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reuse a disk that already contains programs or data, effectively destroying the existing contents.

refresh *vb.* **1.** To retrace a video screen at frequent intervals, even if the image does not change, so as to keep the phosphors irradiated. **2.** To recharge dynamic random access memory chips (DRAMs) so that they continue to retain the information stored in them. Circuitry on the memory board automatically performs this function. *See also* refresh cycle.

refreshable *adj.* In programming, referring to a program module capable of being replaced in memory without affecting processing of the program or the information being used by the program.

refresh cycle *n.* The process in which controller circuitry provides repeated electric pulses to dynamic random access memory chips in order to renew the stored electric charges in those locations that contain binary 1. Each pulse is one refresh cycle. Without constant refreshing, dynamic semiconductor RAM loses any information stored in it—as it does when the computer is turned off or when the power fails. *See also* dynamic RAM, static RAM.

refresh rate *n.* In reference to video hardware, the frequency with which the entire screen is redrawn to maintain a constant, flicker-free image. On TV screens and raster-scan monitors, the electron beam that lights the phosphor coating on the inner surface of the screen typically refreshes the entire image area at a rate of about 60 hertz, or 60 times per second. Interlaced monitors, which redraw alternate lines during each sweep of the electron beam, actually refresh any particular line only 30 times per second. Because odd and even lines are refreshed on successive sweeps, however, the effective refresh rate is 60 times per second. *See also* refresh (definition 1).

REGEDIT *n. See* Registry Editor.

regenerate *vb. See* rewrite.

regeneration buffer *n. See* video buffer.

regenerator *n. See* repeater.

region *n.* **1.** An area dedicated to or reserved for a particular purpose. **2.** In video programming, a contiguous group of pixels that are treated as a unit. On the Apple Macintosh, for example, a region is an area in a grafPort that can be defined and manipulated as an entity. The visible working area within a window is an example of a region. *See also* grafPort.

region code *n.* Codes on DVD movie titles and DVD-ROM drives that prevent playback of certain DVDs in certain geographical regions. Region codes are part of the DVD specification. *See also* CSS, DeCSS.

region fill *n.* In computer graphics, the technique of filling a defined region on the screen with a selected color, pattern, or other attribute. *See also* region (definition 2).

register *n.* A set of bits of high-speed memory within a microprocessor or other electronic device, used to hold data for a particular purpose. Each register in a central processing unit is referred to in assembly language programs by a name such as *AX* (the register that contains the results of arithmetic operations in an Intel 80x86 processor) or *SP* (the register that contains the memory address of the top of the stack in various processors).

registered file type *n.* File types that are tracked by the system registry and are recognized by the programs you have installed on your computer. *See also* file type.

registration *n.* The process of precisely aligning elements or superimposing layers in a document or a graphic so that everything will print in the correct relative position. *See also* registration marks.

registration marks *n.* Marks placed on a page so that in printing, the elements or layers in a document can be arranged correctly with respect to each other. Each element to be assembled contains its own registration marks; when the marks are precisely superimposed, the elements are in the correct position. See the illustration.

Registration marks.

registry *n.* A central hierarchical database in Windows 9x, Windows CE, Windows NT, and Windows 2000 used to store information necessary to configure the system for one or more users, applications, and hardware devices. The Registry contains information that Windows continually references during operation, such as profiles for each user, the applications installed on the computer and the types of documents each can create, property sheet settings for folders and application icons, what hardware exists on the system, and which ports are being used. The Registry replaces most of the text-based .ini files used in Windows 3.*x* and MS-DOS configuration files, such as AUTOEXEC.BAT and CONFIG.SYS. Although the Registry is common to the several Windows platforms, there

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are some differences among them. *Also called:* system registry. *See also* hierarchical database, .ini, input/output port, property sheet, Registry Editor.

Registry Editor *n.* An application under Windows that allows the user to edit the entries in the registry. *Acronym:* REGEDIT. *See also* registry.

regression analysis *n.* In statistics, an analysis of the degree to which variations in an independent variable affect a dependent variable (a variable whose value depends on the value of another variable). *See also* multiple regression.

regression testing *n.* Complete retesting of a modified program, rather than a test of only the modified routines, to ensure that no errors have been introduced with the modifications.

relation *n.* A structure composed of attributes (individual characteristics, such as name or address, corresponding to the columns in a table) and tuples (sets of attribute values describing particular entities, such as customers, corresponding to the rows in a table). Within a relation, tuples cannot be repeated; each must be unique. Further, tuples are unordered within a relation; interchanging two tuples does not change the relation. Finally, if relational theory is to be applicable, the domain of each attribute must be atomic—that is, a simple value, rather than a structure such as an array or a record. A relation in which the domains of all attributes are atomic is said to be normalized or in first normal form. *See also* normal form (definition 1).

relational algebra *n.* A collection of rules and operators that permits relations (tables) to be manipulated. Relational algebra is usually described as having the following operators: SELECT, PROJECT, PRODUCT, UNION, INTERSECT, DIFFERENCE, JOIN (or INNER JOIN), and DIVIDE. In a relational database, relational algebra is used to develop procedures to build new relations based on the existing relations.

relational calculus *n.* In database management, a nonprocedural method for manipulating relations (tables). There are two families of relational calculus: domain calculus and tuple calculus. The two families of relational calculus are mathematically equivalent to each other and to relational algebra. Using either family, one can formulate a description of a desired relation, based on the existing relations in the database.

relational database *n.* A database or database management system that stores information in tables—rows and columns of data—and conducts searches by using data in specified columns of one table to find additional data in another table. In a relational database, the rows of a table represent records (collections of information about separate items) and the columns represent fields (particular attributes of a record). In conducting searches, a relational database matches information from a field in one table with information in a corresponding field of another table to produce a third table that combines requested data from both tables. For example, if one table contains the fields EMPLOYEE-ID, LAST-NAME, FIRST-NAME, and HIRE-DATE, and another contains the fields DEPT, EMPLOYEE-ID, and SALARY, a relational database can match the EMPLOYEE-ID fields in the two tables to find such information as the names of all employees earning a certain salary or the departments of all employees hired after a certain date. In other words, a relational database uses matching values in two tables to relate information in one to information in the other. Microcomputer database products typically are relational databases. *Compare* flat-file database, inverted-list database.

relational database management system *n. See* relational database.

relational expression *n.* An expression that uses a relational operator such as "less than" or "greater than" to compare two or more expressions. A relational expression resolves to a Boolean (true/false) value. *See also* Boolean, relational operator.

relational model *n.* A data model in which the data is organized in relations (tables). This is the model implemented in most modern database management systems.

relational operator *n.* An operator that allows the programmer to compare two (or more) values or expressions. Typical relational operators are greater than (>), equal to (=), less than (<), not equal to (<>), greater than or equal to (>=), and less than or equal to (<=). *See also* relational expression.

relational structure *n.* The record organization used in the implementation of a relational model.

relative address *n.* A location, as in a computer's memory, that is specified in terms of its distance (displacement or offset) from a starting point (base address). A relative

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