Value Encyclopedia Article

Value

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Value

With regards to computing, the term value is a quantity assigned to an element such as a **variable**, field, symbol, or label. The quantity involving a particular value can refer to (and be assigned to) alphabetic as well as numeric **data**.

Values within computers can be represented as alphabetic data, numeric data, or a combination of alphabetic and numeric data (commonly called alphanumeric data). Alphabetic data includes letters, control characters, punctuation marks, space characters, and other common symbols as well as the codes used to represent them.

Numeric data refers to numbers; more specifically numbers expressed in integer notation, fixed-point notation, and floating-point notation. Integer notation is a numeric format consisting of positive and negative whole numbers, such as 45, -87, and 125,953. Calculations involving integers are much faster than calculations involving floating-point numbers. As a result, integers are widely used in **programming** for purposes of counting and numbering. Fixed-point notation is a numeric format in which the decimal point has a specified position. Examples of fixed-point numbers with two digits to the left of the decimal point and one digit to the right are 48.5, -94.3, and 00.0. Floating-point notation, also called exponential notation, is a numeric format that is used to easily and efficiently represent very large and very small real numbers. This type of notation is stored in two parts, a mantisssa and an exponent. The mantissa consists of the significant digits in the number, and the exponent specifies the magnitude of the number (the position of the decimal point). For example, the number 532,000,000 can be expressed as 532E6 (commonly called "scientific floating-point notation"); that is, 532 with six zeroes to its right side. Used in a computer, the base for floating-point numbers is usually 2. Many microprocessors support **floating-point arithmetic**. For example, **Intel** Corporation's line of Pentium® microprocessors contains built-in math-coprocessors, also called FPUs, or Floating Point Units.

Alphanumeric data includes a combination of alphabetic and numeric data that was discussed earlier. The grouping of alphanumeric characters that have some relationship to one another is called a **character set**.

The general definition of value is fundamentally important to the precise set of mathematical rules for representing the interactions and relationships among words, numbers, symbols, and other data entered and stored in the **memory** of a computer. This set of rules is called **digital logic**, and is the basis for all operations within modern digital computers.