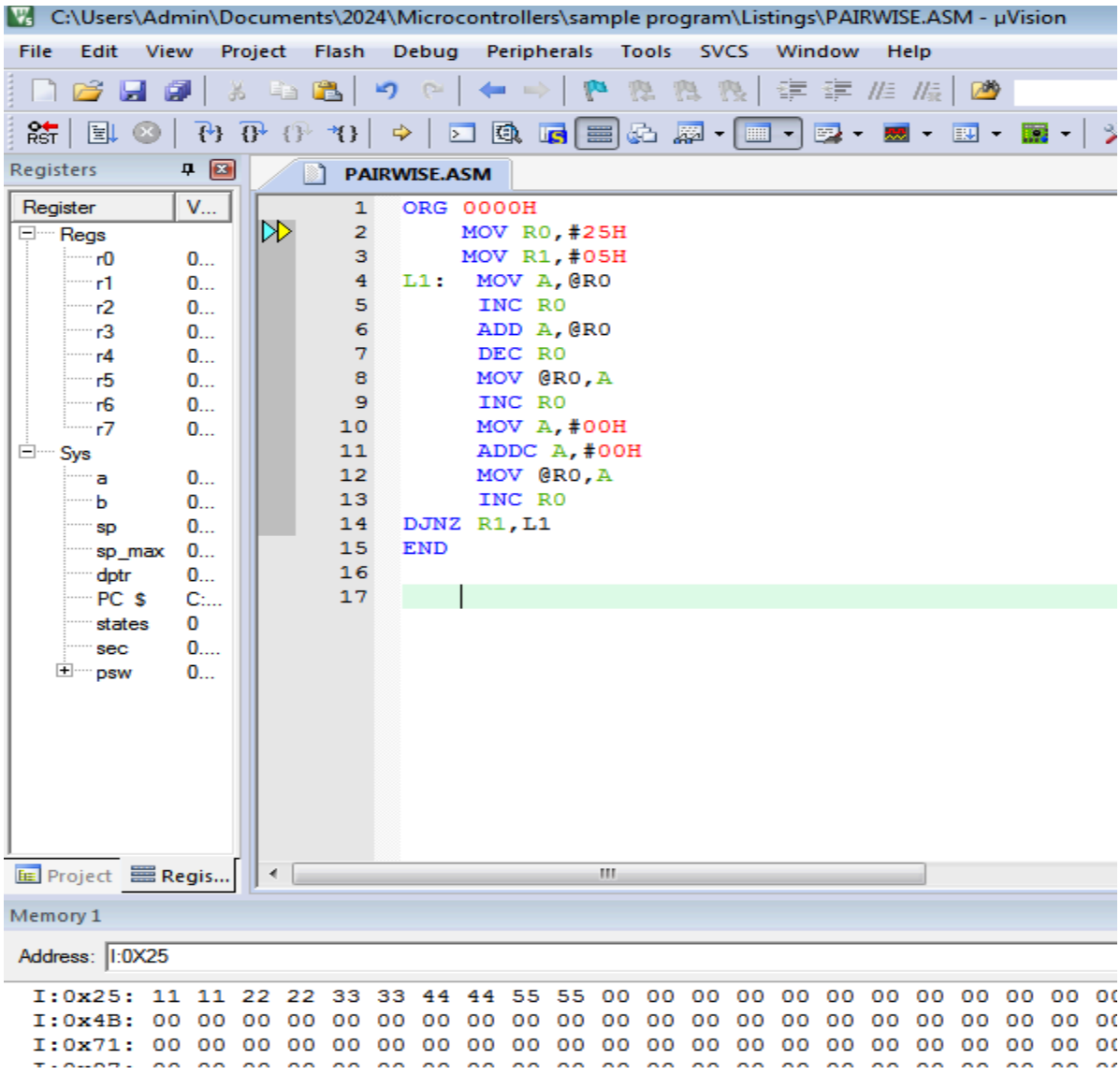
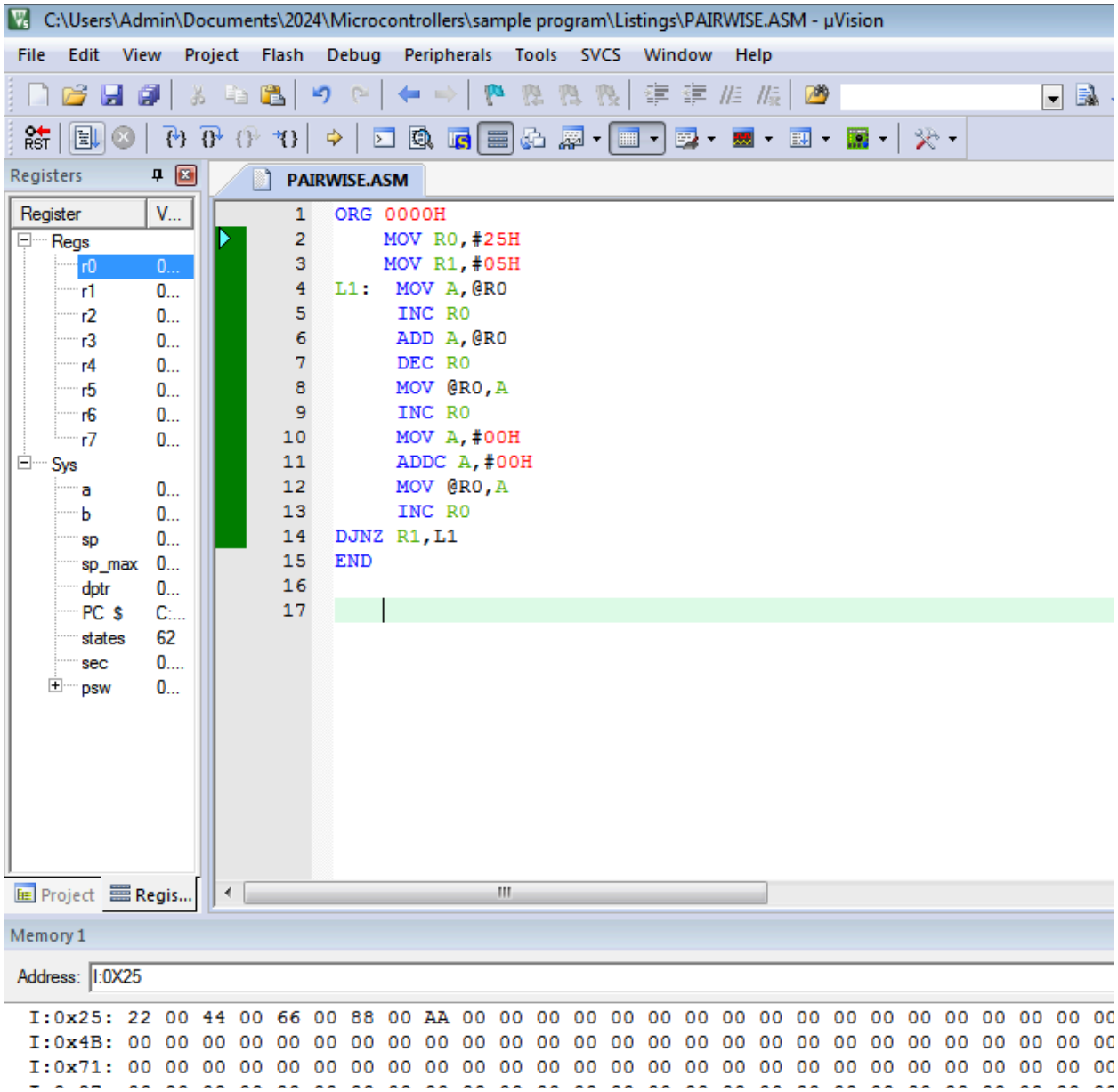
15	**Title:** Pairwise addition **Problem Statement:** 5 pairs of data bytes are stored in internal RAM locations starting at the address 25H. WAP to perform pairwise addition and save the result in same memory locations, i.e. sum replacing the first data byte and carry replacing the second one. [CO 1,2,3]

Before execution

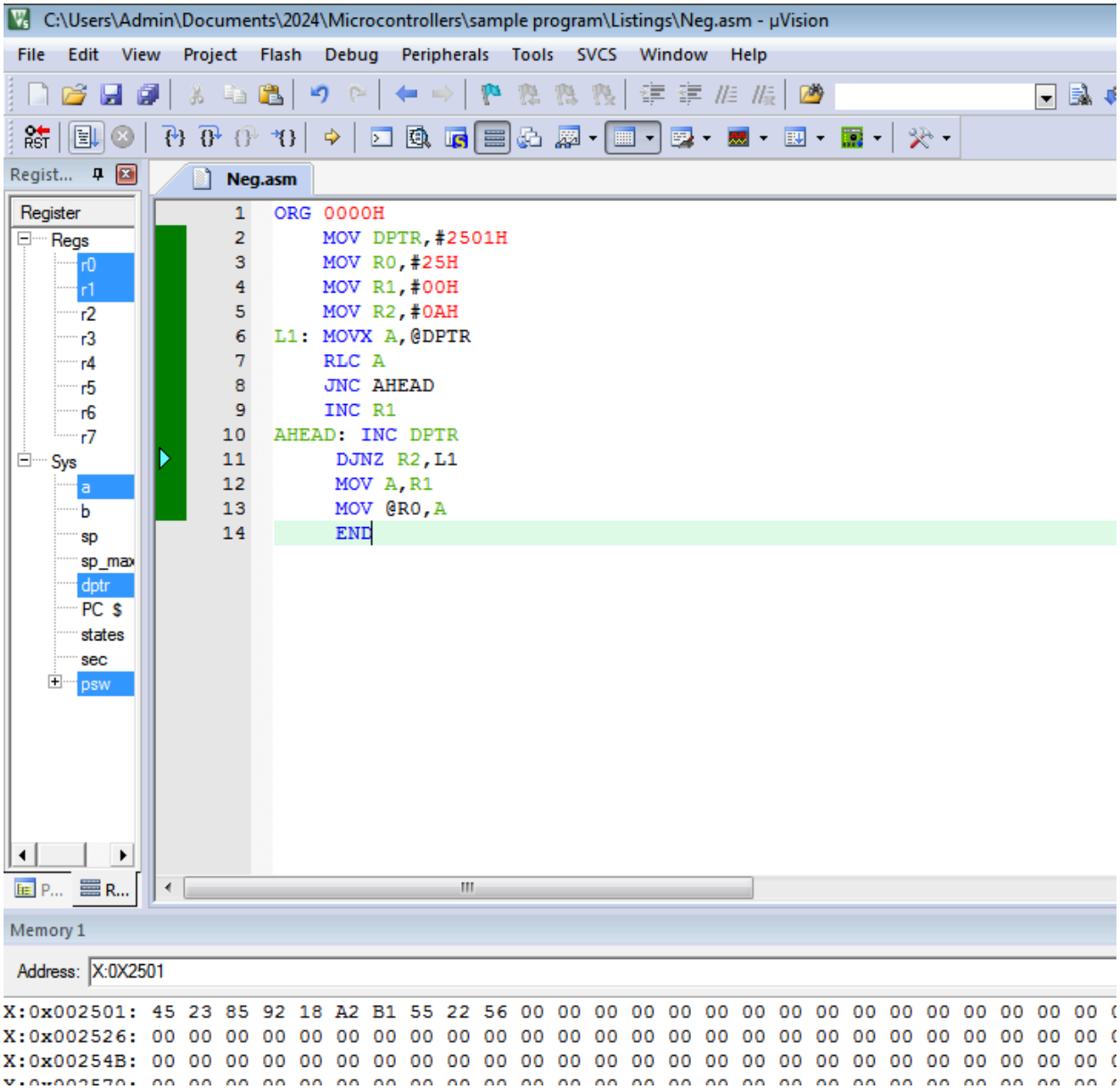


After execution

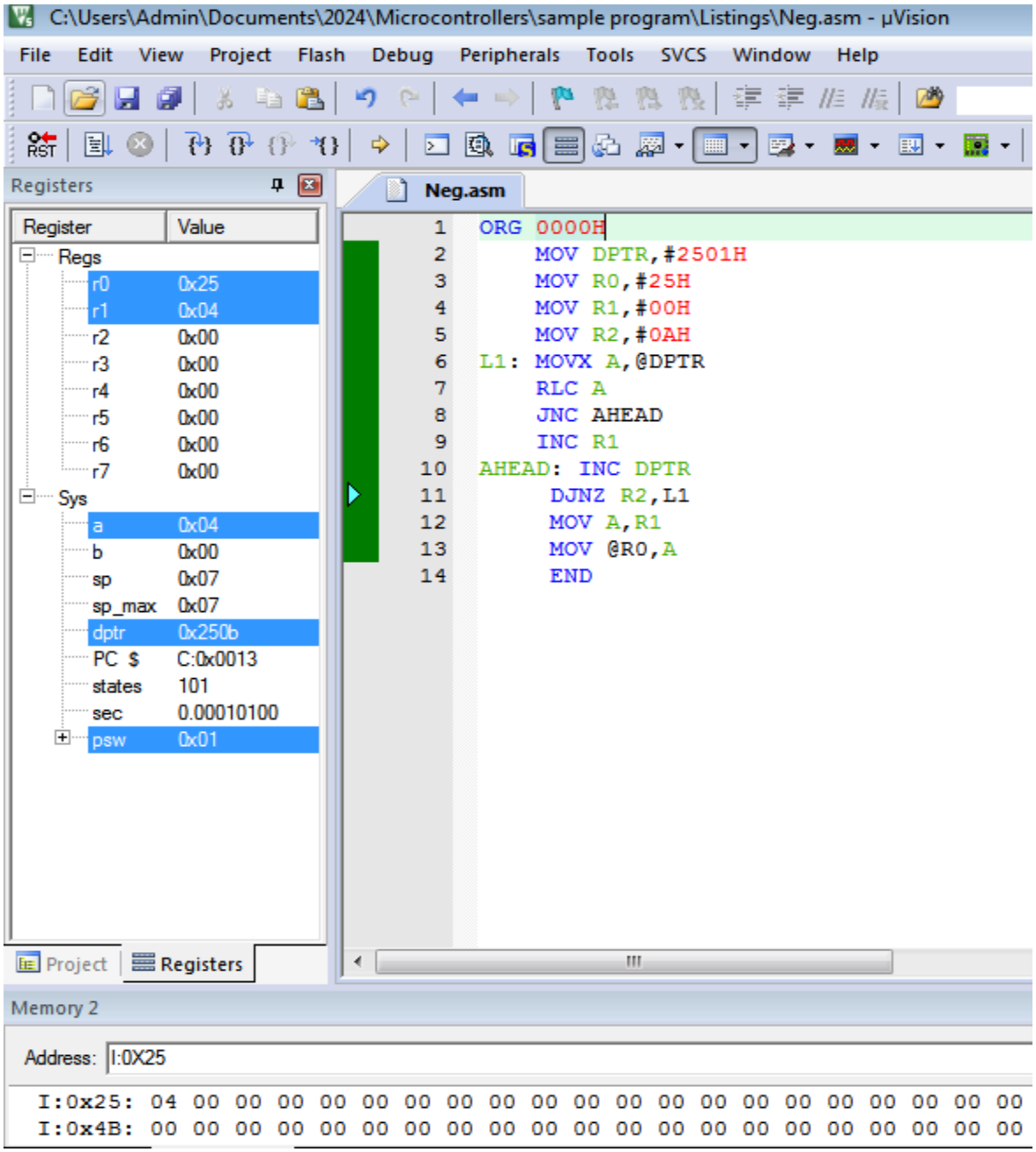


16	**Title:** To count number of negative data bytes. **Problem Statement:** A series of 10 data bytes is stored in external RAM locations starting at 2501H. WAP to perform to count number of negative data bytes and save the result (count) in internal RAM location with address 25H. [CO 1,2,3]

Before execution

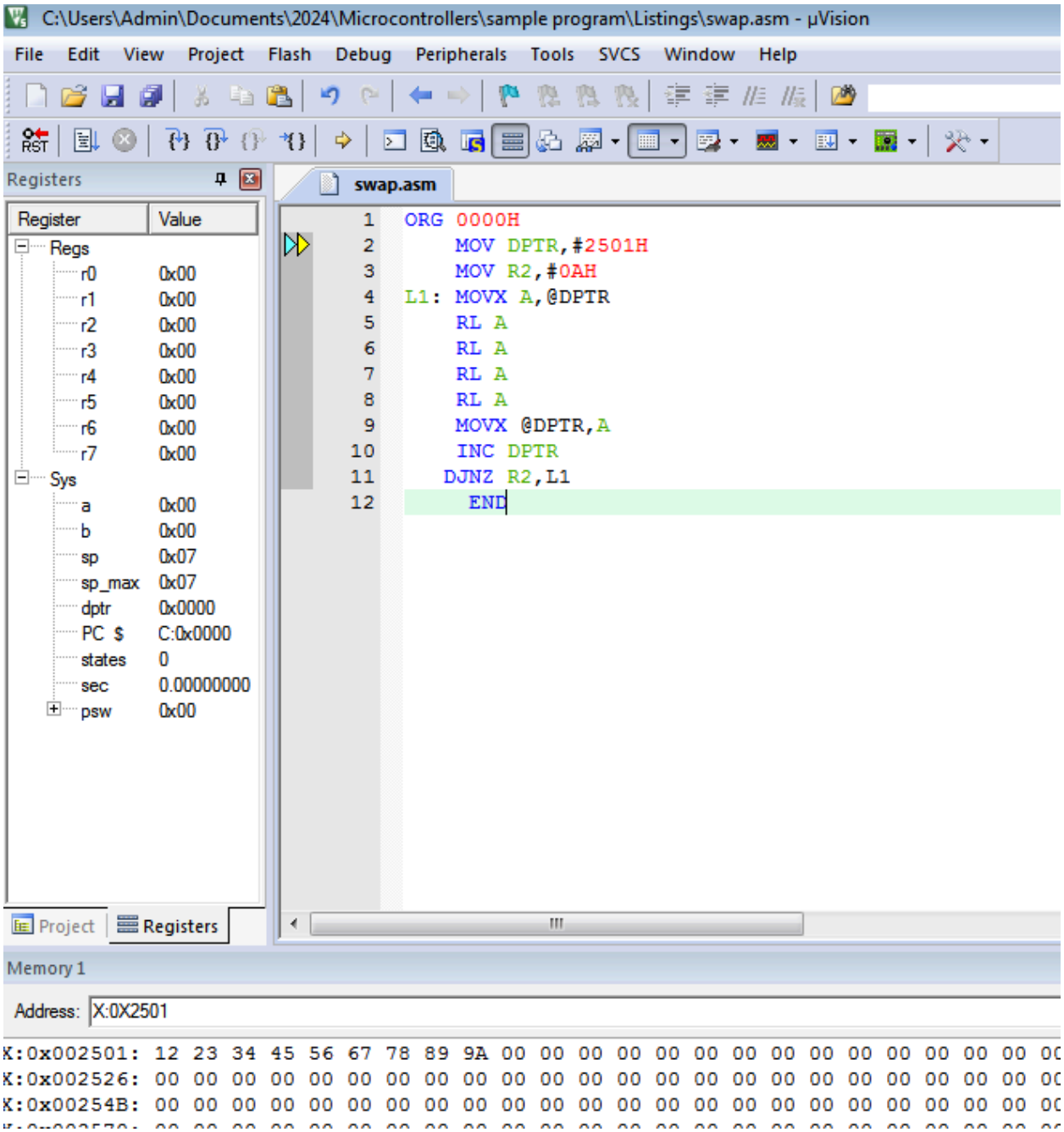


After execution

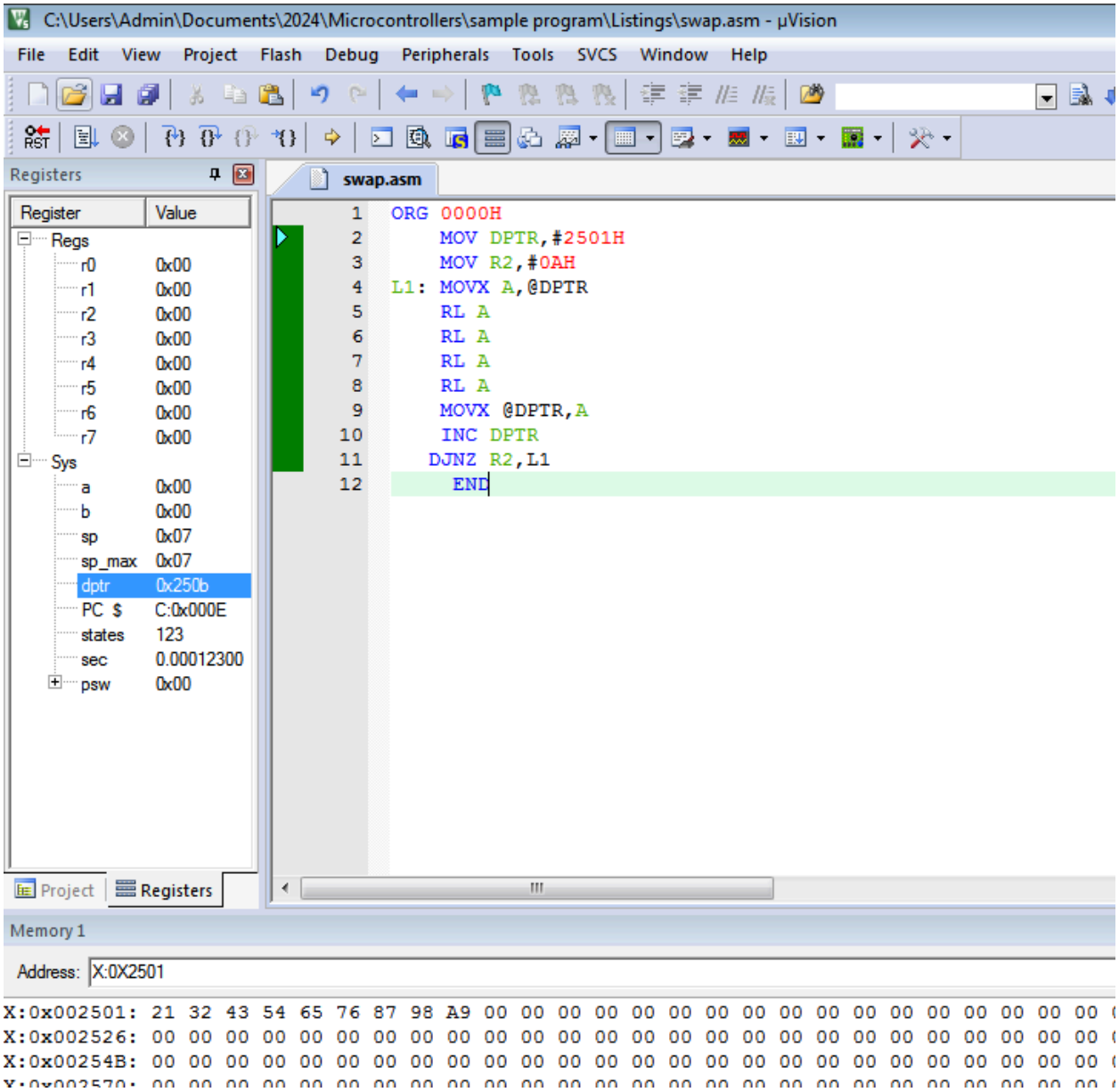


17	**Title:** To swap the nibbles **Problem Statement:** A series of 10 data bytes is stored in external RAM locations starting at 2501H. WAP to perform to swap the nibbles of the data bytes and save the result in same memory locations. [CO 2,3]

Before

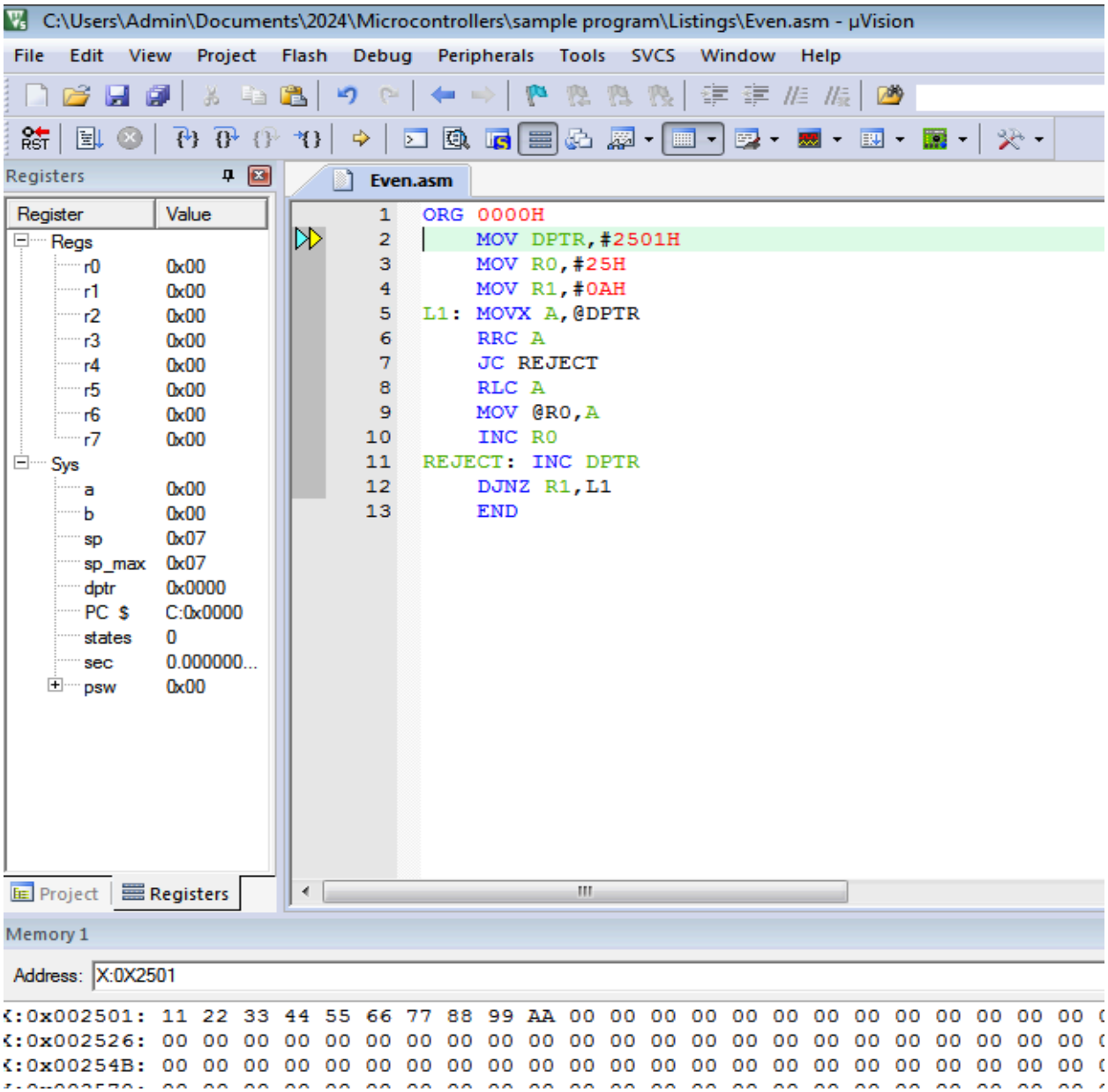

C:\Users\Admin\Documents\2024\Microcontrollers\sample program\Listings\swap.asm - µVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x00
r1 0x00
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0x00
b 0x00
sp 0x07
sp_max 0x07
dptr 0x0000
PC $ C:0x0000
states 0
sec 0.00000000
psw 0x00
Project
Registers
swap.asm
1 ORG 0000H
2 MOV DPTR,#2501H
3 MOV R2,#0AH
4 L1: MOVX A,@DPTR
5 RL A
6 RL A
7 RL A
8 RL A
9 MOVX @DPTR,A
10 INC DPTR
11 DJNZ R2,L1
12 END
Memory 1
Address: X:0X2501
X:0x002501: 12 23 34 45 56 67 78 89 9A 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
X:0x002526: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
X:0x00254B: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

After

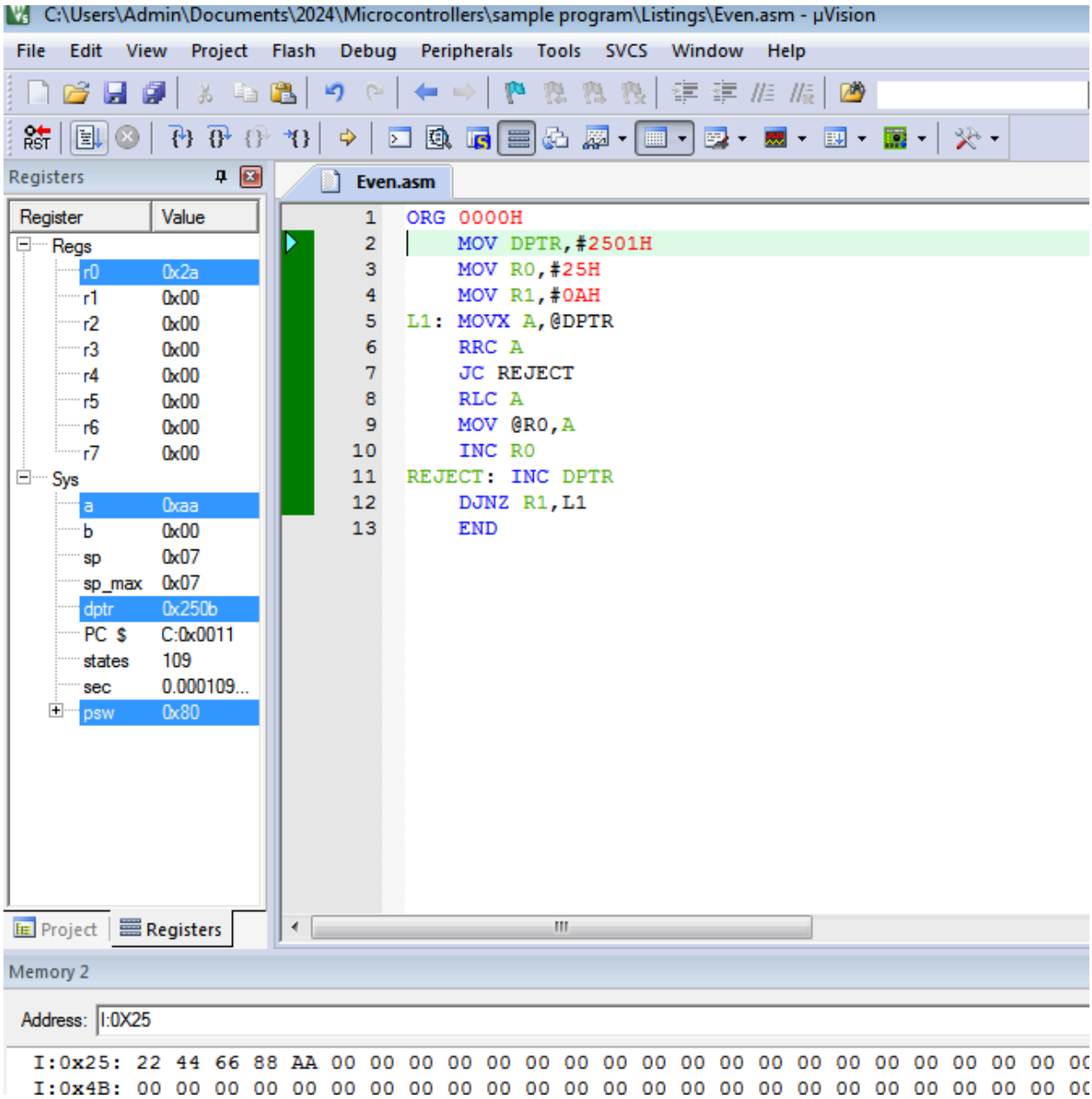

C:\Users\Admin\Documents\2024\Microcontrollers\sample program\Listings\swap.asm - µVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x00
r1 0x00
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0x00
b 0x00
sp 0x07
sp_max 0x07
dptr 0x250b
PC $ C:0x000E
states 123
sec 0.00012300
psw 0x00
Project
Registers
swap.asm
1 ORG 0000H
2 MOV DPTR,#2501H
3 MOV R2,#0AH
4 L1: MOVX A,@DPTR
5 RL A
6 RL A
7 RL A
8 RL A
9 MOVX @DPTR,A
10 INC DPTR
11 DJNZ R2,L1
12 END
Memory 1
Address: X:0X2501
X:0x002501: 21 32 43 54 65 76 87 98 A9 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
X:0x002526: 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
X:0x00254B: 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

18	**Title:** Data Transfer (even numbers only) **Problem Statement:** A series of 10 data bytes is stored in external RAM locations starting at 2501H. WAP to identify and transfer even data bytes in internal RAM locations starting at 25H, while rejecting odd numbers. [CO 2,3]

Before



After


C:\Users\Admin\Documents\2024\Microcontrollers\sample program\Listings\Even.asm - µVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x2a
r1 0x00
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0xaa
b 0x00
sp 0x07
sp_max 0x07
dptr 0x250b
PC $ C:0x0011
states 109
sec 0.000109...
psw 0x80
Project
Registers
Even.asm
1 ORG 0000H
2 MOV DPTR,#2501H
3 MOV R0,#25H
4 MOV R1,#0AH
5 L1: MOVX A,@DPTR
6 RRC A
7 JC REJECT
8 RLC A
9 MOV @R0,A
10 INC R0
11 REJECT: INC DPTR
12 DJNZ R1,L1
13 END
Memory 2
Address: I:0X25
I:0x25: 22 44 66 88 AA 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
I:0x4B: 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