Speedy 33 (Signal Processing educational engineering device for youth) is a board that contains a DSP chip. We manipulate this board by connecting it to a computer. Thus, we can make some operations and analyze inputs in order to get a certain output.

 One of the uses of this board is analyzing sounds. We can find an Audio Stereo Input port and an Audio Stereo Output port and many other elements that facilitate this operation. The data analyzed via computer should be digital. In fact, the computer analyses and represents information using bits. A bit can be represented by 2 symbols: 0(zero) and 1 (one). We can use also this to represent a truth value where 0 refers to false and 1 to true.

Let’s go back to our Speedy-33. The data input in the board is analog. The signal has continuous values. Here comes the role of the board and also an essential mathematical logic: the board contains an audio Interface controller. It translates continuous values of the signal to discrete digital values. The program installed on the DSP specifies sets of frequencies and its equivalent in the bit language. For example, an analog signal input with a frequency of 10 Hz can be classed in the set of signals with frequencies between 10 and 15Hz. This set would be represented by two digits 01. Thus this frequency will be translated in 01. Another frequency, who belongs to another set, would translate in a different way. Therefore, the analog input converted in a digital one with “0” and “1” will be analyzed by the computer. We call the result a digital string or sequence of zeros or more bits. The length of this string would vary depending on the program used and the received information.

After being analyzed, this digital data can be retranslated to an analog one. Here, the mathematical logic, the bit operation, has served to represent information and facilitates the analysis of data. In other places, it would correspond to logical connectives. Moreover, OR, AND, and XOR are logic operators used in many programming languages like in browsing the internet.

Reference:

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