

Unsigned 8-bit Division

Write a function named Div8 to divide an unsigned 16 bit number by an unsigned 8 bit number. Test your function by writing a program named Div8_test to test the subroutine Div8 by dividing the 16-bit-number: 0xAAAA by the 8-bit-number 0x55.

In this solution, I am defining registers r5 to r0, as QH, QL, DIV, NH, and NL respectively. Where Q stands for Quotient (the output), DIV is the divisor (the denominator), and N stands for the Numerator (the divisor). No SRAM variables are used in this solution

```

.DEF QH = r5 ; MSB
Div8_test:
  ldi r16, 0xAA ;
  mov NH, r16
  mov NL, r16
  ldi r16, 0x55 ;
  mov DIV, r16
  rcall Div8
  rjmp Div8_test

```

Name	Value	Type	Location
NL	0x00 ''	Register	R0
NH	0x00 ''	Register	R1
DIV	0x00 ''	Register	R3
QL	0x00 ''	Register	R4
QH	0x00 ''	Register	R5

Figure 1 Start of unsigned 8-bit Division test program with all registers cleared (reset condition).

```

.DEF QH = r5 ; MSB
Div8_test:
  ldi r16, 0xAA ;
  mov NH, r16
  mov NL, r16
  ldi r16, 0x55 ;
  mov DIV, r16
  rcall Div8
  rjmp Div8_test

```

Name	Value	Type	Location
NL	0xAA ''	Register	R0
NH	0xAA ''	Register	R1
DIV	0x55 'U'	Register	R3
QL	0x00 ''	Register	R4
QH	0x00 ''	Register	R5

Figure 2 Just before call to Div8, with N = 0xAAAA (43,690₁₀) and DIV = 0x55 (85₁₀).

```

.DEF QH = r5 ; MSB
Div8_test:
  ldi r16, 0xAA ;
  mov NH, r16
  mov NL, r16
  ldi r16, 0x55 ;
  mov DIV, r16
  rcall Div8
  rjmp Div8_test

```

Name	Value	Type	Location
NL	0xAA ''	Register	R0
NH	0xAA ''	Register	R1
DIV	0x55 'U'	Register	R3
QL	0x02 '7'	Register	R4
QH	0x02 '7'	Register	R5

Figure 3 End of unsigned 8-bit Division test program with Q containing 0x0202 (514₁₀).