



E

ELECTROSTATIC PRINTER

Electrostatic is a term that is often used as a synonym for 'electrosensitive', but it is better employed as a description of so-called 'laser' printers that are used in large computing installations. A laser printer is really a modified electrostatic photocopier. An electrostatic charge is applied evenly to the surface of a smooth zinc drum, and then scanned by a laser beam, which is switched on and off by the computer. Where the surface is exposed to the laser beam, the charge is neutralised. After the drum has been scanned, a sheet of paper is passed over it and acquires the electrical image. The paper is then covered in fine carbon powder. The carbon sticks only to the charged areas, and is then baked on by a heating element, producing an 'electronic painting' of the image to be printed. Laser printers can produce an entire A4 sheet of printing in a few seconds, irrespective of the amount of text on the page. These devices are falling in cost, but the cheapest is still around £5,000. Full-colour laser printers are expected to appear on the market soon.

EMULATOR

An *emulator* is a computer system that mimics the characteristics of another computer. Micro-computer software, for example, is often developed on a mainframe to take advantage of the larger system's greater storage capacity and better debugging facilities. If, for example, Spectrum software is being developed, a Spectrum emulator must be written for the mainframe, which then behaves exactly like a Spectrum microcomputer.

ENIAC

An acronym for Electronic Numerical Integrator And Computer. ENIAC was designed by John J Mauchly and J Presper Eckert Jr at the University of Pennsylvania during the years 1943-1946. It was a general purpose electronic calculator that used vacuum tubes (valves) as relays. ENIAC was originally designed to help with the creation of ballistics tables during the Second World War,

ENIAC

This computer, for all its ponderous construction and the massive power drain of its vacuum tube logic, brought computing out of the preserve of electromechanics and into the electronic age

although it was not completed until the war was over. Because of its immense size and the amount of heat generated by the electronic circuits, ENIAC had to be housed in a large, air-conditioned room.

EOF

The *End Of File* indicator is a control character that is embedded at the end of a file of data to instruct the operating system to stop searching. It is mandatory on a cassette-based system, but is seldom used on disks because the directory file keeps a record of the length of all disk files.

ERGONOMICS

The science of designing machines to fit in with human beings, taking into account our physical and psychological attributes, is called *ergonomics*. Physical characteristics are considered when the external features of the system are designed — ergonomics is responsible for developments like detachable keyboards, adjustable screens, high-definition monitors, etc. Psychological considerations have led to an awareness of concepts such as 'user-friendliness', which is a term that indicates a particular program has been designed to cater for as many eventualities as possible.

EXCLUSIVE-OR

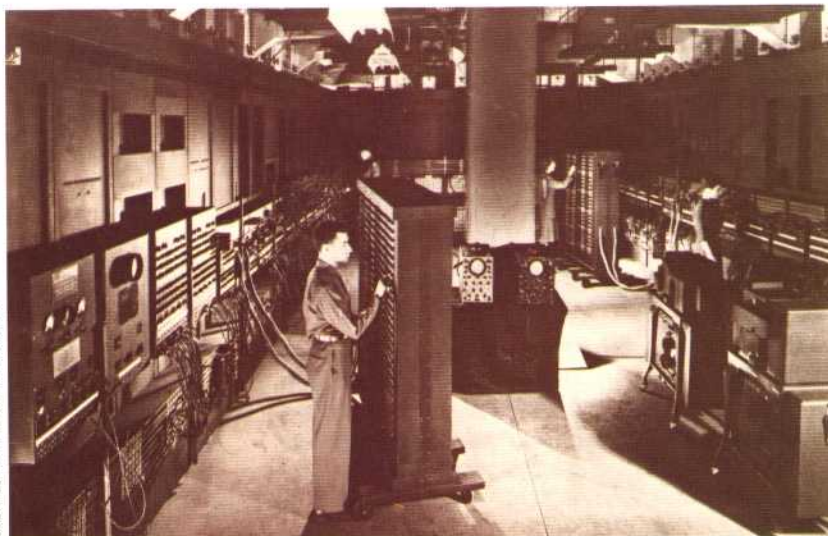
The Exclusive-OR operation is one of the fundamental building blocks of Boolean algebra. The operation requires two input bits and one output. The output is 1 if either of the inputs is 1, but is 0 if both inputs are 0 or both inputs are 1. The Exclusive-OR operation may therefore be thought of as a difference tester — the output will always be true (1) if the inputs are different. An Exclusive-OR gate may be constructed from two AND gates, two inverters and an OR gate. Its operation can be considered as:

$$\text{Output} = (A \text{ AND NOT } B) \text{ OR } (B \text{ AND NOT } A)$$

Exclusive-OR is also available as a single operand in many microprocessors. It compares the contents of the accumulator with another specified byte, giving a 1 for each bit position where the two bytes differ.

EXPERT SYSTEMS

Computer programs written for very specific applications that previously required the presence of experts are called *expert systems*. In an expert system, the computer terminal acts as a temporary substitute for an experienced person. The expert system takes over detailed tasks and frees the human's time for more productive activity, or allows someone to be assisted at the times when a human expert cannot be available. Expert systems can be used for medical diagnosis, the detection of problems in mechanical and electronic systems, geological engineering, and computer-aided design.



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