INDEX

The word *index* has several different definitions in computing. The first refers to a number or item of data in a list that indicates where a piece of information can be located. For example, a BASIC array contains a number of different elements, and each of these can be separately accessed by selecting a number associated with that element. This number is referred to as 'the index'. In machine code, an index is a number held in an *index register*. This index is the number that must be added to a particular address, which then points to another address — the contents of which are to be modified. This method of addressing is used for processing arrays.

INDEXED FILE

As its name implies, an *indexed file* is simply a file whose organisation is dependent on an index. Indexed files may be organised so that the index is separated from the file itself — as in a book index. In computing, this type of indexed file may be found on a floppy disk, on which a specific track is set aside for the directory of the disk's contents. Each time the disk is accessed the directory is examined to discover the required file's location.

A common and important file type is the *indexed sequential file*. Here, a sequential file is stored in sorted order, and an index file is created from it, consisting of the sort key field from each record of the original file, in the sorted order. Records are located by searching the index file for the desired key field; its position in the index is the same as the parent record's position in the sequential file. This can now be accessed reasonably quickly by skipping the appropriate number of records from the start of the file. The technique was first developed for mainframe tape-based systems in which the whole index file could usually be held and searched quickly in memory; the parent file would generally contain too many lengthy records to fit into available memory.

INDEX REGISTER

An *index register* is an area set aside within the central processing unit (CPU) of a microcomputer for the storage of the index currently being used by the program. This is particularly useful for 'indexed addressing'. In this method of addressing, the number held in the index register is added to the address specified in the instruction, and the sum of the two numbers is the address to be accessed by the computer. For example, the instruction LDA BASE,X will LoaD the Accumulator with the contents of the address whose value is equal to BASE + the contents of register X.

This technique is mostly used to access a table of numbers (an array). A number of instructions, or op-codes, are set aside specifically to manipulate the numbers held within index registers. An index register may also be used as a general-purpose register. This means that the register can be used by the programmer as a short-term storage device for numbers. Used in this way, an index register can cut both memory use and processing time appreciably. The alternative is to have the processor store the number in RAM — a process that is time-consuming and occupies valuable memory space.

INFORMATION HIDING

Information hiding is a concept relating to structured programming. The principle behind this method of programming is that a program should be constructed of individual modules that are self-contained, and which can easily be understood and modified. Furthermore, the information and decisions taken within a module should, as far as possible, be exclusive to that module. This is known as 'information hiding' because the information or decision is 'hidden' from the rest of the program. This concept was first developed by David Parnas, who proposed that all modules within a program should ideally contain only one decision.

INFORMATION MANAGEMENT SYSTEM

An *information management system* is designed to deal with the organisation of information within a system. It is often used with databases, which are themselves ways of organising data. The information must be stored in such a way as to allow fast and easy access by the user. This means that the system must not only be able to store the information but must also maintain an index system to allow that information to be retrieved efficiently. However, an information management system is more than simply the location, storage, retrieval and cataloguing of data. Although databases are within the field of IMS, the term is more broadly based, encompassing such features as the computer's operating system and memory management, as well as other programs in which data is constantly being changed and updated. IMS, combined with distributed processing, is the most important influence on data processing.

Index Linked
The index file consists of the key fields of the data records, sorted in the same order as the main file. A record is located by searching the index file for the key and then skipping the appropriate number of records in the main file. Records are deleted temporarily by marking them in the index file; from time to time the main file will be re-sorted to take account of changes, and the deleted records will then be permanently removed

Key	No.
Andrews	1
Baker	2
Brown	3
Cressy	4
Davids	5
Dawes	6
Fish	7
Gregory	8
Haynes	9
Johns	10
Klaus	11
Marks	12

Index File

Main File

	Name	Work Tel.	Home Tel.	Job Title
1	Andrews	342 0791	727 0942	Designer
2	Deleted Record			
3	Brown	729 8213	236 2190	Dentist
4	Deleted Record			
5	Davids	743 7216	450 6926	Gardener
6	Dawes	736 7700	693 0452	Engineer
7	Fish	225 9721	511 2983	Decorator
8	Gregory	621 3900	386 2222	Hairdresser
9	Haynes	833 2971	534 6312	Nurse
10	Johns	421 2253	930 7814	Plumber
11	Klaus	493 9899	455 8341	Lawyer
12	Marks	730 6321	429 7592	Mechanic

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