INTRODUCTION
TO MS-DOS

An **operating system** is an organizedd set or collection of software programs that controls the overall operation of the computer system. It controls and directs the flow of data and instruction from one part of the computer to another. As you already know, a computer is nothing but a collection of various hardware devices such as the keyboard, the visual display unit (VDU), the central processing unit (CPU), etc. It is the operating system (OS) that makes these independent hardware devices a single entity and easy to use and manage.

MS-DOS stands for Micro Soft Disk Operating System. It was developed by Microsoft Corporation for the IBM-PC.

Memory is the circuitry in a computer that stores information. The two types of memory available are the **RAM** (Random Access Memory) and **ROM** (Read only Memory). RAM is that part of the computer's memory to which we have access. It stores programs and data when the computer is on. ROM is the section of memory that you can only read from. This stores the basic computer operating system and system routines.

ROM plays a major role in the operation of IBM-PCs. The ROM in any IBM-PC or its compatible, consists of two different types of programs.

Initializing or Loading Routines

These routines first test the system and each of the peripheral devices, initialize various components and make sure that the devices that are necessary for running the system are present and operational. Then these programs search the disks for the OS routines and programs. Once the OS routines and programs are found, ROM loading routines load the OS routines into the main memory and then pass the control over to the operating system. This process of loading the OS is called **Booting**.

The ROM-BIOS (Basic Input Output System)

The ROM-BIOS routines provide the fundamental services that are needed by the OS and the programs. They are used for controlling the peripheral devices, reading/writing data to and from the disks, displaying data on the screen, etc. These routines are used by each and every program.

When the computer is powered on, after ROM BIOS completes its equipment check routines, ie, POST (Power On Self Test), and assuming all is well, ROM BIOS reads the first sector of the disk. The disk bootstrap program is found on the first sector of every MS-

DOS diskette, and on the first sector of the partition allocated to MS-DOS on a hard disk. ROM BIOS takes the disk bootstrap program to memory and executes it. The bootstrap program then loads the Basic Input Output interface software (IO.SYS) into memory. If it recognizes the IO.SYS file, it continues from there to read the file MSDOS.SYS. If it does not recognize the IO.SYS file, it displays a message saying that the disk is not a system disk, and asks you to load another, then press any key to continue.

Most of the DOS programs are stored in two files, namely **IO.SYS** and **MSDOS.SYS**. Another file which contains DOS routines is the COMMAND.COM. The IO.SYS and MSDOS.SYS are hidden files and are not visible to the user. COMMAND.COM is the command processor. It is the program that sends the system prompt to the display and looks and interprets the characters typed at the keyboard.

INTERNAL AND EXTERNAL COMMANDS

Internal commands are commands that are a part of the MS-DOS command interpreter. They are small routines and are stored within the COMMAND. COM file.

External commands are not a part of COMMAND.COM. They are stored on a separate disk.

COMMAND.COM contains a table which has the names of all the internal commands stored in it. After accepting a command, it searches that table for the command just entered. If found, the command is an internal command and its code from the COMMAND.COM file will be executed. If the name of the command just entered is not present in the table, the command is an external command. Hence, it searches for the command on the disk and upon finding it, the command interpreter loads it into the memory and executes it. Otherwise a message "Bad command or file name" is displayed.

Internal Commands

All the file names used in internal commands can be preceded by a drive name and a path which are indicatied by the following terms.

d:- drive, sd:- source drive, td:- target drive, cd:- current directory

Clearing the screen—CLS

This command erases all the characters on the screen and takes the cursor control to the first row of the screen.

Syntax: CLS

Entering the current date—DATE

DATE allows you to reset the system date to the current date or obtain the current date from the system clock. In all the following commands, the parameters enclosed in square brackets are optional.

Syntax: DATE (mm-dd-yy) or DATE (mm/dd/yy) or DATE [mm.dd.yy]

Entering the current time—TIME

Displays the current time and allows you to reset the time.

Syntax: Time [hh:mm[:ss[xx]]]

Listing files in a directory–DIR

DIR is used to display the contents of a directory, ie, the file names, the file size in bytes, the date and time of last modification, the number of bytes available on the disk, and any subdirectories under the current directory. The file name under DOS is represented by a primary name and a secondary name. The primary name can be upto 8 characters of length; it is followed by a dot and a secondary name or extension. The secondary name can be upto 3 characters of length. The file name can be made up of alphabets, digits underscores and hyphens. No other characters are allowed.

Syntax: DIR[d:] [path] [filename] [/P] [/W] [/S]

Options

d:path filename-SPECIFY] the drive letter, path name, or file name when you wish to obtain a directory listing of files that are not in the current directory.

/P–Tells DOS to pause when the screen has been filled. To see the next screen of file names you have to press any key.

/W–Displays a directory showing only file name in a wide format–five names across each line.

/s–Displays the files from the subdirectories also.

Examples

DIR C:–Displays the contents of the current working directory on drive C.

DIR C:*.MAC–Displays only those files in the current working directory of drive C that have the .MAC extension.

* and ? are called wild characters. * replaces a group of characters and ? replaces any one character.

DIR S*.*–Displays only those files whose names are beginning with the letter S and followed by any number of characters and with any extension.

DIR S?.*–Displays only those files whose names are beginning with the letter S and followed by any one letter (or without any following character) with any extension or without extension.

Displaying the contents of a file–Type

TYPE displays a file's content on the screen. This command continuously scrolls the file on the screen. To freeze the text use **Ctrl-Numlock** or pouse key. To stop the TYPE command press **Ctrl-C**. The contents of binary files and Exe files will be meaningless. Only files which are in ASCII format can be typed.

Syntax: Type[d:] [path] filename

Examples

TYPE B:TEST.C–Displays the contents of the file TEST.C from drive B.

If the given file name does not exist in the directory, 'File not Found' message will be displayed on the screen.

Copying files–COPY

COPY is used to copy files with the same or different names.

Syntax:

```
COPY[/A][/B][sd:][spath]sfilename[td:][tpath]tfilename]
```

Options

/A or /B indicates whether the preceding file and all subsequent files are to be read as **ASCII (text)** or binary files, and it is in effect until further modified.

sd:spath sfilename–Specifies source file or files to be copied.

td:tpath tfilename–Specifies target file or files to be copied to. The filename can be specified if you wish to rename the target file during copy. If not specified, the source file name itself will be given to the target file also. But in this case the target drive or directory must be specified. This is because we cannot store two files under same name in the same directory.

/V–Tells DOS to verify that the target file is correct.

Examples

COPY COMMAND.COM A:–From the current drive the file COMMAND COM will be copied to drive A.

COPY B:TEST.C–From the drive B: the file TEST.C will be copied to the current drive.

Deleting files–DEL

This command is used to delete any or groups of files from the directory.

Syntax: DEL [d:][path]filename

Examples

DEL TEST.DBF–Erases the file TEST.DBF from the current directory. If the file is not available in the directory 'File not Found' message will be displayed.

DEL C:\WS4\USHA*.BAK–Deletes all files in directory C:\WS4\USHA with the extension.BAK.

DEL C:\WS4–Erases all the files in directory C:\WS4.

DEL A:*.*–Erases all the files in drive A regardless of the primary and secondary names. But before erasing the following message will be prompted.

```
Are you sure(Y/N)
```

If you have given this command without knowing that it will erase all the files, you can give **N**. This will bring the control back to prompt without erasing any files. But if you give **Y**, it will erase all the files from the directory.

Renaming files–Rename(REN)

This command will change the name of the given file, with the new name given by you. REN will not allow two files to have the same name at the same time. Never rename special files that application programs require to operate.

Syntax: REN[d:][path]oldfilename newfilename

`Oldfilename`–Specifies the file, to change its name.

`newfilename`–Specifies the new name to be assigned to the file (must be on the same drive and path as the file to be renamed).

Examples

`REN *.CAP *.SET`–Renames all the files with extension .CAP as files with extension .SET, with the same corresponding primary names.

Messages

`Duplicate file name or file not found`–This error message will be given by DOS at two cases. One, if the old file name given by you is not available in the given directory; the other when the new file name already exists in the directory. For example, if the file `MYPROG.BAS` is not available and you give the command as `REN MYPROG.BAS PROG.BAS`, you will get this error message.

Creating new subdirectories–`Mkdir(MD)`

This command creates a new subdirectory.

Syntax: `MD[d:]path`

`d:`–Specifies the drive in which you wish to create the new subdirectory.

`path`–Specifies path of directory names, including the name of the sub-directory to be created. The entire path name must not exceed 63 characters, including the backslashes.

Examples

`MD PHONES`–Creates a subdirectory PHONES under the current directory.

`MD\WS4\FILES\PHONES`–Creates a new subdirectory named PHONES under the subdirectory FILES, which is under the subdirectory WS4, which in turn in under the root directory.

Changing the current directory–`Chdir(CD)`

This command changes the current work directory to a new directory.

Syntax: `CHDIR [d:] [path]`

Examples

`CD C:\WS4\LETTER`–This command changes the current directory to LETTER which is under WS4 on drive C. If no drive is specified current drive is assumed. If the given subdirectory does not exist, then invalid message will be displayed.

`CD\`–Allows you to change to the root directory from the current working directory.

`CD..`, changes the current directory to the preceding level of the directory. For example, after the command in the first example, if you give CD.., the current directory changes to `C:WS4`, which is the preceding level of `C:\WS4\LETTER`.

Removing directories–`RMDIR(RD)`

Only empty directories may be removed. First you have to remove all the files in the directory using DEL or Erase command. You cannot delete the root directory.

Syntax: RMDIR [d:]path or RD [d:]path

Examples

RD C: \WP\LETTERS–Deletes the subdirectory LETTERS.

If the given RD command is not valid the following message may be displayed.

Invalid path, not directory, or directory not empty.

Either one of the names you specified was not a directory or was the current directory (which you cannot remove) or the directory you are trying to remove still contains files or subdirectories. For this you have to either check the directory name, change to a different directory, or delete the contents of the directory and then reissue the RD command.

Changing the system prompt–Prompt

Allows you to change the system prompt.

Syntax: PROMPT [prompt]

Options

The prompt can be any literal message displayed on the screen, and it can include any one of the following special characters.

$t Current time

$d Current date

$n Default drive

$p Current path

$v DOS version number

$g Greater-than character (>)

$l Less-than character (<)

$b Vertical bar (|)

$q Equal sign (=)

$- Starts a new line (enters carriage-return/line feed sequence)

$h Backpaces and erases last character

$e ESCAPE character (ASCII 27)

Examples

Prompt $t $b $d $n $g

BEFORE: A>

AFTER : 12:09:33:55 | THIS 9-10-87 | A>

Prompt Dos

BEFORE : A>

AFTER : DOS

Prompt pG

BEFORE: C>

AFTER> C: \WS4\LETTER

Enter PROMPT (with no prompt string) to return to the default prompt.

EXTERNAL COMMANDS

All external commands can be preceded by a drive name and path at which it is available.

Formatting Disks–Format

Prepares a disk by rearranging random magnetic impulses into a series of tracks and sectors so that is it addressable by DOS.

Syntax: `[d:] [path] FORMAT fd: [/s] [/u] [/4]`

Options

/s–Transfers DOS system files into the disk being formatted.

/u–Unconditional formatting to the disk.

/4–Formats a single or double sided disk in a 1.2 MB high-capacity drive.

Examples

FORMAT B:–Formats the disk in drive B.

FORMAT B:/S–Places the DOS files on the disk in drive B and makes it a system disk. Hence the disk may be used as a bootable disk. While formatting the disk you may get any one of the following messages:

`Disk Unsuitable for system disk`

If there is a defective track in the area that contains the DOS files, you will get the above message. Use this disk only for storing data and not as a bootable disk.

`Format failure`

The disk may be unusable. Reissuse the FORMAT command using another disk.

`Invalid media or Track 0 bad-disk unusable`

Either track 0 is bad, in which case the disk is unusable, or the disk and the drive are not compatible. Check the disk and drive; if they are incompatible types, reissue FORMAT with the /4 option; if they are compatible, use a new disk.

Copying system files to another disk–SYS

The DOS hidden system files cannot be copied by Copy command. For this you have to use SYS command.

Syntax: `[d:] [path] SYS cd:`

Examples

SYS B: Copies the DOS files to the disk in drive B.

Messages

`No room for system on destination disk`

This message will be displayed if there is not enough space for the system files on the destination disk.

`No system on default drive`

If DOS cannot locate the system files to be transferred, the above message will be displayed. Select a disk that has the DOS files and try again.

Checking the disk–Chkdsk

Reports disk size, space available, and RAM available. Also reports and optionally corrects internal disk errors.

Syntax: [d:] [path] CHKDSK [cd:] [cpath] [cfilename] [/f] [/v]

Options

/f–Fixes errors in the file allocation table (FAT).

/v–Provides file names as it examines them so that you can see where the error occurs.

Examples

Chkdsk–Checks the default drive reporting any internal errors as well as disk size, free space, and available RAM size.

Chkdsk B:/F–Checks the disk in drive B while fixing any internal errors it finds. You will be asked whether you wish to recover any lost data sectors into data files. If you respond Y, each lost allocation unit is recovered into its own file, named FILEnnnn.CHK. You can inspect the recovered units by using the TYPE or DEBUG command. If you respond N, each allocation unit will be made free and hence the free bytes of disk will increase.

Copying disks–Diskcopy

Copies disks; optionally formats the target disk if it is not formatted previously. DISKCOPY cannot be issued to virtual disks such as the one formed by a SUBST command. This cannot be issued for copying hard disk to floppy disk.

Syntax: [d:] [path] DISKCOPY [sd: [td:]] [/1] [/v]

Options

/1–Copies only the first side of the double sided disk

/v–Verifies that the information is copied correctly

Examples

Diskcopy A: B:–Copies the disk in drive A onto the disk in drive B.

Diskcopy–Copies the disk in the default drive to another disk that will be placed in the default drive.

You have to note that if the target disk has some files already, then those will be erased automatically during this process. This command will copy all the information available from the source to target disk, including the hidden files and subdirectories. Any one of the following messages may be displayed while using this command.

```
Copy Complete
Copy another (Y/N)?
```

If the copying was done perfectly, the above message will be displayed. To continue the disk copy process for another disk, you have to press Y; otherwise you have to press N.

Formatting while copying

If the target disk is not formatted previously then this command will format the disk automatically. During that time the above message will be displayed.

Target diskette may be unusable

If the target disk is having any unrecoverable read, write or verify errors, the above message will be issued.

Displaying directory tree—Tree

Sometimes you may have to see only the directories available in the disk. If you give DIR command, you will also get the file names along with the directory names. Hence TREE command can be given to see only directories.

Syntax: [d:] [path] TREE [pd:] [/F]

Options

/F Displays all the file names within each subdirectory.

Printing files—Print

Allows you to set up a print queue for printing files while continuing to work in DOS.

Syntax: PRINT [/C][/T] [d:] [path] [filename]

Options

/C—Specifies which file or files are to be removed from the print queue. The preceding files and all subsequent file names on the command line are cancelled until a /P parameter is encountered on the command line.

/T—Removes all files from the print queue.

Example

PRINT *.BAS—Prints all the files with secondary name (extension) as .BAS one by one.

PRINT A: SALES.BAS—Prints the file SALES.BAS from drive A.

You have seen some of the important commands of DOS. These commands may be frequently used in your computer operations. The rest of the commands can be learnt with the help provided by DOS. The help text about any DOS command may be obtained by typing the command followed by /?