## Unsigned 8-bit Multiply with 8-bit result in 16-bit

Given variables A and B, each holding an 8-bit signed 2's complement number. Write a program to find the maximum value and put into variable C. Example if A > B then C = A. C = A x B

Simulation of the unsigned problem  $C = 25 \times 50$ , where the answer should equal 1250 (0x04E2).

<pre>reset: ;Initialize SRM Variables clr r16 sts A, r16 sts B, r16 sts C, r16 sts C+1, r16 loop:</pre>	Watch								
	Name	Value	Туре	Location					
	A	0x19 '¦'	SRAM Location	0x0100 [SR					
	В	0x00 ''	SRAM Location	0x0101 [SR					
	С	0x00 ''	SRAM Location	0x0102 [SR					
	Memory								
<pre>; Test Max1 ldi r16, 0x19 sts A, r16 ldi r16, 0x32 sts B, r16 rcall Mu18x8_16 rjmp loop</pre>	Data 🔹 8/16 abc. Address: 0x100								
	000100 19 00 00		00 00 00						
	00010A 00 00 00 000114 00 00 00		00 00 00 00 00 00	=					
	00011E 00 00 00 000128 00 00 00			-					

Figure 1: Start of program with variable A initialized to 0x19 (25<sub>10</sub>)

reset:	
;Initialize SRM Variables	8
clr r16	
sts A, r16	
sts B, r16	
sts C, r16	
sts C+1, r16	
loop:	
; Test Max1	
ldi r16, Ox19	
sts A, r16	
ldi r16, 0x32	
sts B, r16	
➡ rcall Mul8x8_16	
rjmp loop	

Watch														×
Name Value					1	Гур	е	Location						
A				0 <b>x</b> 1	0x19 '¦'				RAM	Loc	0x0100	[SR		
В				0 <b>x</b> 3	0x32 '2'			SI	RAM	Loc	0x0101	[SR		
С				0x00 ''			SI	SRAM Location				0x0102	[SR	
Memory								×						
Data					•	{	3/16		abc	:	Address:	0×1	00	
000100	19	32	00	00	00	00	00	00	00	00	.2			
00010A	00	00	00	00	00	00	00	00	00	00				=
000114	00	00	00	00	00	00	00	00	00	00		••		
00011E		00	00		00	00			00		•••••	••		_
000128	00	00	00	00	00	00	00	00	00	00		•••		Ψ.

Figure 2: variable B is initialized to 0x32 (50<sub>10</sub>)

reset: :Initialize SRM Variables	Watch								
clr r16 sts A, r16 sts B, r16	Name		Value	Туре	Location				
	Α	C	0x19 '¦'	SRAM Location	0x0100 [SR				
	В	0	0x32 '2'	SRAM Location	0x0101 [SR				
sts C, r16	С	0	OxE2 'â'	SRAM Location	0x0102 [SR				
sts C+1, r16 loop:	Memory	,			×				
<pre>; Test Max1</pre>	Data		▼ 8/1	6 abc. Address: 0x	100				
			04 00 00 00						
	00010A 00 000114 00				=				
	00011E 00 000128 00				-				

Figure 3: End of program with variable C containing 0x04E2 (32<sub>10</sub>). Byte ordering is little endian.