

3.4.3.1. STATUS FLAGS

The status flags (bits 0, 2, 4, 6, 7, and 11) of the EFLAGS register indicate the results of arithmetic instructions, such as the ADD, SUB, MUL, and DIV instructions. The functions of the status flags are as follows:

CF (bit 0)	Carry flag. Set if an arithmetic operation generates a carry or a borrow out of the most-significant bit of the result; cleared otherwise. This flag indicates an overflow condition for unsigned-integer arithmetic. It is also used in multiple-precision arithmetic.
PF (bit 2)	Parity flag. Set if the least-significant byte of the result contains an even number of 1 bits; cleared otherwise.
AF (bit 4)	Adjust flag. Set if an arithmetic operation generates a carry or a borrow out of bit 3 of the result; cleared otherwise. This flag is used in binary-coded decimal (BCD) arithmetic.
ZF (bit 6)	Zero flag. Set if the result is zero; cleared otherwise.
SF (bit 7)	Sign flag. Set equal to the most-significant bit of the result, which is the sign bit of a signed integer. (0 indicates a positive value and 1 indicates a negative value.)
OF (bit 11)	Overflow flag. Set if the integer result is too large a positive number or too small a negative number (excluding the sign-bit) to fit in the destination operand; cleared otherwise. This flag indicates an overflow condition for signed-integer (two's complement) arithmetic.

Of these status flags, only the CF flag can be modified directly, using the STC, CLC, and CMC instructions. Also the bit instructions (BT, BTS, BTR, and BTC) copy a specified bit into the CF flag.

The status flags allow a single arithmetic operation to produce results for three different data types: unsigned integers, signed integers, and BCD integers. If the result of an arithmetic operation is treated as an unsigned integer, the CF flag indicates an out-of-range condition (carry or a borrow); if treated as a signed integer (two's complement number), the OF flag indicates a carry or borrow; and if treated as a BCD digit, the AF flag indicates a carry or borrow. The SF flag indicates the sign of a signed integer. The ZF flag indicates either a signed- or an unsigned-integer zero.

When performing multiple-precision arithmetic on integers, the CF flag is used in conjunction with the add with carry (ADC) and subtract with borrow (SBB) instructions to propagate a carry or borrow from one computation to the next.

The condition instructions Jcc (jump on condition code *cc*), SETcc (byte set on condition code *cc*), LOOPcc, and CMOVcc (conditional move) use one or more of the status flags as condition codes and test them for branch, set-byte, or end-loop conditions.