Embedded Systems
Lab Assignment - 1

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Answer 1

Code-1: Folder Name Q1-Code-1
Code-2: Folder Name Q1-Code-2

Answers

a) On reset the mode of operation is **Supervisor.**

b) States taken by Arithmetic, Load and Store instruction is as follows:

1. Arithmetic Instruction: **1 State**
2. Load Instruction: **3 States**
3. Store Instruction: **2 States**

c) The number of states taken by BGE instruction is not same in case of branch is taken and branch not taken. The following is the number of states taken in each case

1. Branch is not taken: **1 State**
2. Branch is taken: **3 States**

d) States taken for both programs excluding last B STOP instruction:

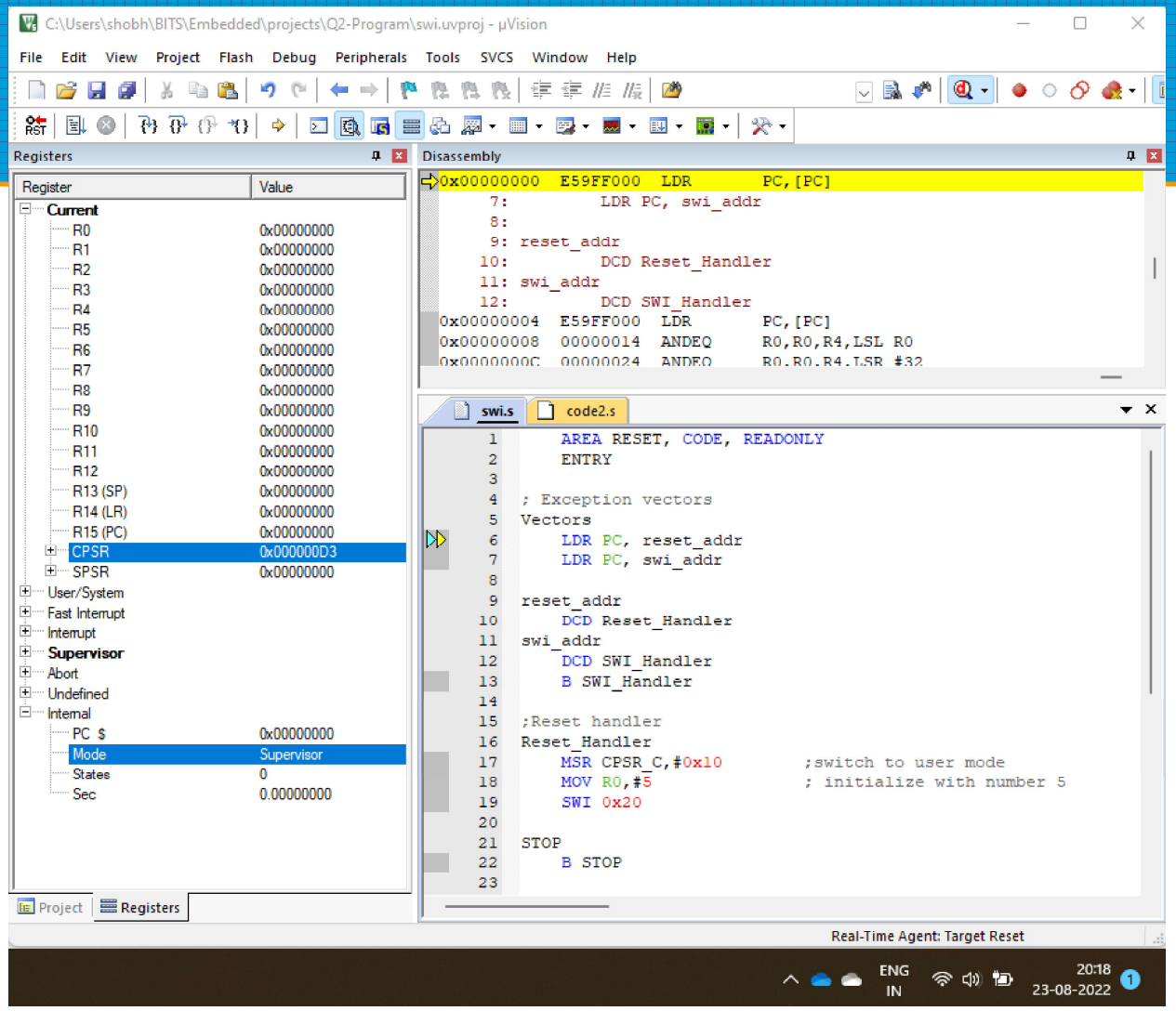
Condition	Code-1 States	Code-2 States
a < b	33	30
a > b	29	29
a = b	29	29

Answer 2

Code: Folder Name : SWI

Step 1:

After reset device is in supervisor mode

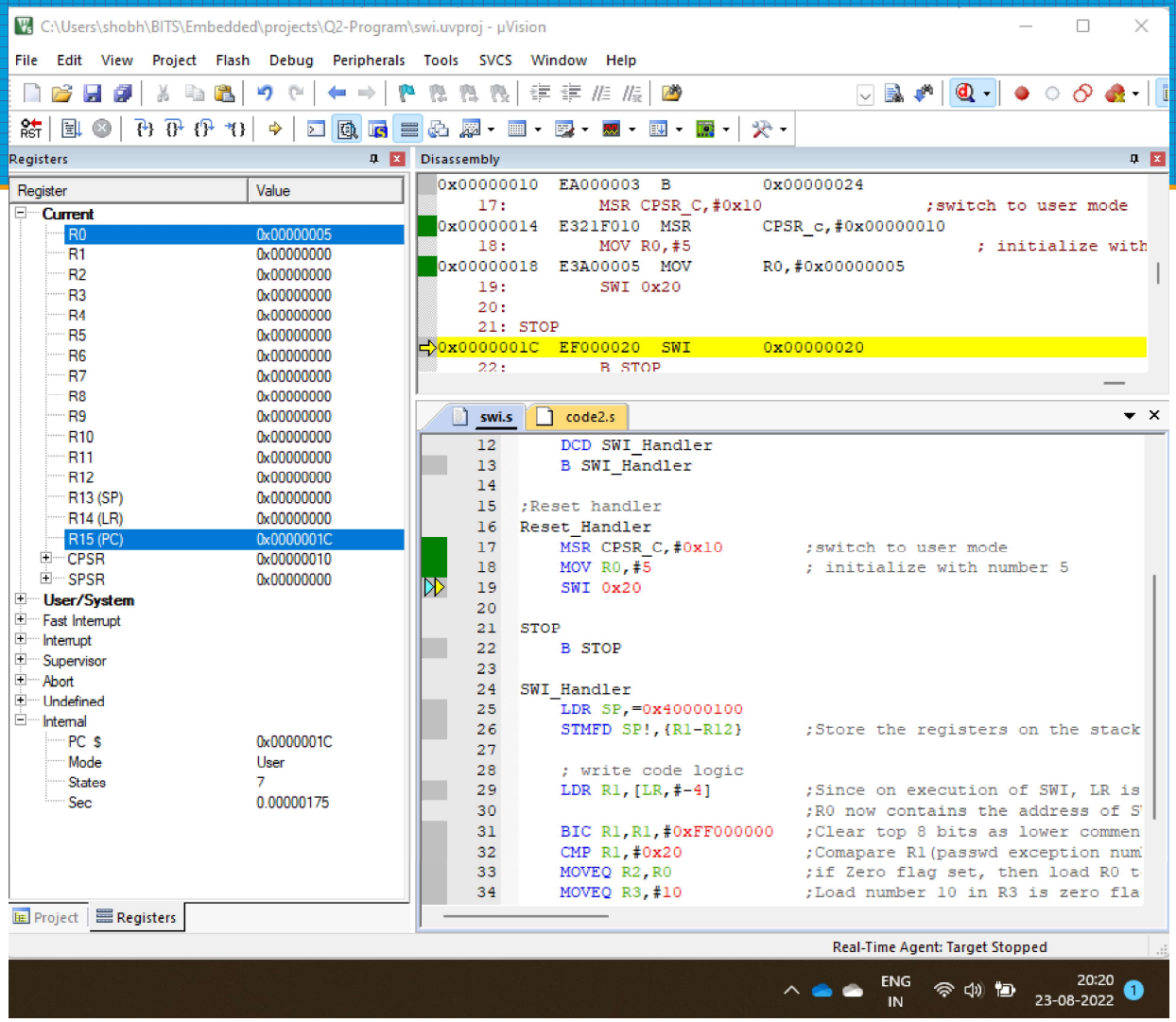


Answer 2

Code: Folder Name : SWI

Step 2:

Device is in user mode after updating CPSR

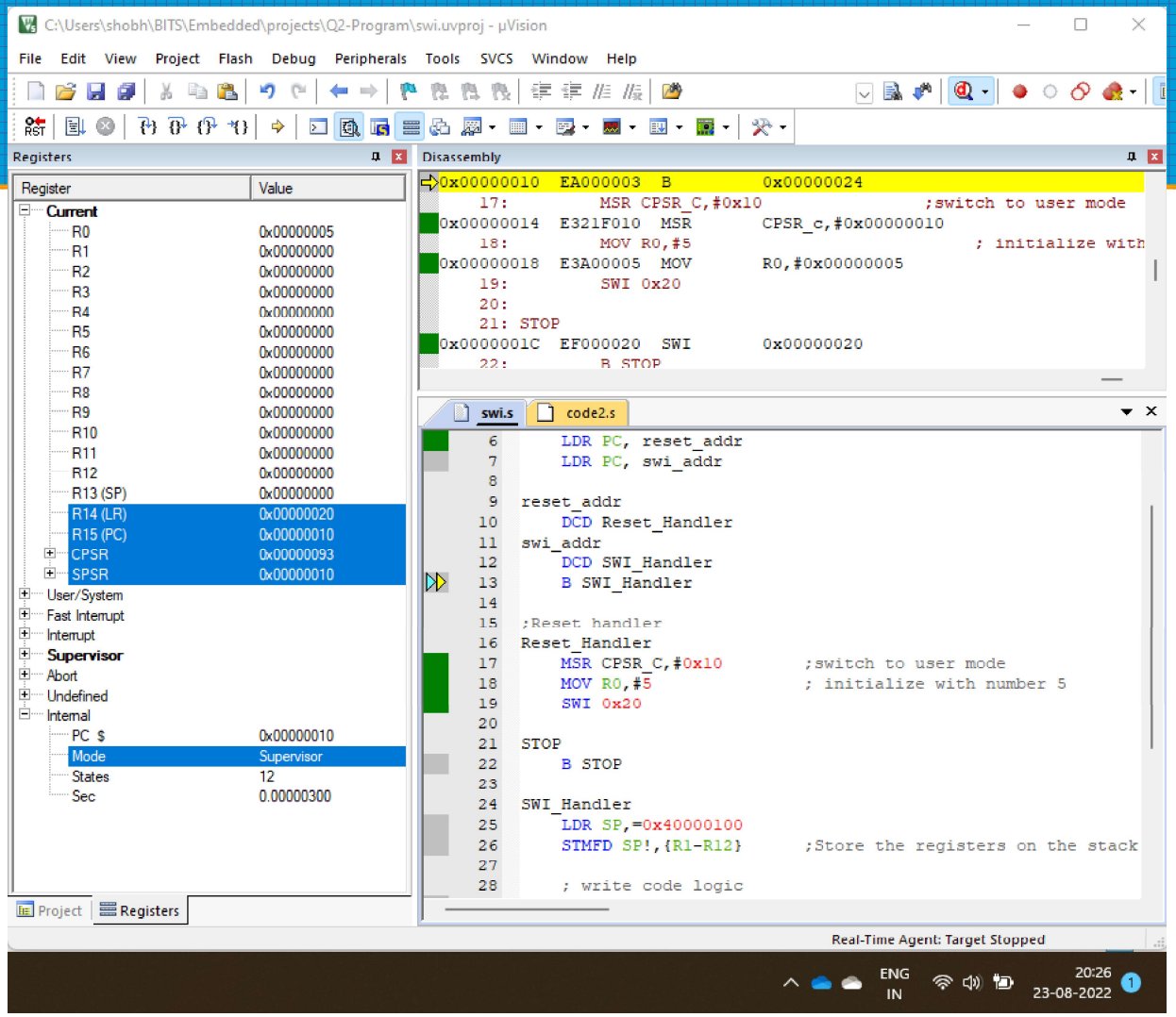


Answer 2

Code: Folder Name : SWI

Step 3:

Device switches to supervisor mode on executing SWI instruction

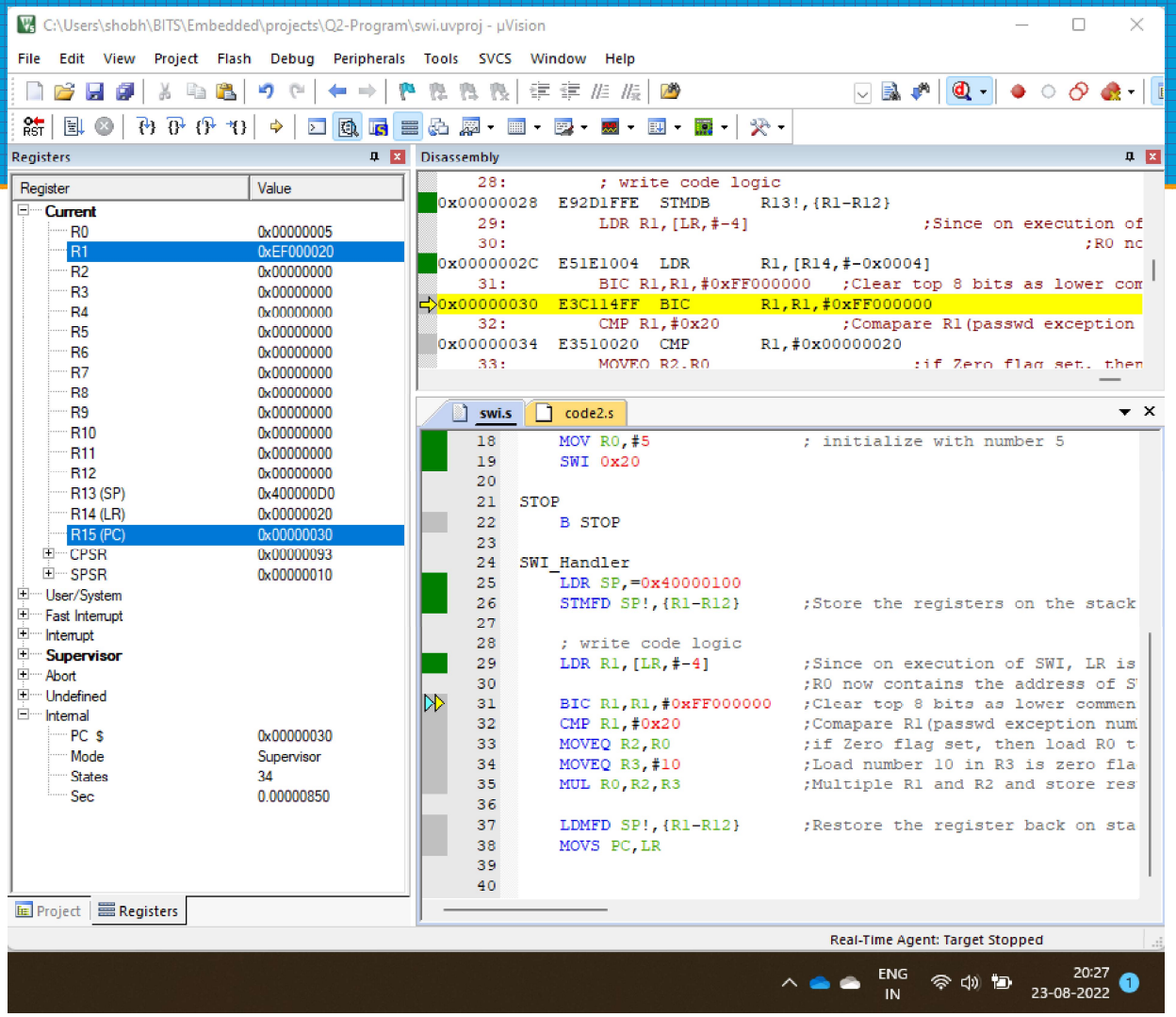


Answer 2

Code: Folder Name : SWI

Step 4:

SWI exception code is extracted in R1 register after decrementing LR by 4 as the address of SWI instruction. Clearing top 8 bits we get the exception code

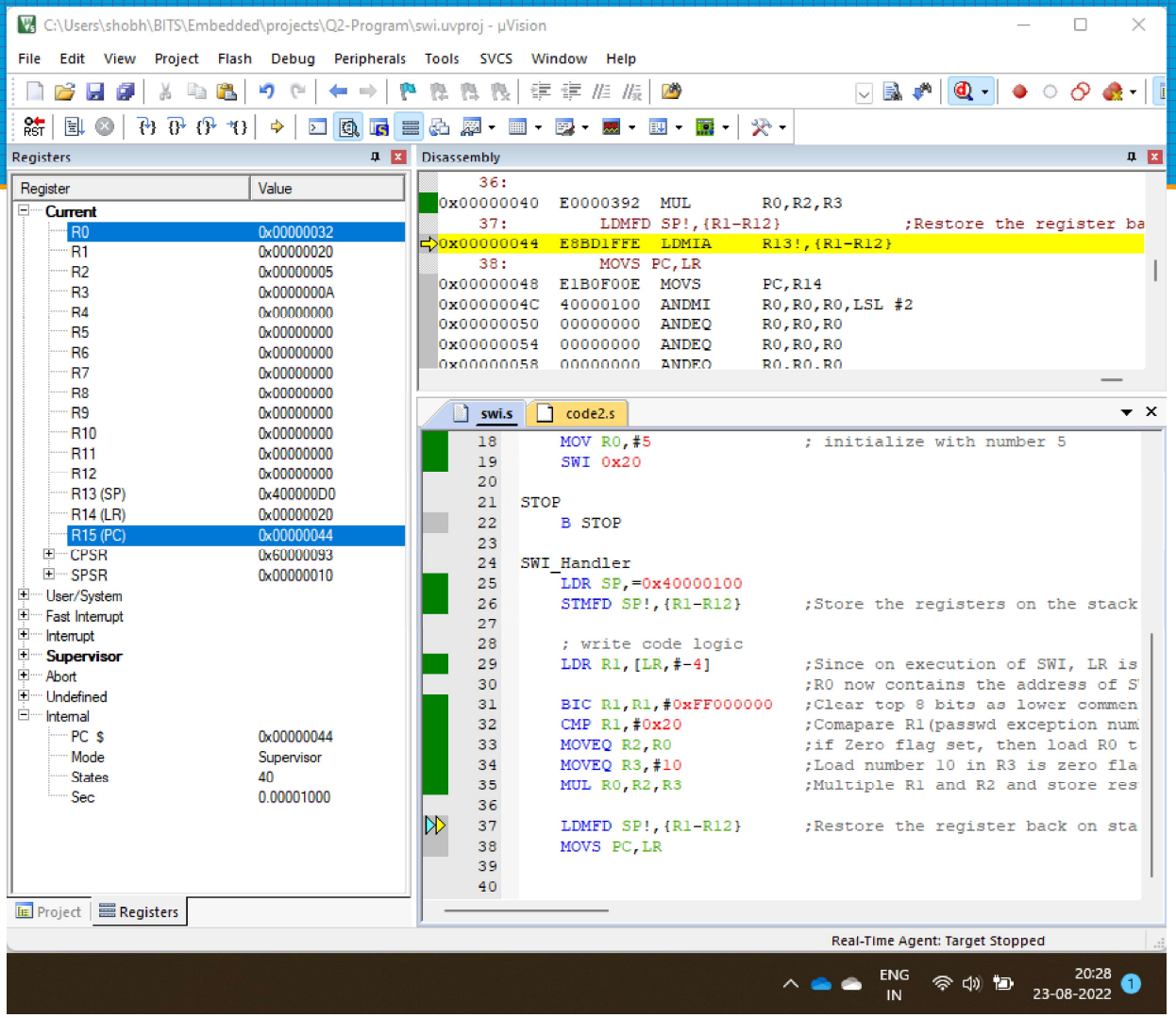


Answer 2

Code: Folder Name : SWI

Step 5:

Multiplication is done and R0 has the result

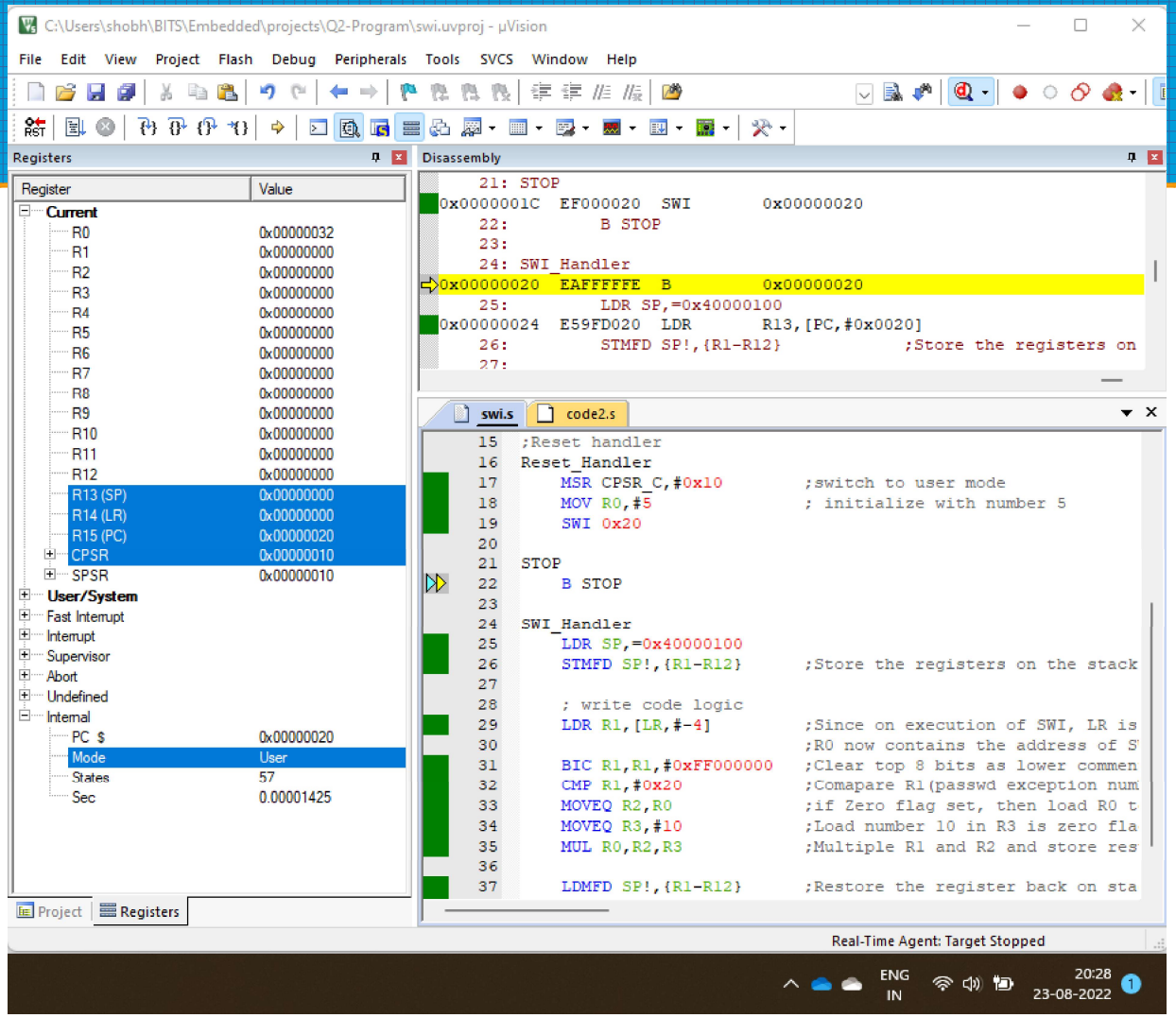


Answer 2

Code: Folder Name : SWI

Step 6:

Return to user mode. R0 is maintained as multiplication result as exception code passed was 0x20

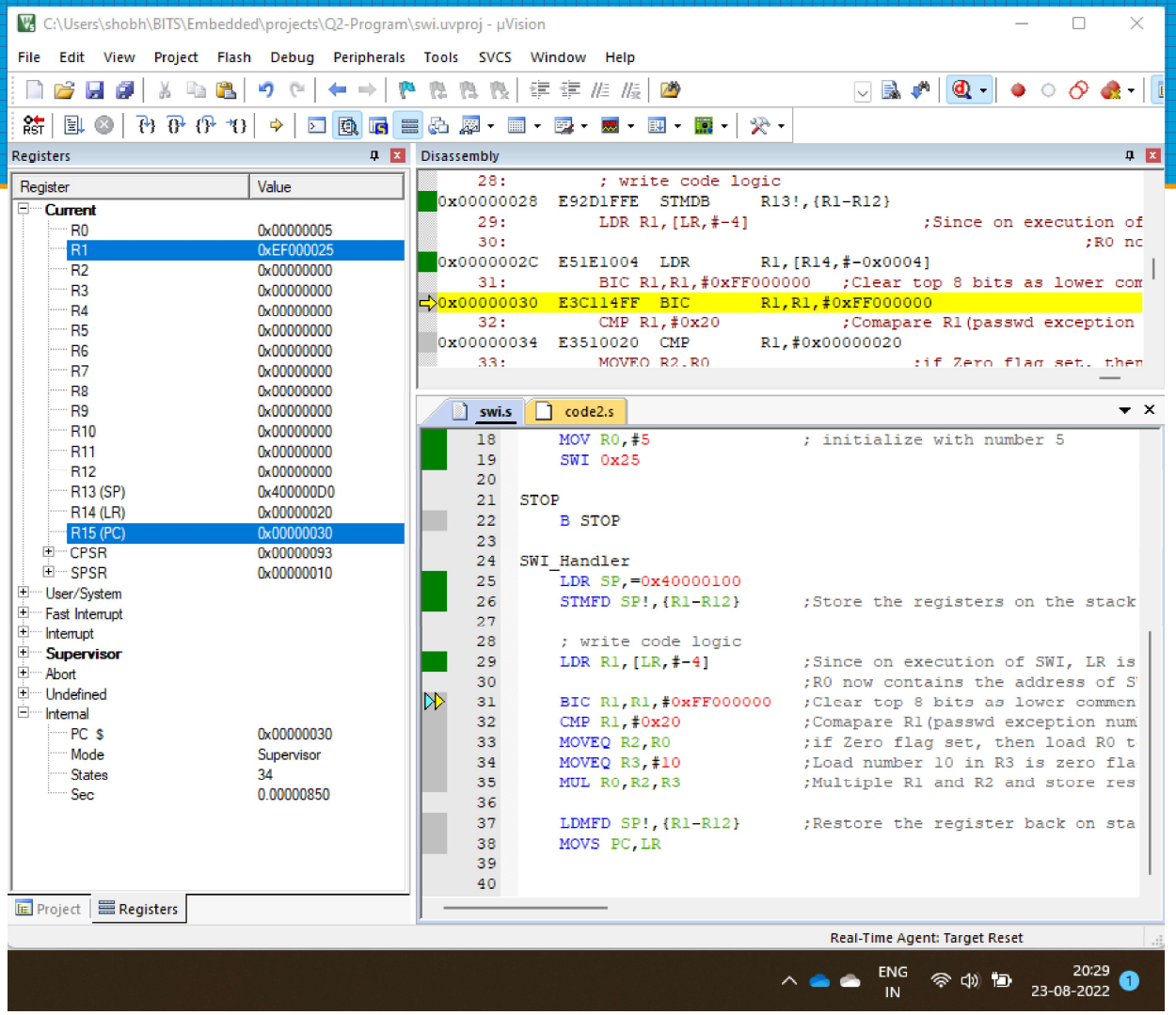


Answer 2

Code: Folder Name : SWI

Step 7:

Trying with SWI 0x25. After executing BIC which clears top 8 bits R1 will have 0x25



Answer 2

Code: Folder Name : SWI

Step 8:

When we return to usermode R0 is maintained as 0x00000000