Factorial: C = A!

Calculate the factorial of the number held in variable A. The number in variable A must be greater than 0 and less than or equal to 6! = 720 (note: 5! = 120). Store factorial of A into 16 bit variable C. Byte ordering is little endian. C = A!

C1:C0 = A!

Simulation of the factorial problem 3! = 6

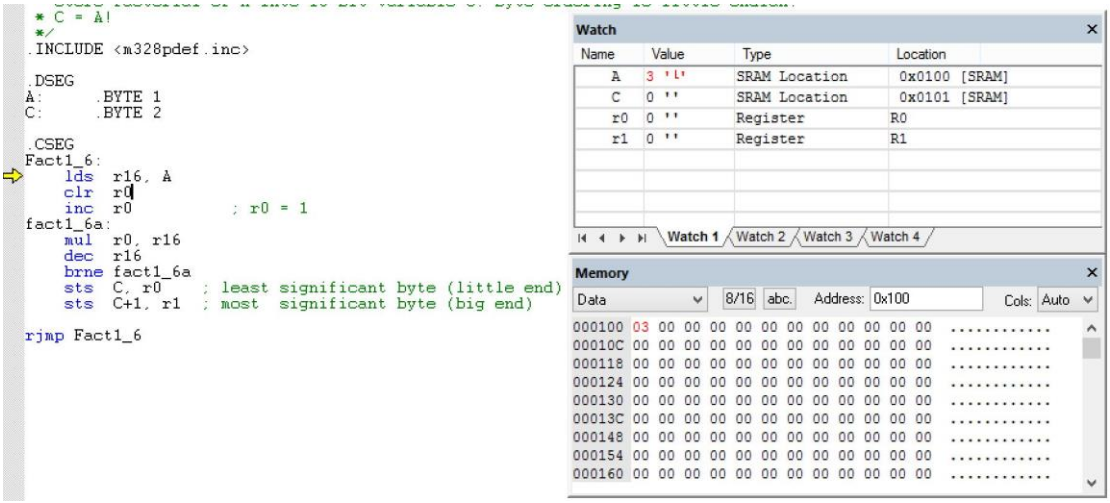

Figure 1: First initialize A to 0x0003 (3 decimal). Set variable A to “3” in the Watch window.

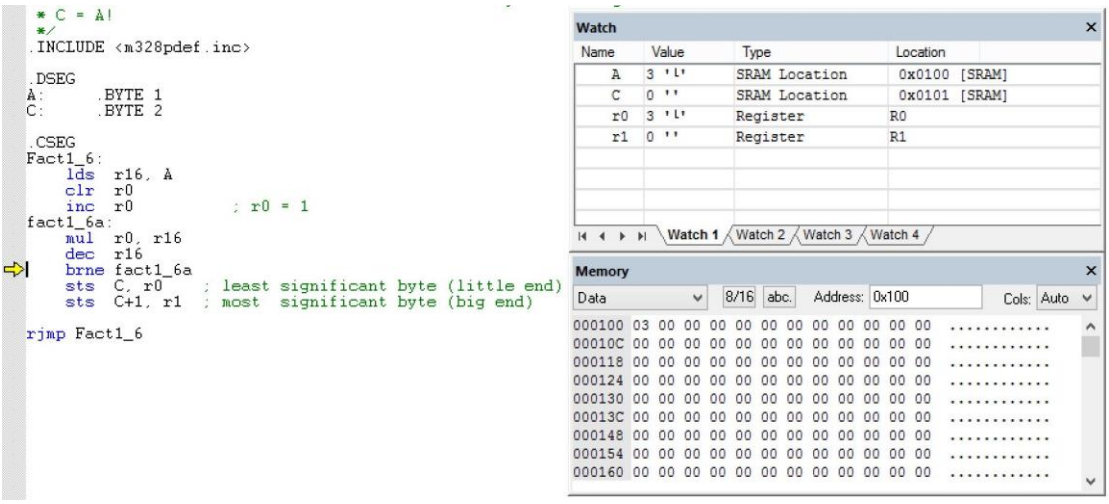

Figure 2: Loop 1 performs the first part of the calculation of A! by doing 3x1 with command “mul r0, r16”. The product 0x0003 is stored in the r1:r0 register pair.

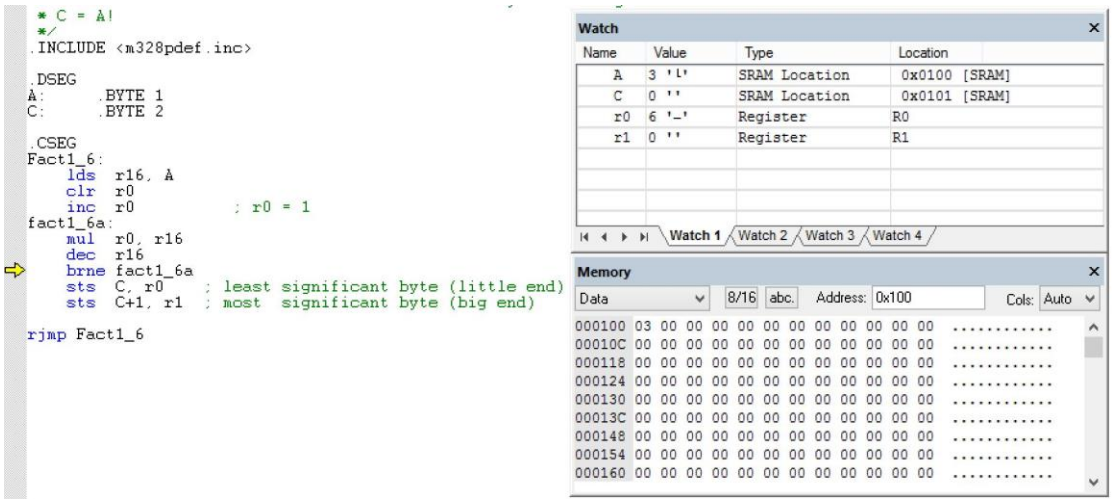

Figure 3: Loop 2 performs the second part of calculation of A! by multiplying 2x3 with the product 0x0006 now in the r1:r0 register pair.

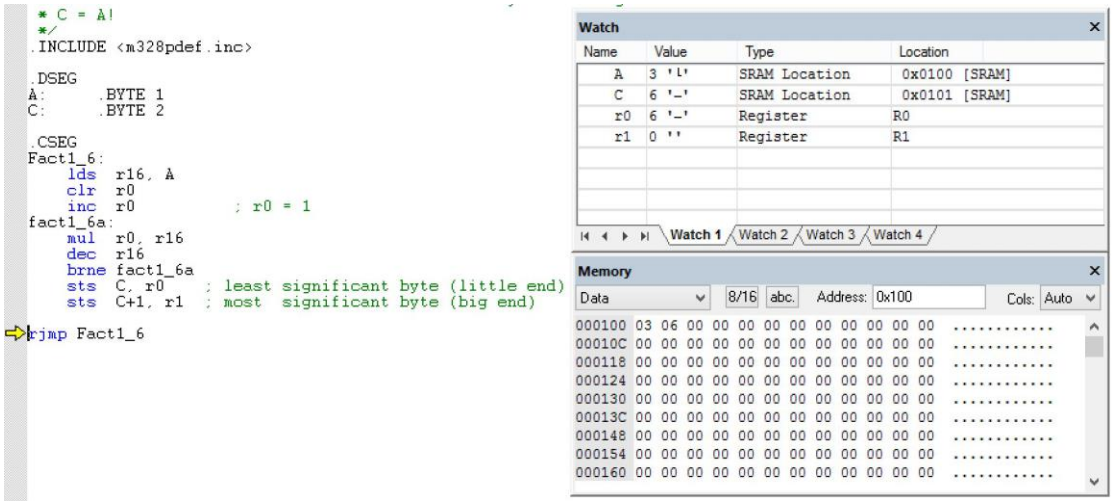

Figure 4: In the 3rd and final loop the result 0x0006 in register pair r1:r0 is saved in 2 byte variable C. Byte ordering is little endian.

Simulation of the factorial problem 5! = 120

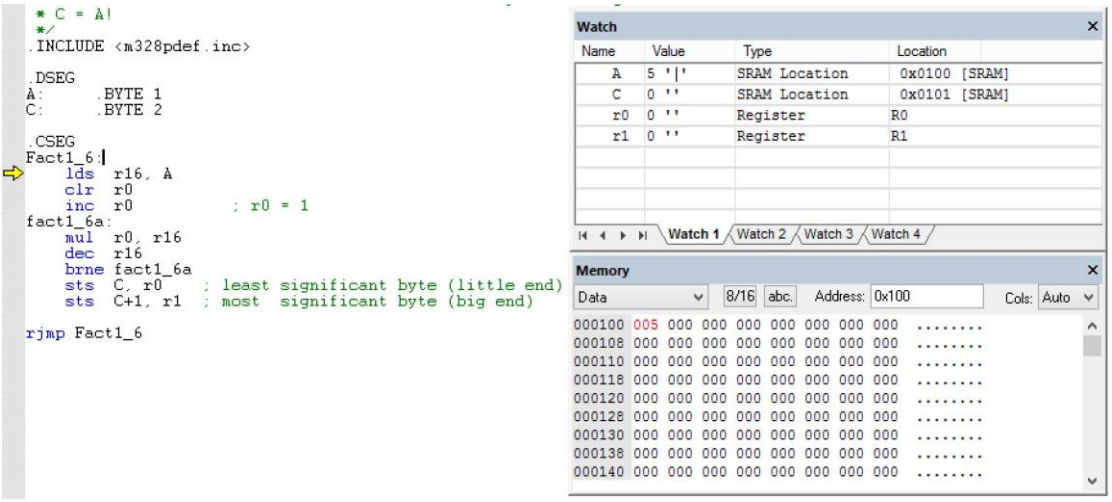

Figure 1: First initialize A to 0x0005 (5 decimal). Set variable A to “5” in the Watch window.

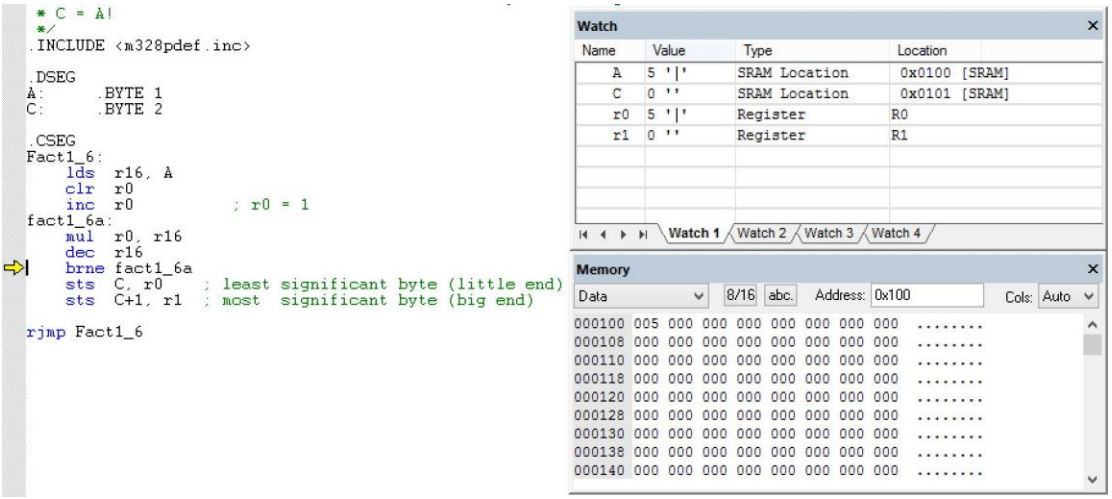

Figure 2: Loop 1 performs the first part of the calculation of A! by doing 5x1 with command “mul r0, r16”. The product 0x0005 is stored in the r1:r0 register pair.

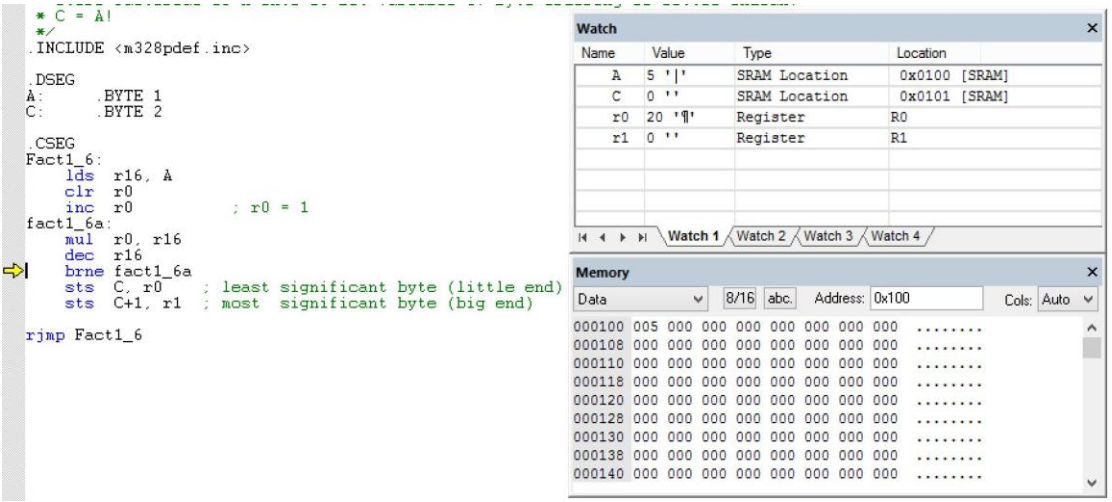

Figure 3: In the loop 2, perform the second part of calculation of A! by doing 4x5 with command “mul

r0, r16". The result 20 which is stored in register pair r1:r0.

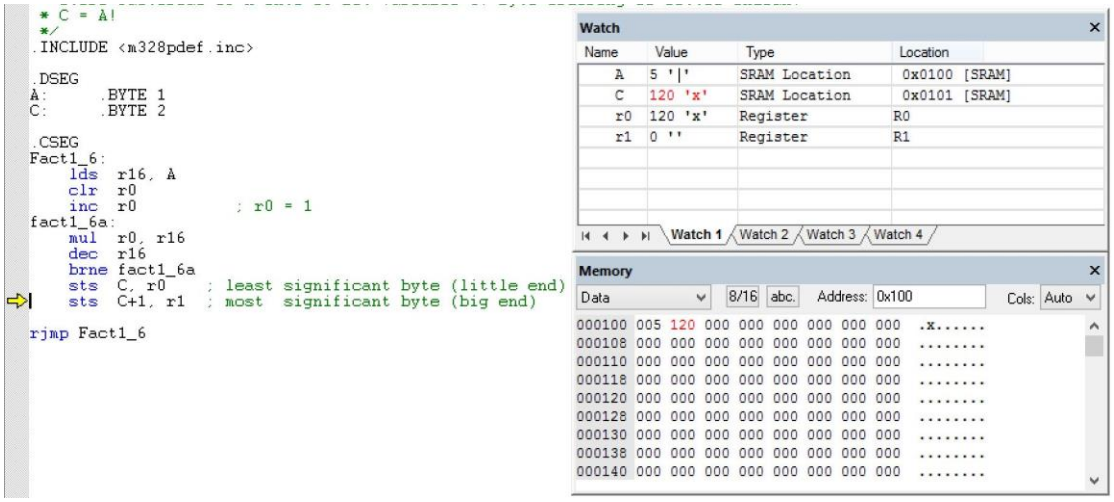

Figure 4: In the 5th and final loop the result 102_{10} in register pair r1:r0 is saved in 2 byte variable C. The most significant byte, equal to 0, will be saved next. Byte ordering is little endian.