

# Unsigned 8-bit Average of 3 numbers

Given variables A, B, and C; each holding an 8-bit unsigned number. Write a program to find the average of A to C, placing the result into variable D.

$$D = A + B + C / 3$$

Allow for a 16-bit interim sum and result.

**AvgABC:**

```

clr r1
lds r0,A
clr r3
lds r2,B
clr r5
lds r4,C

add r0,r2
adc r1,r3
add r0,r4
adc r1,r5

```

Name	Value	Type	Location
A	0x34 '4'	SRAM Locat:	0x0100 [SRAM]
B	0x78 'x'	SRAM Locat:	0x0101 [SRAM]
C	0xBC 'x'	SRAM Locat:	0x0102 [SRAM]
D	0x00 ''	SRAM Locat:	0x0103 [SRAM]

**Memory**

Data 8/16 abc Address: 0x100

000100 34 78 BC 00 00 00 00 00 00 00 00 00 00

Figure 1 Start of unsigned 8-bit Average program with variable A initialized to 0x34 ( $52_{10}$ ), B initialized to 0x78 ( $120_{10}$ ) and C initialized to 0xBC ( $188_{10}$ ).

```

add r0,r4
adc r1,r5

ldi r16,3
mov r3,r16
rcall Div8

sts D,r4
rjmp AvgABC

```

Name	Value	Type	Location
A	0x34 '4'	SRAM Locat:	0x0100 [SRAM]
B	0x78 'x'	SRAM Locat:	0x0101 [SRAM]
C	0xBC 'x'	SRAM Locat:	0x0102 [SRAM]
D	0x78 'x'	SRAM Locat:	0x0103 [SRAM]

**Memory**

Data 8/16 abc Address: 0x100

000100 34 78 BC 78 00 00 00 00 00 00 00 00 00

```

/* Div8
 * Q = N/D Divide
 * input
 * N = Numerator:

```

Figure 2 End of unsigned 8-bit Average program with variable D containing 0x78 ( $120_{10}$ ).