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Macintosh: Maximum Number of Digits

A customer asks: "What is the largest number of digits that can be represented in a number on the Macintosh?" The answer depends on what is meant by "digits."

Binary Digits

The maximum number of binary digits is 63. A number this large can be achieved with both the comp data type and the extended data type. In the case of the extended data type, a 15-bit exponent is part of the number.

Decimal Numbers

The maximum representable number in the extended data type is $2^{\text{exponent}} (16383) * (1.1 \text{ recurring } 63 \text{ times}) = 1.1\text{E}4932$. This number is 4,933 decimal digits long.

In terms of numbers not represented in a floating point extended data type, but one of the other data types, then the maximum decimal digit is $2^{\text{exponent } 63}$, approximately equalling $9.2\text{E}18$, which is 19 decimal digits.

For More Information

See the "Apple Numerics Manual: Standard Apple Numeric Environment," (copyright 1986, ISBN 0-201-17741-2) page 14.

Note: programming languages may further limit the data types available to the programmer.

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