MODULE 5

SECONDARY STORAGE STRUCTURES

OVERVIEW OF MASS-STORAGE STRUCTURE

Magnetic Disks

- Magnetic disks provide the bulk of secondary storage for modern computer systems.
- Each disk platter has a flat circular shape, like a CD. Common platter diameters range from 1.8 to 5.25 inches.
- The two surfaces of a platter are covered with a magnetic material. The information stored by recording it magnetically on the platters.

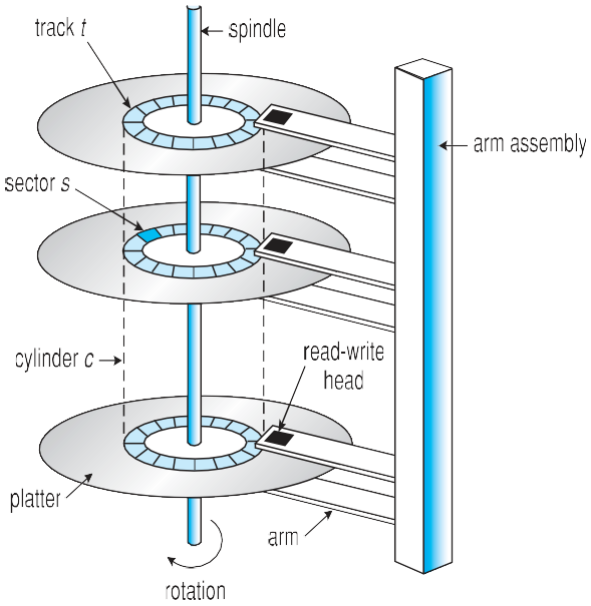

Figure: Moving-head disk mechanism

- The surface of a platter is logically divided into circular tracks, which are subdivided into sectors. Sector is the basic unit of storage. The set of tracks that are at one arm position makes up a cylinder.
- The number of cylinders in the disk drive equals the number of tracks in each platter.
- There may be thousands of concentric cylinders in a disk drive, and each track may contain hundreds of sectors.

FILE CONCEPT

FILE:

- *A* file is a named collection of related information that is recorded on secondary storage.
- The information in a file is defined by its creator. Many different types of information may be stored in a file source programs, object programs, executable programs, numeric data, text, payroll records, graphic images, sound recordings, and so on.

A file has a certain defined which depends on its type.

- *A text* file is a sequence of characters organized into lines.
- *A source* file is a sequence of subroutines and functions, each of which is further organized as declarations followed by executable statements.
- An *object* file is a sequence of bytes organized into blocks understandable by the system's linker.
- An *executable* file is a series of code sections that the loader can bring into memory and execute.

File Attributes

- A file is named, for the convenience of its human users, and is referred to by its name. A name is usually a string of characters, such as *example*.c
- When a file is named, it becomes independent of the process, the user, and even the system that created it.

A file's attributes vary from one operating system to another but typically consist of these:

- **Name:** The symbolic file name is the only information kept in human readable form.
- **Identifier:** This unique tag, usually a number, identifies the file within the file system; it is the non-human-readable name for the file.
- **Type:** This information is needed for systems that support different types of files.
- **Location:** This information is a pointer to a device and to the location of the file on that device.
- **Size:** The current size of the file (in bytes, words, or blocks) and possibly the maximum allowed size are included in this attribute.
- **Protection:** Access-control information determines who can do reading, writing, executing, and so on.
- **Time, date, and user identification:** This information may be kept for creation, last modification, and last use. These data can be useful for protection, security, and usage monitoring.