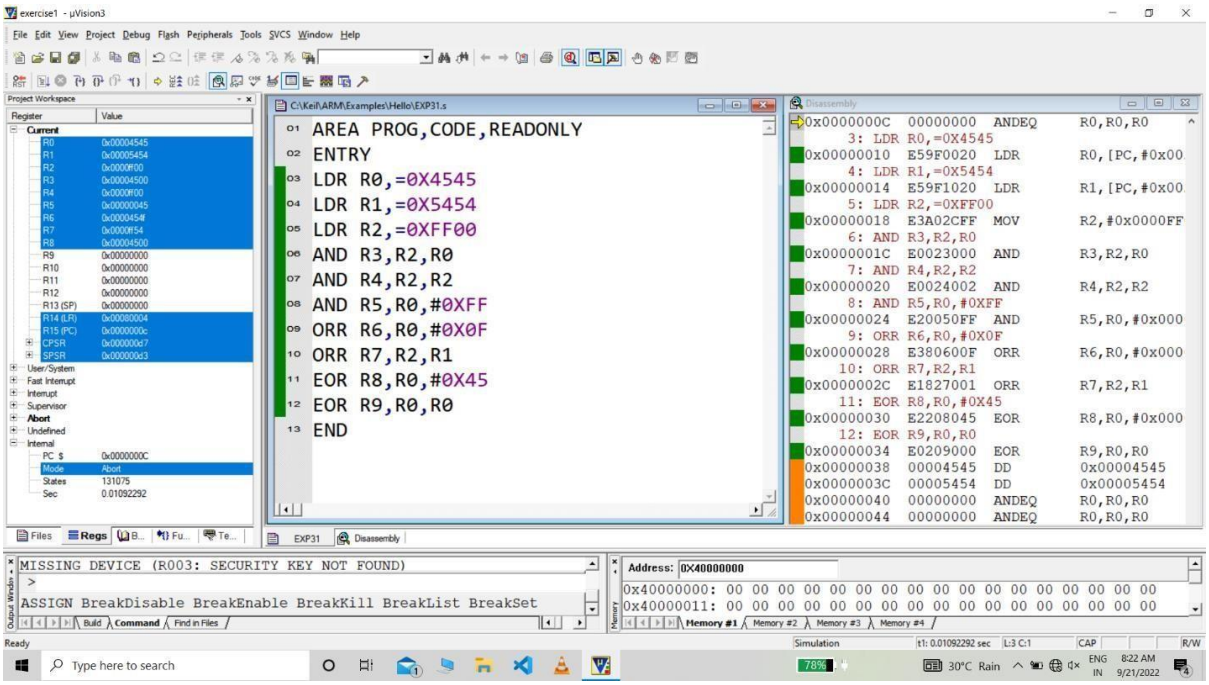
OUTPUT:



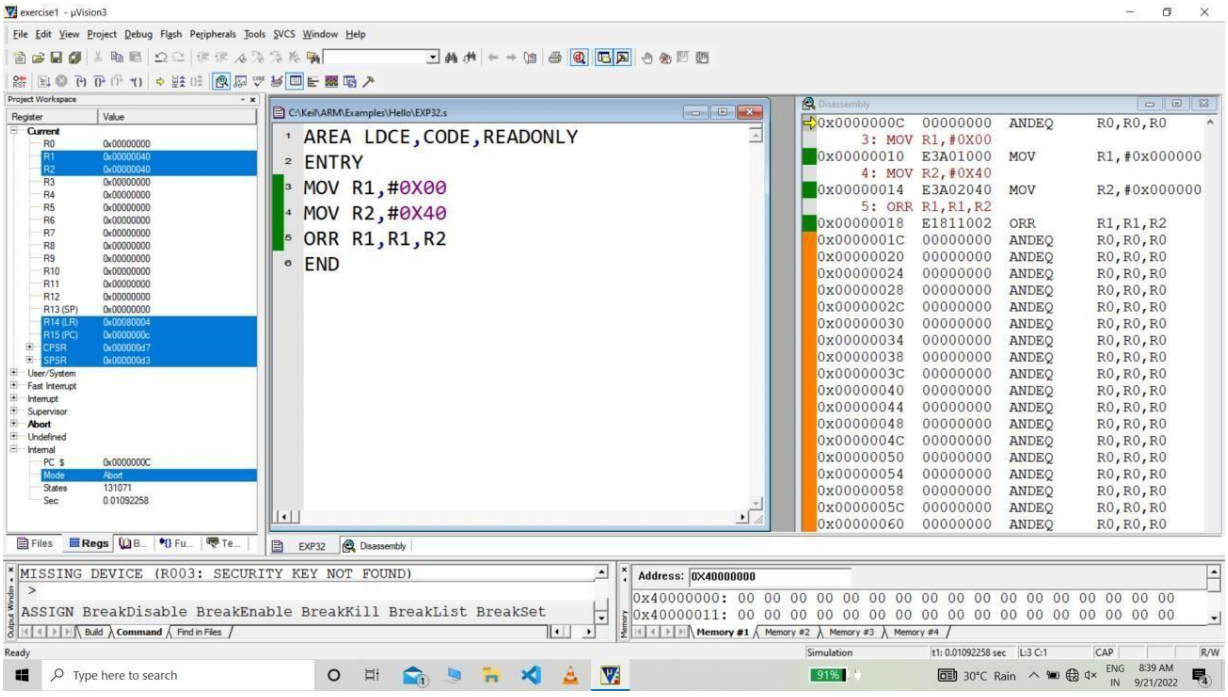
QUESTION 2

Write an instruction that sets bit 6 of R1 without affecting other bits.

CODE:

```
AREA LDCE,CODE,READONLY

ENTRY

MOV R1,#0X00

MOV R2,#0X40

ORR R1,R1,R2

END
```

OUTPUT:



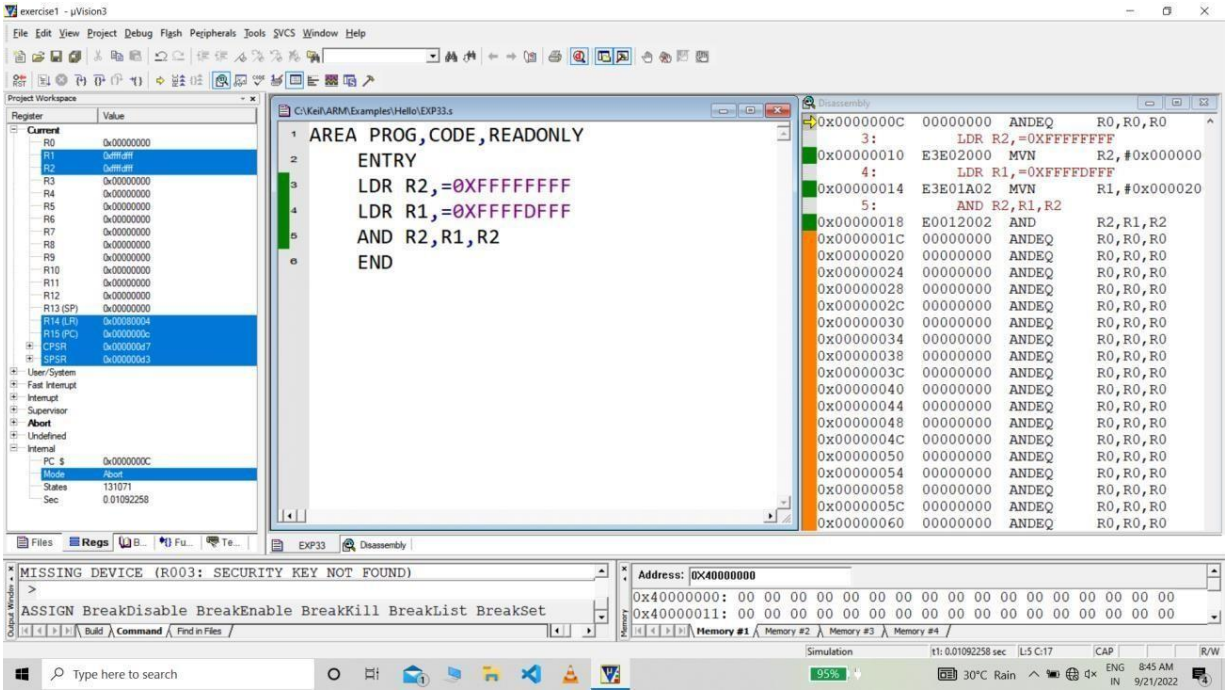
QUESTION 3

Write an instruction that clear bit 13 of R2 without affecting other bits.

CODE:

```
AREA PROG,CODE,READONLY
        ENTRY
        LDR  R2,=0XFFFFFFFF
        LDR R1,=0XFFFFDFFF
        AND R2,R1,R2
        END
```

OUTPUT:



QUESTION 4

Write a program to multiply the following values. (R1=0x5578, R2=0xaaa, R3=0xaabb987f, R4=0x12345678).

a) Multiply R1 and R2

b) Multiply R1 and R3

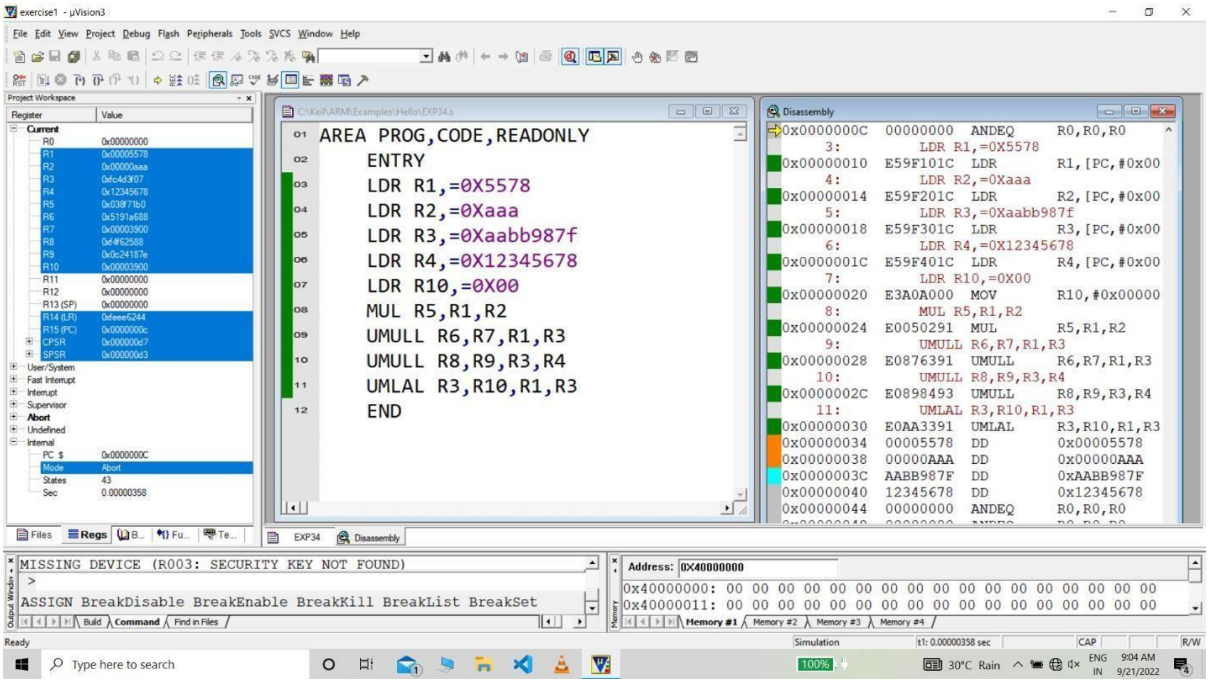
c) Multiply R3 and R4

d) Perform (R1 * R3 + R3)

CODE:

```
AREA PROG,CODE,READONLY
        ENTRY
        LDR R1,=0X5578
        LDR R2,=0Xaaa
        LDR R3,=0Xaabb987f
        LDR R4,=0X12345678
        LDR R10,=0X00
        MUL R5,R1,R2
        UMULL R6,R7,R1,R3
        UMULL R8,R9,R3,R4
        UMLAL R3,R10,R1,R3
        END
```

OUTPUT:


exercise1 - µVision3
File Edit View Project Debug Flash Peripherals Tools SVCS Window Help
Project Workspace
Register
Value
Current
R0 0x00000000
R1 0x00005578
R2 0x00000aaa
R3 0xfc4d3f07
R4 0x12345678
R5 0x03877b0
R6 0x5191a688
R7 0x00003900
R8 0xf4f62588
R9 0x0c24187e
R10 0x00003900
R11 0x00000000
R12 0x00000000
R13 (SP) 0x00000000
R14 (LR) 0xfeee6244
R15 (PC) 0x0000000c
CPSR 0x000000d7
SPSR 0x000000d3
User/System
Fast Interrupt
Interrupt
Supervisor
Abort
Undefined
Internal
PC $ 0x0000000C
Mode Abort
States 43
Sec 0.00000358
Files
Regs
B...
Fu...
Te...
C:\Keil\ARM\Examples\Hello\EXP34.s
01 AREA PROG,CODE,READONLY
02 ENTRY
03 LDR R1,=0X5578
04 LDR R2,=0Xaaa
05 LDR R3,=0Xaabb987f
06 LDR R4,=0X12345678
07 LDR R10,=0X00
08 MUL R5,R1,R2
09 UMULL R6,R7,R1,R3
10 UMULL R8,R9,R3,R4
11 UMLAL R3,R10,R1,R3
12 END
EXP34
Disassembly
Disassembly
0x0000000C 00000000 ANDEQ R0,R0,R0
3: LDR R1,=0X5578
0x00000010 E59F101C LDR R1,[PC,#0x00
4: LDR R2,=0Xaaa
0x00000014 E59F201C LDR R2,[PC,#0x00
5: LDR R3,=0Xaabb987f
0x00000018 E59F301C LDR R3,[PC,#0x00
6: LDR R4,=0X12345678
0x0000001C E59F401C LDR R4,[PC,#0x00
7: LDR R10,=0X00
0x00000020 E3A0A000 MOV R10,#0x00000
8: MUL R5,R1,R2
0x00000024 E0050291 MUL R5,R1,R2
9: UMULL R6,R7,R1,R3
0x00000028 E0876391 UMULL R6,R7,R1,R3
10: UMULL R8,R9,R3,R4
0x0000002C E0898493 UMULL R8,R9,R3,R4
11: UMLAL R3,R10,R1,R3
0x00000030 E0AA3391 UMLAL R3,R10,R1,R3
0x00000034 00005578 DD 0x00005578
0x00000038 00000AAA DD 0x00000AAA
0x0000003C AABB987F DD 0xAABB987F
0x00000040 12345678 DD 0x12345678
0x00000044 00000000 ANDEQ R0,R0,R0
MISSING DEVICE (R003: SECURITY KEY NOT FOUND)
>
ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet
Build
Command
Find in Files
Address: 0X40000000
0x40000000: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x40000011: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Memory #1
Memory #2
Memory #3
Memory #4
Ready
Simulation
t1: 0.00000358 sec
CAP
R/W
Type here to search
100%
30°C Rain
ENG
IN
9:04 AM
9/21/2022

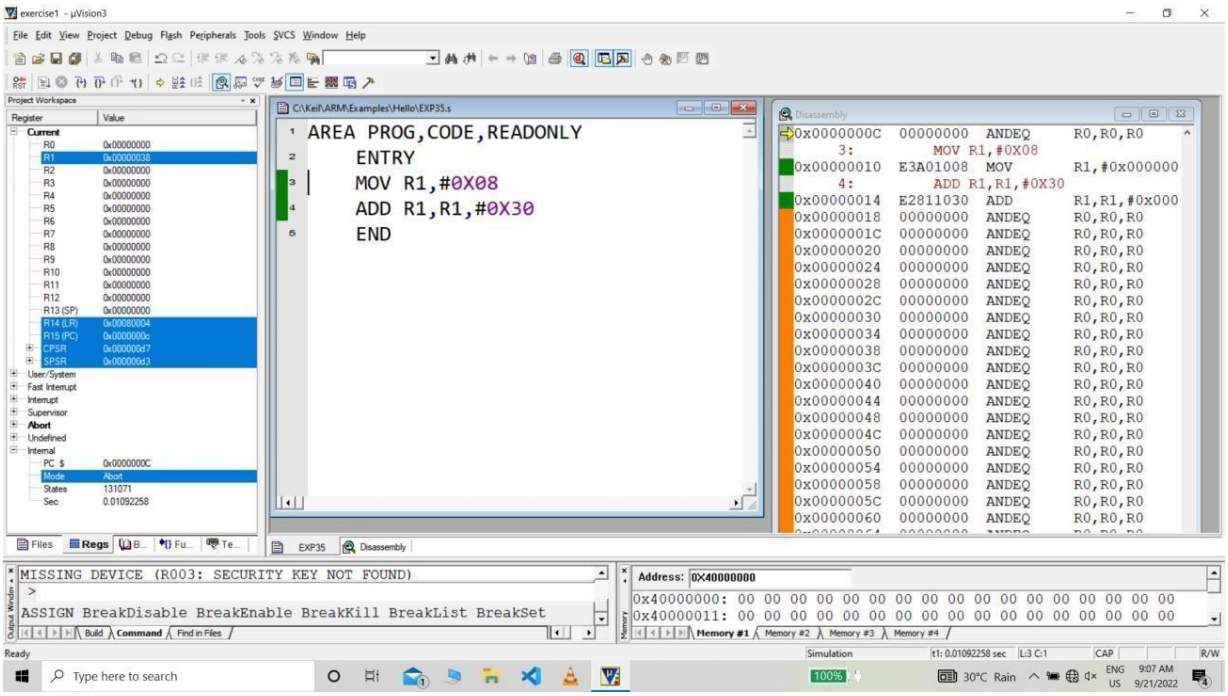
QUESTION 5

Write a program to convert unpacked BCD number into ASCII number.

CODE:

```
AREA PROG,CODE,READONLY
        ENTRY
        MOV R1,#0X08
        ADD R1,R1,#0X30
        END
```

OUTPUT:



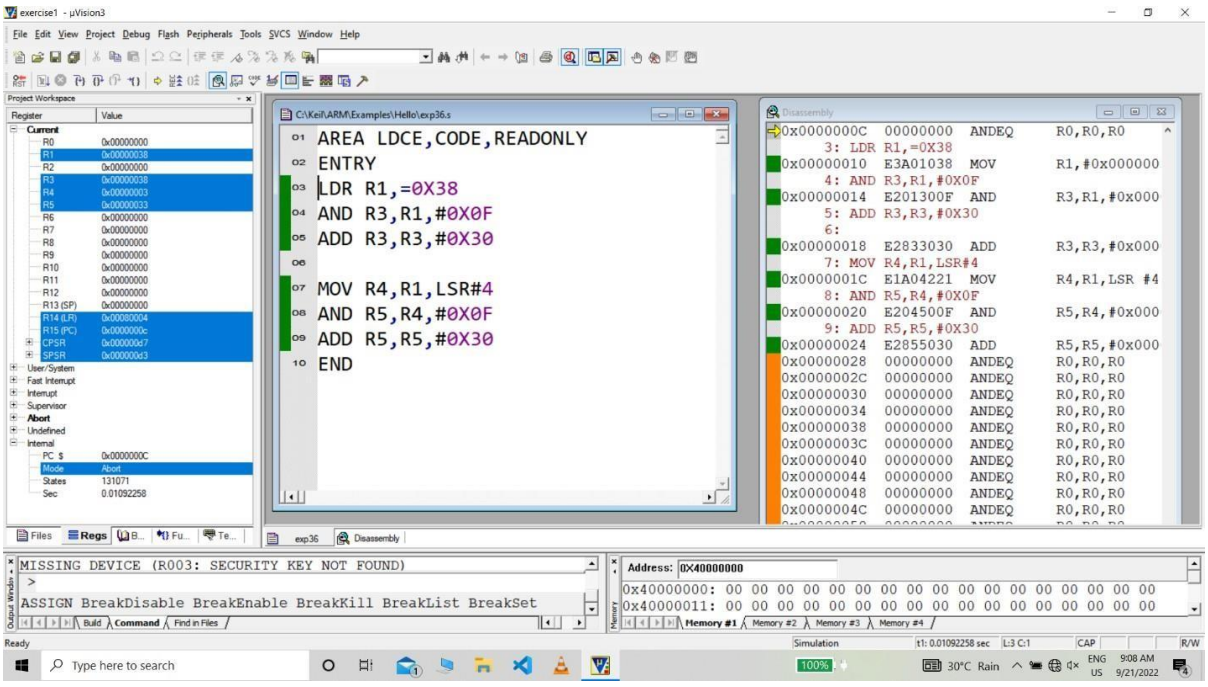
QUESTION 6

Write a program to convert packed BCD number into ASCII number.

CODE:

```
AREA LDCE,CODE,READONLY
ENTRY
LDR R1,=0X38
AND R3,R1,#0X0F
ADD R3,R3,#0X30
MOV R4,R1,LSR#4
AND R5,R4,#0X0F
ADD R5,R5,#0X30
END
```

OUTPUT:



QUESTION 7

Write a program to convert ASCII number into packed BCD number.

CODE:

```
AREA PROG,CODE,READONLY
ENTRY
MOV R1,#0X36
MOV R2,#0X38
SUB R3,R1,#0X30
SUB R4,R2,#0X30
ADD R5,R4,R3,LSL #4
END
```

OUTPUT: