Describes any system based on discontinuous data or events. Computers are digital machines because at their most basic level they can distinguish between just two values, 0 and 1, or off and on. There is no simple way to represent all the values in between, such as 0.25. All data that a computer processes must be encoded digitally, as a series of zeroes and ones. The opposite of digital is analog. A typical analog device is a clock in which the hands move continuously around the face. Such a clock is capable of indicating every possible time of day. In contrast, a digital clock is capable of representing only a finite number of times (every tenth of a second, for example). In general, humans experience the world analogically. Vision, for example, is an analog experience because we perceive infinitely smooth gradations of shapes and colors. Most analog events, however, can be simulated digitally. Photographs in newspapers, for instance, consist of an array of dots that are either black or white. From afar, the viewer does not see the dots (the digital form), but only lines and shading, which appear to be continuous. Although digital representations are approximations of analog events, they are useful because they are relatively easy to store and manipulate electronically. The trick is in converting from analog to digital, and back again. This is the principle behind compact discs (CDs). The music itself exists in an analog form, as waves in the air, but these sounds are then translated into a digital form that is encoded onto the disk. When you play a compact disc, the CD player reads the digital data, translates it back into its original analog form, and sends it to the amplifier and eventually the speakers. Internally, computers are digital because they consist of discrete units called bits that are either on or off. But by combining many bits in complex ways, computers simulate analog events. In one sense, this is what computer science is all about.

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