B9	E8	R_3//	R_1R_2

ADD (**AGRK**) is used to add two 64-bit signed, 2's complement, binary fields stored in grande registers, and produces a signed 64-bit sum that is stored in a grande register. Specifically, the second operand, R_2, is added to the third operand R_3. And the result stored in the first operand, R_1.The second and third operands are unchanged by this operation.

This instruction sets the condition code as indicated below:

0 Result zero; no overflow
1 Result less than zero; no overflow
2 Result greater than zero; no overlow
3 Overflow

If the fixed-point-overflow mask is one (see SPM), a program interruption for fixed-point overflow occurs.
If the fixed-point-overflow mask is zero, a program interruption for fixed-point overflow will not occur, and it is the responsibility of the programmer to make sure no overflow occurs.

The sign of the sum is determined by the usual rules of arithmetic. The only exception is that a zero result always has a positive sign.

Consider the following example, AGRK R4,R8,R9 in which we add 5 + 10 = 15.

Before the addition:

R4 (Ignored)

11	22	33	44	55	66	77	88

R8 (Addend)

00	00	00	00	00	00	00	05

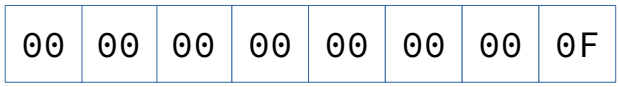
R9 (Augend)

00	00	00	00	00	00	00	0A

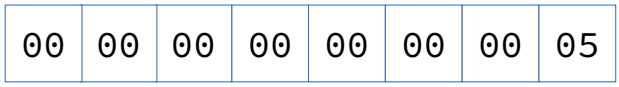
AGRK R4,R8,R9

After the addition:

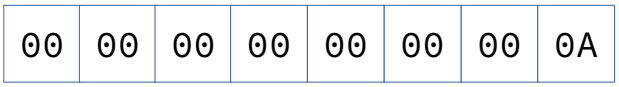
R4 (Sum)



R8 (Addend)



R9 (Augend)



The condition code is set to 2 by this operation.

Examples

Some Unrelated AGRKs **UNDERSCORE _ FOR READABILITY**

```
R4 =  X'12121212_12121212'         IGNORED
R5 =  X'00000000_00000008'         IGNORED
R6 =  X'FFFFFFFF_FFFFFFFF'         -1
R7 =  X'00000000_00000010'         16
```

AGRK R4,R6,R7

After Addition: The condition code is set to 2 by this operation.

```
R4 =  X'00000000_0000000F'     R4 = 15 the sum
R5 =  X'00000000_00000008'     R5 does not participate
R6 =  X'FFFFFFFF_FFFFFFFF'     R6 = -1 unchanged
R7 =  X'00000000_00000010'     R7 = 16 unchanged
```

Before Addition:

```
R5 =  X'00000000_00000008'         IGNORED
R6 =  X'FFFFFFFF_FFFFFFFF'         -1
R7 =  X'00000000_00000010'         16
R8 =  X'00000000_000003FC'       1020
```

MGRK R6,R5,R8

After Addition: The condition code is set to 2 by this operation.

```
R5 =  X'00000000_00000008'     R5 =    8 unchanged
R6 =  X'00000000_OOOOO404'     R6 = 1028 the sum
R7 =  X'00000000_00001FE0'     R7 does not participate
R8 =  X'00000000_000003FC'     r8 = 1020 unchanged
```

Tips

1) The range of sums is -9,223,372,036,854,775,808 to +9,223,372,036,854,775,807.