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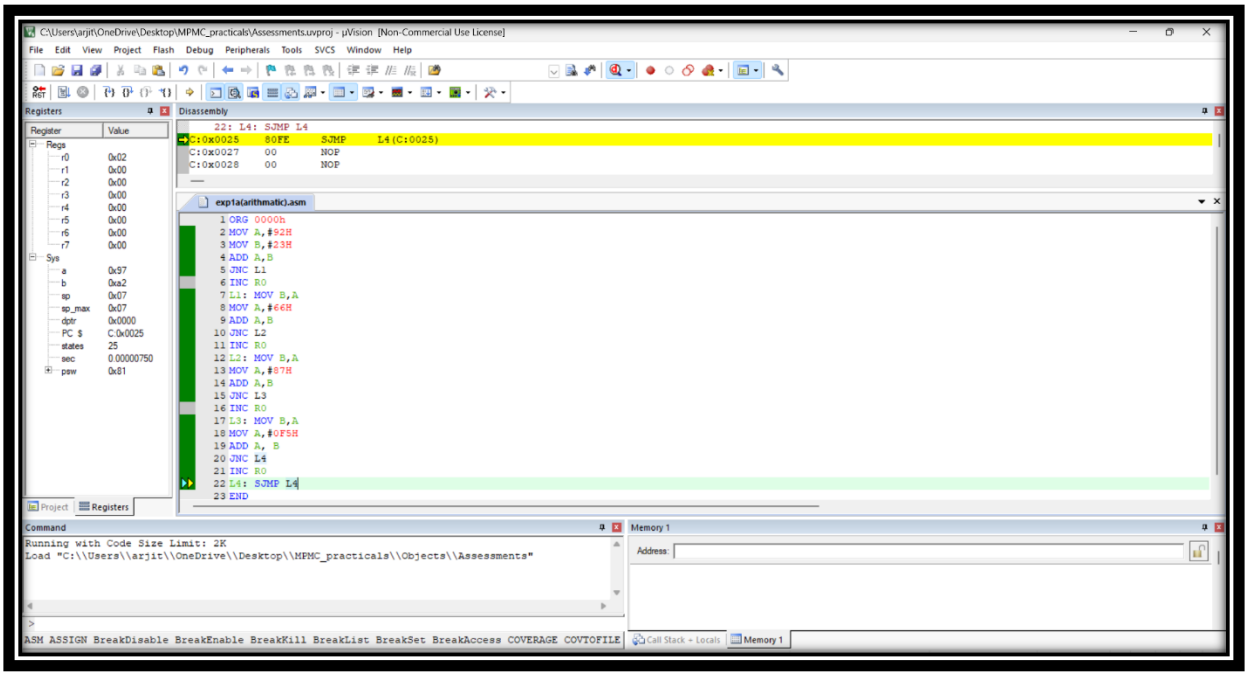
Experiment 1:

a) Write and assemble a program to add the following data and then use the simulator to examine the CY flag.
Input Data: 92H, 23H, 66H, 87H, F5H

Code:

```
ORG 0000h
MOV A,#92H
MOV B,#23H
ADD A,B
JNC L1
INC R0
L1: MOV B,A
MOV A,#66H
ADD A,B
JNC L2
INC R0
L2: MOV B,A
MOV A,#87H
ADD A,B
JNC L3
INC R0
L3: MOV B,A
MOV A,#0F5H
ADD A, B
JNC L4
INC R0
L4: SJMP L4
END
```

Output:



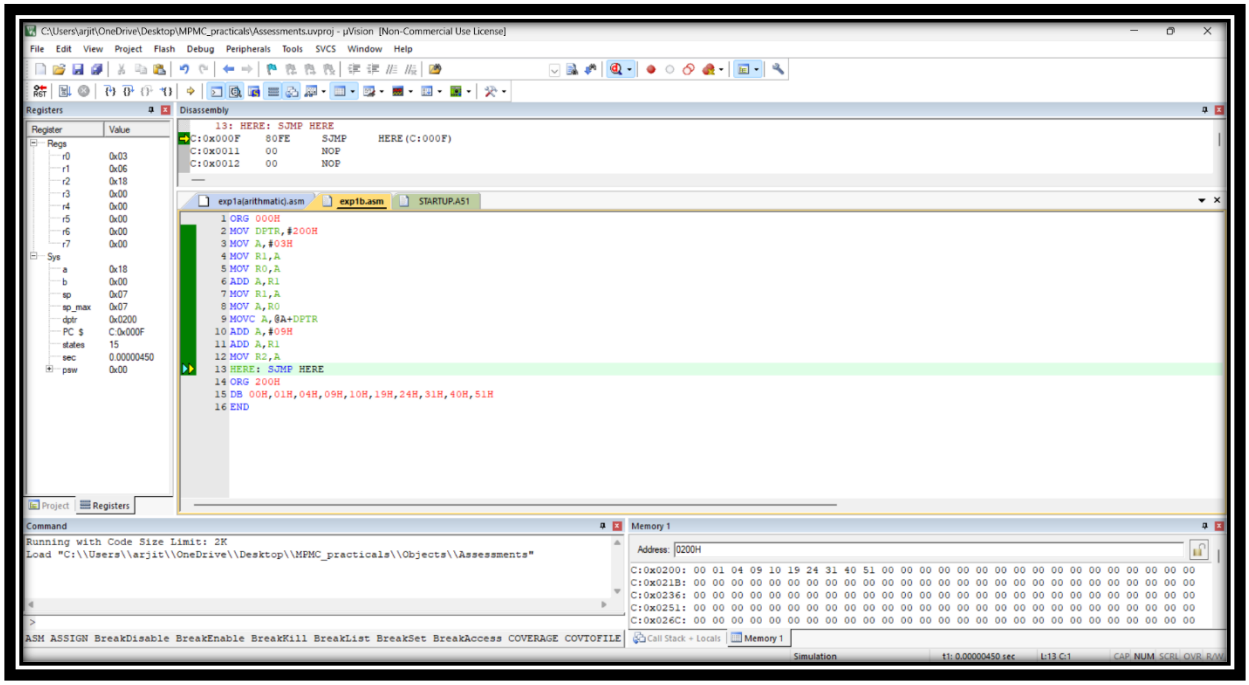
b) Write a program to calculate y where y = x2 + 2x + 9. x is between 0 and 9 and the look-up table for x2 is located at the address (code space) of 200H. Register R0 has the x, and at the end of the program R2 should have y.

Code:

```
ORG 000H
MOV DPTR,#200H
MOV A,#03H
MOV R1,A
MOV R0,A
ADD A,R1
MOV R1,A
MOV A,R0
MOVC A,@A+DPTR
ADD A,#09H
ADD A,R1
MOV R2,A
```

```
HERE: SJMP HERE
ORG 200H
DB 00H,01H,04H,09H,10H,19H,24H,31H,40H,51H
END
```

Output:



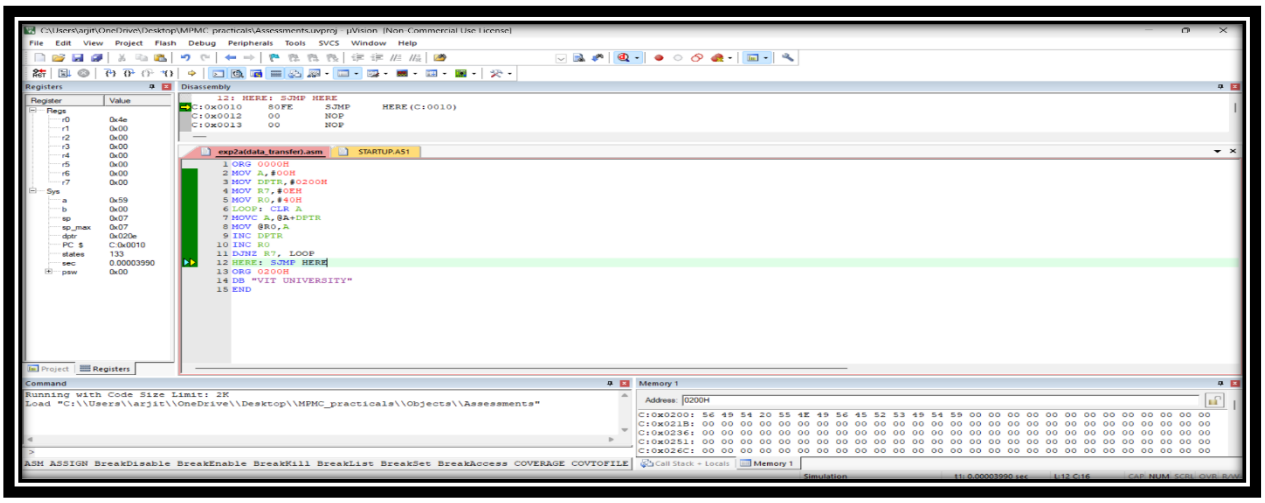
Experiment 2:

a) Write a program to transfer a string of data from code space starting at address 200H to RAM locations starting at 40H. The data is as shown below: 0200H: DB "VIT UNIVERSITY"

Code:

```
ORG 0000H
MOV A,#00H
MOV DPTR,#0200H
MOV R7,#0EH
MOV R0,#40H
LOOP: CLR A
MOVC A,@A+DPTR
MOV @R0,A
INC DPTR
INC R0
DJNZ R7, LOOP
HERE: SJMP HERE
ORG 0200H
DB "VIT UNIVERSITY"
END
```

Output:

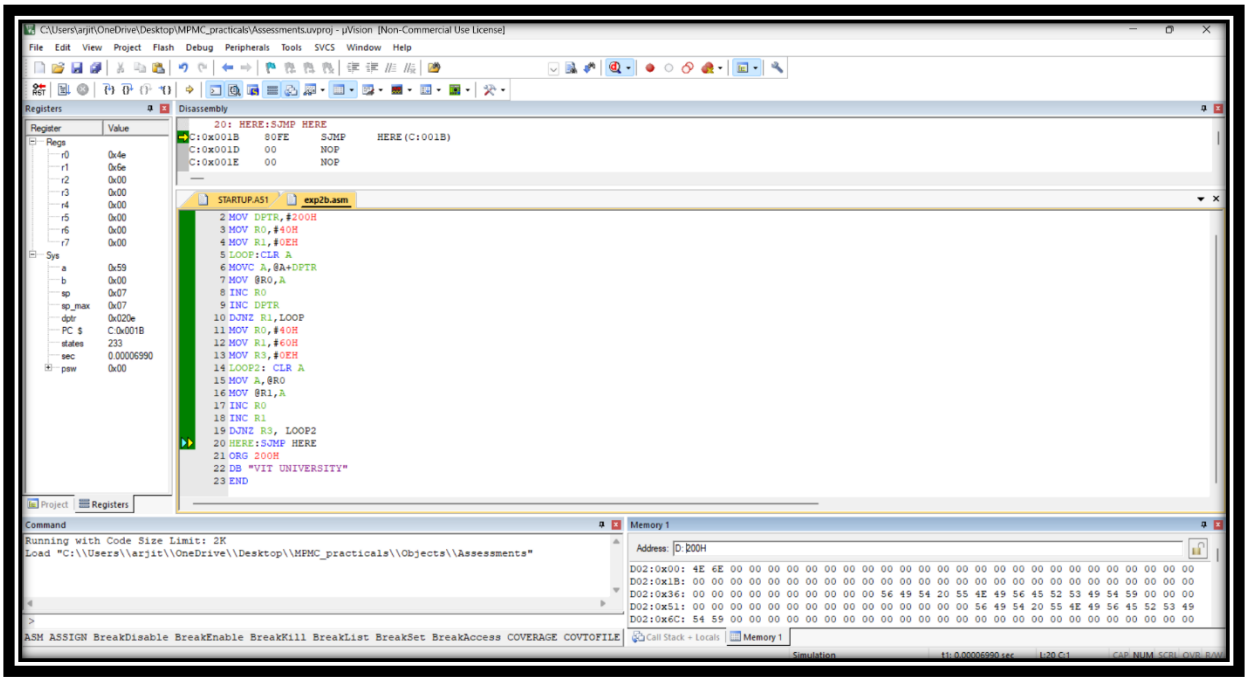


b) Add the following subroutine to the program 1, single-step through the subroutine and examine the RAM locations. After data has been transferred from ROM space into RAM, the subroutine should copy the data from RAM locations starting at 40H to RAM locations starting at 60H.

Code:

```
ORG 000H
MOV DPTR,#200H
MOV R0,#40H
MOV R1,#0EH
LOOP:CLR A
MOVC A,@A+DPTR
MOV @R0,A
INC R0
INC DPTR
DJNZ R1,LOOP
MOV R0,#40H
MOV R1,#60H
MOV R3,#0EH
LOOP2: CLR A
MOV A,@R0
MOV @R1,A
INC R0
INC R1
DJNZ R3, LOOP2
HERE:SJMP HERE
ORG 200H
DB "VIT UNIVERSITY"
END
```

Output:


C:\Users\arjit\OneDrive\Desktop\MPMC_practicals\Assessments.uvproj - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x4e
r1 0x5e
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0x59
b 0x00
sp 0x07
sp_max 0x07
dptr 0x020e
PC $ C:0x001B
states 233
sec 0.00006990
psw 0x00
Disassembly
20: HERE:SJMP HERE
C:0x001B 80FE SJMP HERE(C:001B)
C:0x001D 00 NOP
C:0x001E 00 NOP
STARTUP.A51
exp2b.asm
2 MOV DPTR,#200H
3 MOV R0,#40H
4 MOV R1,#0EH
5 LOOP:CLR A
6 MOVC A,@A+DPTR
7 MOV @R0,A
8 INC R0
9 INC DPTR
10 DJNZ R1,LOOP
11 MOV R0,#40H
12 MOV R1,#60H
13 MOV R3,#0EH
14 LOOP2: CLR A
15 MOV A,@R0
16 MOV @R1,A
17 INC R0
18 INC R1
19 DJNZ R3, LOOP2
20 HERE:SJMP HERE
21 ORG 200H
22 DB "VIT UNIVERSITY"
23 END
Project Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\arjit\\OneDrive\\Desktop\\MPMC_practicals\\Objects\\Assessments"
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Memory 1
Address: D:200H
D02:0x00: 4E 6E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
D02:0x1B: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
D02:0x36: 00 00 00 00 00 00 00 00 00 00 56 49 54 20 55 4E 49 56 45 52 53 49 54 59 00 00 00 00
D02:0x51: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 56 49 54 20 55 4E 49 56 45 52 53 49
D02:0x6C: 54 59 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
Call Stack + Locals
Memory 1
Simulation