

INTRODUCTION TO MICROCOMPUTERS AND DATA PROCESSING

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Last Updated: December 26, 1992**

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Chapter 0 -- INTRODUCTION

The purpose of this book is to give the student an introduction to using the following programs:

SuperCalc 5¹, dBASE III+² and WordPerfect 5.1³

SuperCalc is a spreadsheet program. dBASE is a data base program and WordPerfect is a word processing program. (And is the program used throughout the entire process of writing this book.)

The book will begin with an explanation of the notational conventions used throughout the manual. Hopefully, Chapter 1 will eliminate many of the ambiguities that can arise in a book of this nature.

Chapter 2 is the lab manual. It will describe important beginning concepts like how to turn on the computer.

The remainder of the book will discuss the use of the programs and related terminology. For each program (SuperCalc, dBase and WordPerfect) there will be an introductory chapter that describes the uses of a particular program and important concepts that relate to each program. These introductory chapters will be mostly program independent.

The second chapter for each program is a command reference. The commands for each program are covered. The purpose of this chapter is to give the student an idea of what the program can do.

The next chapter is a tutorial on entering a spreadsheet, data base or word processing document, step by step. I have made an attempt to put page references in wherever necessary. When you see something like (see page xx.), examine the reference unless you understand the topic being discussed.

¹SuperCalc is a trademark of Computer Associates and will hereafter be referred to as SuperCalc.

²dBASE III+ is a trademark of Ashton-Tate and will hereafter be referred to as dBase.

³WordPerfect is a trademark of WordPerfect Corporation and will hereafter be referred to as WordPerfect.

One final note; this book is not meant to stand alone as a sole authority for anything it contains. My intent is for this book to be used as a classroom aid. This book will hopefully reduce the note taking burden of the class.

Part of my reasoning for writing such a book is that I believe it is impossible to write a truly complete book. A lecturer is an invaluable aid throughout the introductory learning process.

I hope this book and the course help the student to jump over many of the hurdles normally faced by someone just starting out using computers.

Good luck.

ANY SUGGESTED CHANGES TO THIS MANUAL ARE GREATLY APPRECIATED.

It is impossible to catch all errors or explain everything well enough. This manual will be changed often, and, as such, I appreciate any and all suggested changes.

Special thanks go to Sue Richers for her help in some of the editing of the book, Bob Baines in his editing of the computer glossary and Gary "Mr. A" Arner for his many corrections and to many past students who have caught the errors that I always manage to create.

Chapter 1 -- Notational Conventions

PURPOSE: The purpose of this chapter is to define the notational conventions used throughout this book. It is hoped that this chapter will remove many of the possible ambiguities in a book of this nature.

When you are told to type something, it will be represented by a message like "type the following:", and the next line will be offset by two tab stops from the left margin. An example follows. (Do not do this for now)

Type the following:

dir b:<enter>

Note that the command is typed in all lower case letters. The case of the letters typed is generally not important for COMMANDS but is generally important for DATA. The difference being a command instructs the computer to do something while data is what commands act on.

The command "Dir" above can be entered with any case. A proper name such as my name, however, should have the first letter capitalized and the rest of the word in lower case (Brett L. Schuchert). <enter> is an example of one of the special symbols used throughout the book.

SPECIAL NOTATIONS

The following special notations will be used throughout this book. Some of this information will not make sense now, but by the end of the book all of these special notations will be clear. Examples follow the table.

SYMBOL	MEANING
Alt-	Hold down the alternate key and type the character after the - (dash).
Ctrl-	Hold down the control key and type the character after the - (dash).
Shift-	Hold down the shift key and type the character after the - (dash).
()	Information in () is a side note or a clarification.
[]	The information contained with the [] is optional.
<>	The thing in the <> is some kind of object or special key.

SYMBOL	MEANING
Ø	This is the symbol used for the Zero key.

EXAMPLES:

- Ctrl-t Hold down the control key and press the letter t.
 Alt-t Hold down the alternate key and press the letter t.
 <F1Ø> Press the F1Ø key.
 Alt-<F9> Hold down the alternate key and press the F9 key.
 <Filename> Do not literally type "Filename" but instead type a valid file name⁴.
 dir [<Drive>] In this case you should type DIR. The dir command can be followed by an optional drive letter. Remember, things in brackets [] are optional. In this case an optional drive letter⁵ may be supplied.
 Alt-Shift-<F1Ø> Hold down BOTH the alternate and shift keys and press F1Ø.

It might seem that the above conventions are confusing or may even make matters worse but this is not the case. For example, how should the following command be typed?

dir b: enter key

Dir B: should be typed and then hit the <enter> key. It might be tempting to literally type the above.

This ends the chapter on notational conventions. Know these conventions early on because your instructor will use these on the board, and the book will use them throughout.

⁴A valid file name is a string of 1-8 characters followed by an optional period and an extension of 1-3 characters. Some characters cannot be used. (?) and (*) are examples of two characters you cannot use.) A file name can be preceded by an optional drive letter. DO NOT USE the extension of 1-3 characters when using dBase or SuperCalc.

⁵A valid drive letter designates which disk drive will be used. On many computers the valid drive letters are A:, B: and C:.

Chapter 2 -- Lab Manual

PURPOSE: The purpose of this chapter is to familiarize the student with the use of hardware and software in the lab.

WARNING: Typical hardware will be covered. Much of this information may not apply to your lab.

2.1 THE PRINTER

The printer is a peripheral device⁶ used for output⁷. The purpose of this device is to print information on a piece of paper. The medium of the printer is paper.

The following discussion will cover the Epson LX-800⁸ (a typical printer.) Much of this information will apply generally to all dot-matrix printers. This printer uses perforated paper with pin feed holes. The pin feed holes are used to pull paper through the printer.

2.1.1 LOADING PRINTER PAPER

Follow these steps to load paper into the printer:

1. Turn the printer off (if necessary) and flip the pin feed holder covers up.
2. Push paper through the back side of the printer, making sure that the paper goes under the platen and behind the paper holder.
3. Place the pin feed holes in the pin feed holder, making sure that the paper is aligned properly.
4. Roll the paper up until the perforated edge is aligned at the top of the print head. (Doing so will waste a sheet of paper)

⁶A peripheral device (or device) is an object that is connected to the computer, usually via a connecting cable, whose purpose it is to perform some specific task. (e.g. print text and graphics.)

⁷Output refers to information supplied BY the computer.

⁸Epson is a trademark of Epson Corporation.

Take a look at the printer manual for a more detailed description of how to load paper into the printer.

2.1.2 PAPER ALIGNMENT

The paper should be properly aligned before the printer is turned on. Paper alignment must be done every time the printer is turned to set the top page margin. If the paper is aligned incorrectly by 2", the top margin when printing will be off by 2" also. To align the paper vertically, make sure that the perforated edge is just at the top edge of the printer ribbon.

Alignment of the paper horizontally is a bit harder. Follow these steps:

1. There are levers on the pin feed holders that lock them into place. Flip these up and, if necessary, turn the printer off.
2. Hold down the linefeed button and turn the printer on. This will cause the printer to do a self test.
3. While the printer is doing a self test, use both hands to move the pin feed holders to the right or left as necessary. Align the paper so that the self test prints letters just about on the left perforated edge of the paper.
4. After the paper is aligned, flip the left pin feed holder lever down to lock it in place.
5. Turn the printer off.
6. Pull the right pin feed holder to the right, this will pull the paper tight. Flip the lever on the right pin feed holder down.

2.1.3 PRINTER BUTTONS/LIGHTS

On the printer there are three buttons; and four lights that show printer status, control print quality and paper alignment. See Figure 1, page 8. The lights are the following:

Power	If on, the power is turned on.
Ready	If on, the printer is ready to accept information and print.
Paper Out	If on, the printer is out of paper.
On line	If on, the printer will accept information.

Do not confuse the Ready light with the On line light. Of all lights, the On line light is the most important since it determines how the printer buttons function.

The printer buttons are, from top to bottom, On line(off line), Form feed(NLQ) and Line feed(Draft).

The name in () refers to what the button does when the On line light is ON.

When the On line light is ON, the printer buttons do the following:

On line	Turns the On line light OFF. (Toggles the On line light)
Form Feed(NLQ)	The printer will beep twice and any additional printing will be done in Near Letter Quality mode. This means the printer will print relatively slowly, but the quality of the print will increase.
Line Feed(Draft)	The printer will beep once and any additional printing will be done in draft(default ⁹) mode. Draft mode prints faster but does not look as nice. It is however acceptable for homework.

When the On line Light is OFF, the printer buttons do the following:

On line	Turns the On line light ON. (Toggles the On line light)
Form feed(NLQ)	Advances the paper to the beginning of the next page (the perforated edge.) This only works properly if the paper was properly aligned when the printer was turned on. (See paper alignment, page 6.)
Line feed(Draft)	The printer will advance one line. If this button is held down, the printer will continue to advance one line at a time.

⁹A default is something that is assumed unless told otherwise. A word processor usually has default left and right margins of 1".

2.1.4 REMOVING PAPER FROM THE PRINTER

After printing it will be necessary to advance the paper out of the printer. To do so, follow these steps:

1. Press the On line button to turn the On line light off. (Ignore this step if the On line light is already off)
2. Press the Form Feed button. It may be necessary to press the Form Feed button twice if the printer stopped printing halfway through the current page.
3. Press the On line button to turn the On line light back on. This step is necessary for the printer to work. Even if the printer will no longer be used, perform this step. It is a good habit to have.

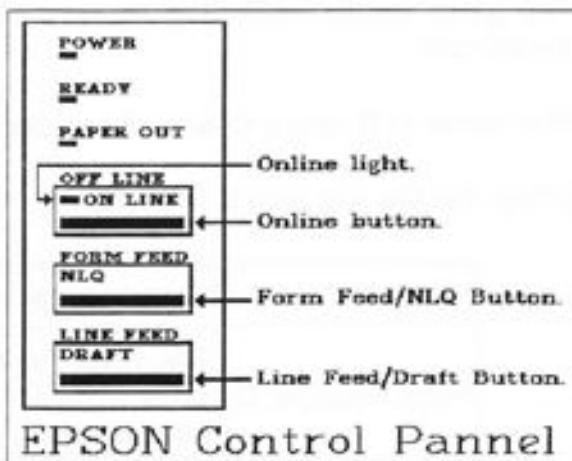


Figure 1

2.2 THE KEYBOARD

The keyboard is the primary input device on the computer. Knowing how to use the keyboard is essential to being able to use the computer. The IBM¹⁰ Keyboard has the layout of an IBM selectric typewriter with additional keys above the letters and numbers and to the right of the enter key. See Figure 2, page 11.

Note the following definitions as they will apply throughout the book.

2.2.1 TYPING DEFINITIONS

- Type: Means, press the key without holding the key down. Just like using a typewriter.
Hold: Means, press the key and hold it down until told to release the key.
Press: Same as type.

These definitions are important because the majority of the keys on the keyboard repeat if held for too long. When the keys repeat, the desired result will most often not occur.

¹⁰IBM is a trademark of International Business Machine Corporation.

2.2.2 SPECIAL KEYS

The following is a list of special keys. The location of the key will be described. The use of the key will also be described where necessary.

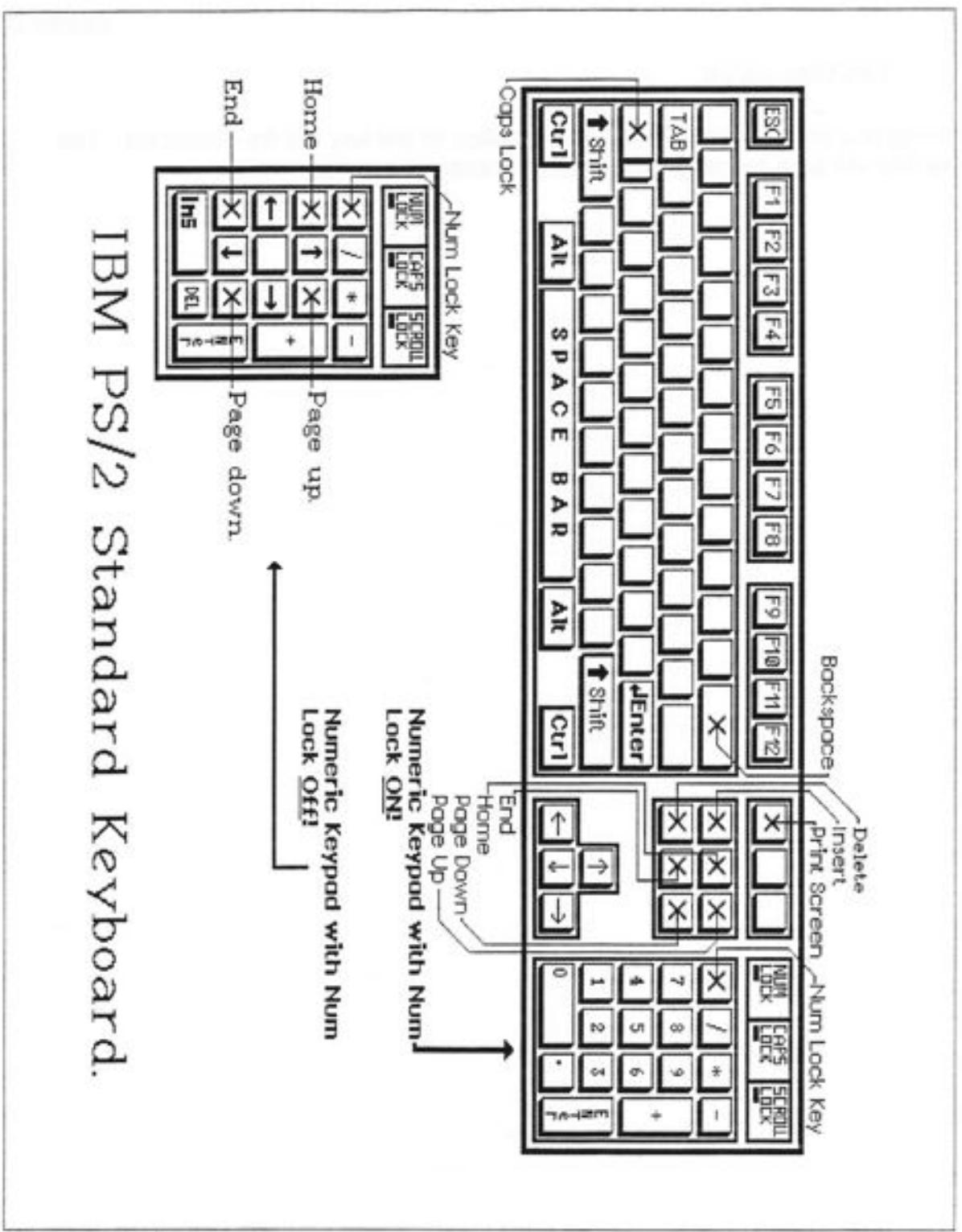


Figure 2 A Keyboard

The **Alt-(Alternate)** key has two locations on either side of the space bar. This key is mentioned in Chapter 1 on notational conventions. To use this key, hold down the alt key, type the letter following the - (dash), and release the alt key.

The **Caps Lock** is located above the left-shift key. Hitting the Caps lock key toggles¹¹ the Caps Lock Light. The Caps Lock **ONLY CAPITALIZES LETTERS**. i.e. to get a colon(:), you MUST use a shift key and press the colon:semicolon key.

The **Ctrl-(Control)** key has two locations on either side of the two alt keys. It is also mentioned in the chapter on notational conventions. To use this key, hold down the ctrl key, type the letter following the - (dash), and release the ctrl key.

The **Cursor(arrows)** keys have two locations. The first location is just to the right of the control key on the right side of the keyboard. The second location is around the numeric keypad. See Figure 2. These keys will move the Cursor¹² around the screen in some programs and have no function in other programs. These keys repeat.

The **delete** key is located in two places. The first is under the insert key and the second is on the . key of the numeric keypad. Its function varies with different programs. To use it, just type the key. It will be represented with the following symbol: . This key repeats.

The **ESC(Escape)** key is located at the upper left hand corner of the keyboard. This key has different uses in different programs. It will be represented with the following symbol: <ESC>. To actually use the <ESC> key, just type the key. This key repeats.

The **Home** and **End** keys are located just to the right of the insert and delete keys respectively. They will be represented with the following symbols: <home> & <end>. To use either, type them. These keys are also located on the 7 and 1 keys of the numeric keypad. Their functions varies with different programs. These keys repeat.

The **function** keys are located across the top of the keyboard. They are labeled F1 to F12 and will be represented like this: <F1>, <F2>, ... These keys work differently for different programs. To use these keys, type them. These keys repeat.

¹¹If on, turns off. If off, turns on.

¹²A cursor is a flashing line or block on the screen of the computer. It points to where information will go when it is typed. The cursor may not flash.

The **Insert** key is located in two places. The first is under the print screen key and the second is on the \varnothing key of the numeric keypad. See figure 2, page 11. Its function varies with different programs. To use it, type it. It will be represented with the following symbol: <ins>. This key repeats.

The **Num Lock** key is located above the numeric keypad. Its function is to toggle the num lock light. When the num lock light is on, the numeric keypad acts like a numeric keypad. When num lock light is off the numeric keypad acts like cursor keys. The <Home>, <End>, <PgUp> and <PgDn> keys. It will be represented with the following symbol: <Num Lock>.

The **Page Up** and **Page Down** keys are located just to the right of the home and end keys. These keys are also located on the 9 and 3 keys of the numeric keypad. They will be represented with the following symbols: <PgUp> & <PgDn>. Their function varies with different programs. To use these keys, type them. These keys repeat.

The **Print Screen** key is located on the right side of the keyboard just to the right of <F12>. To use this key, type it. This key repeats. When you press this key, the printer will typically print what you see on the screen¹³. **This key is a feature of the computer and not the software.** As a result, its function will be approximately the same in every program.

The **Shift** key has two locations, one each above both of the control keys. It works just like a shift key on a typewriter. The use of this key will be represented by underlining what should be shifted. To actually use the key, hold the shift key and type the text. The shift key will be represented with the following symbol: shift-. This key does not repeat.

The **Tab** key is located above the Caps Lock key. Its use is different for different programs. To use this key, type it. It will be represented with the following symbol: <Tab>. This key repeats.

¹³Underlining, bold type and colors are a few examples of things which will NOT be printed.

Key review points:

1. Most of the keys repeat so DO NOT hold down a key unless necessary.
2. Keys may do entirely different things in different programs.
3. Most of the special keys are used like regular keys. You just type them.
4. Many of the keys are duplicated. Either key will work fine.
5. The numeric keypad mentioned above and in Figure 2 has two different functions.

The keyboard is initially complicated, but with practice the location and usage of these various keys will become second nature.

2.3 THE COMPUTER

The computers used at the Iowa City Lab are IBM compatible computers. One of the particular computers in use in the lab is the IBM PS/2 Model 25. These machines are relatively compact with the computer and monitor¹⁴ as one unit. See Figure 3, page 14. Important points are labeled on Figure 3 and descriptions follow:

Power Switch	The power switch is used to turn the computer on or off.
Contrast Knob	The contrast knob is used to change the contrast between letters and the background on the monitor.
Brightness Knob	The brightness knob is used to change the brightness of the characters on the screen.
Disk Drives	The disk drives are the primary storage device for this and most computers. There are two of them. The one on the left is called the A: drive and the one on the right is the B: drive.
Disk Eject Button	Each disk drive has a disk eject button. Push this button to pop the disk out of the disk drive.
Drive Access Light	The drive access light is lit when the disk in the disk drive is being used.

¹⁴A monitor is a TV like device connected to the computer. It allows the user to see what is going on.

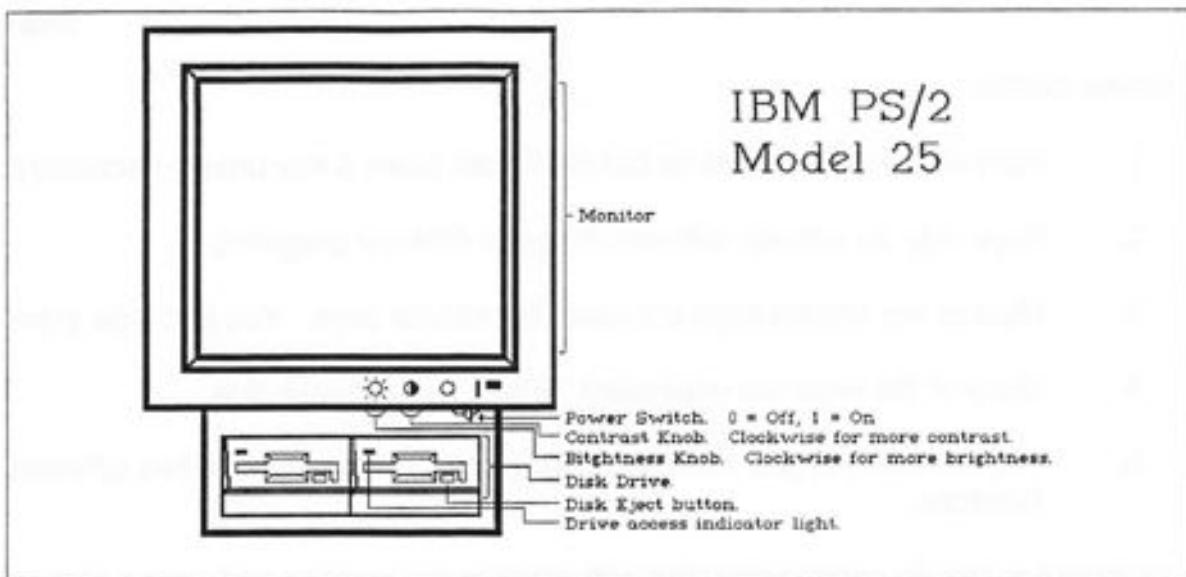


Figure 3 An IBM PS/2 Model 25

NOTES:

1. Do not take the disk out of the disk drive when the drive access light is on.
2. The monitor on this computer is physically connected to the computer. Most computer systems have a separate monitor.
3. The disk should only fit into the disk drive one way. The proper way to insert the disk is label side up and metal cover in first.

Another way to make sure that the disk is being inserted properly is to find the arrow on the disk (it's by the metal cover) and put the disk in the disk drive with the arrow up and pointing towards the computer.

4. To remove the disk just press the drive eject button and pull the disk out.
5. A: and B: mentioned above refer to how the computer differentiates between the disk drives. When information is needed from the disk drive the computer will check either the A: drive or the B: drive depending on which one the computer is currently operating.

Generally speaking, the A: drive is used for programs and the B: drive is used for data disks.

6. To turn the computer on, flip the power switch to the right.
7. If the screen is hard to read, adjust the brightness or contrast knobs.

2.4 DISK CARE

1. Never expose a disk to direct sunlight.
2. Do not allow the disk to get wet.
3. If the temperature is comfortable for you, it probably is for the disk. Do not leave a disk in the car on a hot or cold day. If you do, allow the disk to cool off or warm up before using it.

2.5 COMMANDS AND PARAMETERS

Using the computer is basically a three to four step process.

1. Information is entered(input) into the computer.
2. The computer takes this information and does something(processes) with it.
3. The computer gives(outputs) a result.
4. The result may be stored.

Entering information begins with a command. A command tells the computer what to do. A command may be (and typically is) followed by parameters. A parameter gives additional information about how to perform the command. For example:

The command DIR B: will give a DIRectory (or listing) of all the files on the B: drive. In this case DIR is the command and B: is a parameter.

The computer is ready to accept a command when either one of the following is on the screen:

A>
B>

This A> or B> is called the command or the DOS prompt. DOS stands for Disk Operating System and is a human interface between the user and the computer. This means that DOS allows the user to type on the keyboard and the computer to "see" what is being typed. Once a command or data has been typed, the computer processes this information and gives some result.

2.6 DOS COMMANDS

The following is a brief list of DOS commands. Press <enter> after typing any of these commands. A couple of definitions are necessary, however.

Filename A filename is used by DOS to designate one file from another. Two files cannot have the same (fully extended) name. A filename may be from 1 to 8 characters long and can be followed by an optional dot and 1 to 3 letters more. Use only letters, numbers, and the underscore (_) character, in your filenames to avoid hassle. The first 1 to 8 letters are generally referred to as the file name. The 1 to 3 additional letters after the dot are generally referred to as the file extension.

The case of the letters is unimportant because DOS will convert any lower case letters to upper case.

Typical filenames include:

COMMAND.COM	BOOK	CH4_2.INT
CHUCK	VER1.10	LABMAN.BAK

Note that the use of the word "filename" is therefore ambiguous. It can either refer to the first 8 letters of the name of a file or the entire file name including the extension. Context will generally clarify which definition applies.

Extension The 1 to 3 additional characters of a full filename after the optional dot.

Directory A directory is like a file folder in that it can contain files. A directory has a name which itself must be a valid DOS filename.

Wildcard A way to denote a group of filenames. There are two wildcard characters. They are:

- ? Substitute any single character.
- * Substitute any number (including zero) of characters up to either the end of the filename (first 1 to 8 letters) or the end of the extension.

For example:

B? All files that begin with a B and have any 1 additional characters and have no extension.

B* All files that begin with a B and have 0 - 7 additional characters, but no extension.

*.exe All files that have any file name and the extension .exe.

2.6.1 Logged Drive

To change the logged disk drive, type the letter of the drive (drive letter) followed by a colon (:) and press <enter>. For example:

- A: Make the A: drive the current logged drive¹⁵.
- B: Make the B: drive the current logged drive.

2.6.2 Simple DOS Commands.

The following is a brief list of simple DOS commands. They are simple since they do not involve using any disk drives or files.

CLS Clears the screen. The DOS prompt is placed at the top of the screen.
Type CLS followed by <enter>.

DATE Allows the system date to be set. Type DATE followed by the date in mm-dd-yy format (for example 9-6-67).

TIME Allows the system time to be set. Type TIME followed by the current time in 24-hour format (for example, 15:25 for 4:25 pm.)

2.6.3 Single File DOS Commands.

Each of the following commands operate on a single file.

COPY <from file> <to file>

Copy from the <from file> to the <to file>. A file is a collection of data stored on a disk. A filename (represented by <FileName>) is the name associated with the file.

DEL <filename>

Removes the file named <filename> from the disk.

REN <old filename> <new filename>

Allows a file name to be changed. <Old filename> is the name of the file to be changed. <New filename> is the name for the file after being renamed.

¹⁵The current logged drive is the place where DOS will search for commands and files; unless otherwise told.

2.6.4 Directory/Disk Related DOS Commands

Each of the following commands operate on an entire disk or a directory.

DIR[<drive>][/P][/W]

Lists the files on a disk. A <drive> letter is optional but will give a directory (listing of files) of a specific disk. /P stands for pause and is optional. When used, the directory listing will pause every time the screen is filled with file names and ask for a key press before continuing. /W stands for wide and is optional. When used, the directory listing will be 5 columns wide.

FORMAT¹⁶ <drive>¹⁷[/S][/V]

Format the disk in drive <drive>. /S stands for system and is optional. If used, the disk will be bootable (See page 21). /V is stands for volume label and is optional. If used, the computer will prompt the user for a 1 - 11 character volume label after formatting the disk.

Part of the formatting process includes creating a root directory in which every file will be stored. This root directory is named \ (back slash).

CD <filename>

Change directory. Changes the current working directory to the specified filename. Note the following special directory names:

- . Current directory.
- .. Parent directory.

MKDIR (MD) <filename>

Make directory. Either mkdir or md can be used. Creates a directory called <filename> under the current directory.

RMDIR(RD) <filename>

Remove directory. Either rmdir or rd can be used. Removes the directory called <filename> under the current directory. The directory must be empty for this command to work.

¹⁶Formatting a disk prepares the disk to have information saved on it. It must be done on a new disk once to prepare the disk for a specific system. (e.g. IBM, Amiga ...) If it is done again, any previous information will be lost.

¹⁷On our Model 25s <drive> may be A: or B:. In the case of the format command it will generally be B:.

2.7 Notes on Directories

When a disk is formatted, a root directory is created for that disk. This root directory is at the top of a tree-like structure of directories. Figure 4 contains an example tree structure. Note that the root directory (\) is all the way to the left. Directly under the root directory are the directories: BATCH, DOS, DOWNLOAD, ELVIS, GMK3, PCLFONTS, PCTOOLS, PVGA, SPICE, WP, and PSOUT.

Figure 5 contains a more simple directory structure that may be useful for students in Introduction to Micro-Computers and Data Processing. This directory structure contains three sub-directories, one for each of the programs that will be used in this class.

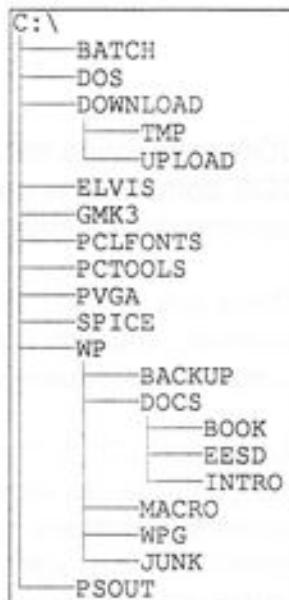


Figure 4

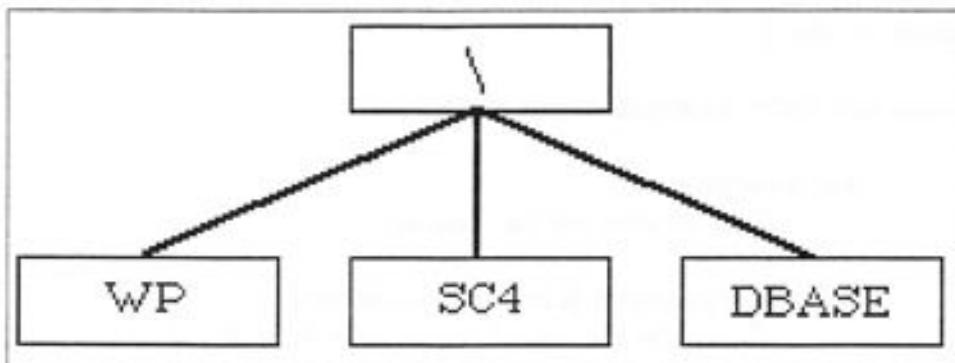


Figure 5 - A Simple Directory Example

The following steps could be used to create the structure contained in Figure 5.

1. Get a blank (formatted) disk.
2. Boot the system, and make sure the formatted disk is in the B: drive.
3. Change the logged drive to the B: drive by typing (at the A> prompt):
B:<enter>
4. Create the directories by typing the following three commands:

```
mkdir wp<enter>
mkdir sc4<enter>
mkdir dbase<enter>
```

INTERNAL & EXTERNAL DOS COMMANDS

DOS commands fall into one of two major categories, internal and external. An internal DOS command is one that is always available at the DOS prompt. All of the above commands are internal except for the format command.

There are at least two factors that determine whether a DOS command is internal or external. Internal commands are generally "small" or simple and they are generally used more frequently.

An external DOS command is one that is on the DOS disk. The DOS disk must be in the computer to access these commands. From the above list only the format is an external command but most of the DOS commands are external. The external commands are either used infrequently or are too large to leave in the memory of the computer.

Since format is an external command, DOS disk must be in either the A: drive or the B: drive to use it.

Here are some example commands:

A>cls<enter>
The screen will be cleared.

A>copy myresume B:myresume<enter>
Copy the file called myresume from the A: disk to a file called myresume on the b: drive. Notice that this command copied the file myresume from the A: drive to the B: drive. See below.

A>B:<enter>
Change the logged drive from the A: drive to the B: drive.

The logged drive is the place where DOS will look for commands and files unless told otherwise.

B>format a:<enter>

Format a disk in the A: drive. Notice the B> prompt. This means that the current logged drive is the B: drive. This command will only work if the DOS disk is in the B: drive. If the DOS disk is not in the B: drive, the message "Bad command or file name" will result.

A>date<enter>

The computer will respond with a message like "Current date is Wed 1-04-1989". The computer will then prompt the user with "Enter new date (mm-dd-yy)." Enter the date by typing the month number followed by a - (dash) then the day number followed by a - (dash) then the last two digits of the year. For example, to enter January 15, 1988 type: 1-15-88. Do not type the . (period).

A>time<enter>

The computer will respond with a message like "Current time is 20:44:46.80". The time is in 24 hour format which means that any time from 12:00:00.00 to 24:00:00.00 is p.m. To find the actual time, subtract 12 from any time greater than 12:59. To go from a.m./p.m. to 24 hour format, add 12 to the hour if it is after 12 noon.

The computer will next prompt you with "Enter new time:". Enter the time if it is wrong or just press <enter> to ignore this. To enter the time, type the hour followed by a : (colon) then the minute followed by a : (colon) then the seconds. (You can skip the last colon and the seconds) For example, to enter 3 p.m. type: 15:00. Do not type the . (period).

BOOTING THE SYSTEM

Booting the system involves putting a bootable disk in the A: drive and turning on the computer. A bootable disk is one that has DOS on it. This may seem confusing, but DOS is a program like a word processor is a program. The function of DOS is to allow the computer to run other programs and to communicate with the user. If the DOS system files are on a disk, then the disk will be bootable.

Follow these steps to boot the system:

1. Place the DOS disk or another bootable disk in the A: drive.
2. Turn the computer on.

After about a minute the computer will beep, the A: drive light will turn on and after a few seconds the computer will prompt the user for some information.

3. The first prompt will be: "Current time is 00:00:01.80" or something similar. The next line will be "Enter new time:" Enter the current time. (Always enter the time.)
4. The next thing prompt will be: "Current date is 1-01-80" or something similar. The next line will be "Enter new date." Enter the date. (Always enter the date.)
5. The A> prompt should then appear. The computer is now ready to be used.

NOTE: Steps 3 and 4 may be reversed. If so, enter the date first; followed by the time.

FORMATTING A DATA DISK

To format a data disk, follow these steps:

1. Put a DOS disk in the A: drive and your disk in the B: drive. (You will need to purchase a disk for this step!)
2. Boot the system. (See page 21.)
3. At the A> prompt type:
FORMAT B:<enter>
4. The A: drive light will go on for a few seconds then the computer will respond with:
**Insert new diskette for drive B:
and strike ENTER when ready**
A disk is already in drive B: as a result of step 1, so just hit <enter>.
5. The B: drive light will go on and the computer will show which head and cylinder are being formatted. (This information will be covered in the hardware section of Intro.)

6. After about 3 minutes the drive will turn off and a message stating the number of bytes available on the disk will be displayed. The computer will ask if any more disks should be formatted. If so, type Y<Enter> otherwise N.

If Y<enter> is typed, go back to step 4.

7. The A> prompt should reappear. The disk is now formatted.

ASSIGNMENTS

1. Define each of the following terms using your own words: DOS, disk, file names, drive letter, peripheral device, printer, DIR command, format command, track/cylinder, NLQ, Form feed, Line feed, Alphanumeric, Monitor, Cursor, Command, Parameter, Logged drive, Input, Process, Output, Storage, Draft, Date command, Time command. (15 points)
2. Answer each of the following:
 - a. What are the three or four steps to using a computer?
 - b. What are the 3 steps to removing paper from the printer?
 - c. How is the system booted using a DOS disk?
 - d. What are three important things to remember about disk care?
 - e. What is a difference between commands and parameters?
 - f. What is a difference between Internal and external DOS commands?
 - g. Why it is necessary to format a disk?
 - h. What does formatting do to a disk?
 - i. What is the primary input device of the computer?
3. Format a disk and obtain a print screen from this process. (15 points)

Chapter 3 -- Word Processing Concepts

Word processing is probably one of the most frequently used applications on a computer. Word processing is simply the processing of words. This book, for example, was written with a word processor. (WordPerfect 5.0 was used.)

TERM/CONCEPT LIST

BLOCK

A block is a user defined region of text. A block is defined by moving the cursor to the top of the block, hitting the block key and moving the cursor to the bottom of the block.

BLOCK COMMANDS

Block commands are commands available to perform on a block. Common commands are:

DELETE

Delete the block from the document.

MOVE

Move the block to another part of the document.

COPY

Make a copy of the block in another part of the document.

SWITCH CASE

Switch all the letters in a block to either upper case or lower case.

PRINT

A block of text can be printed.

Other commands available while block is on: Protect, Underline, Bold, Center and Flush right.

The block move command can be used to reverse the order of paragraphs in a document.

CENTERING

Centering refers to centering a line of text or to centering the entire page of a document. On a typewriter with 1" margins and pica type, the center point is column 42. ($8.5"/2 = 4.25" = 4.2"$. $4.2" * 10 \text{ CPI} = 42 \text{ characters or column 42.}$)

CHARACTER ATTRIBUTES

Character attributes refer to how characters look or are emphasized. Underlining, bold and italicized are examples of character attributes.

CHARACTER HEIGHT

The character height is measured in points. The character height refers to how tall the character is. Standard character height is 10 points.

DOCUMENT

A document is created by a word processor. A document may be a letter, a paper or even a book.

ENDNOTES

Endnotes are notations placed at the end of the document. Endnotes are used in the same manner as footnotes.

FONT

Font is a combination of the type face, character height and character attribute.

FOOTERS

A footer is used in the same manner as a header. Notice that the name of the chapter and the page number is placed at the bottom of every page in the book. This is accomplished with a footer.

FOOTNOTES

Footnotes are notations placed at the end of pages. Footnotes usually quote sources or give filler information. See the bottom of this page for an example footnote¹⁸.

FORMATTING

Formatting a document refers to making changes in the margins, tabs, line spacing, line height, character font, headers, footers ...

HARD RETURN

A hard return is placed in the document when the <enter> key is pressed. The word hard refers to the fact that the USER put the return there.

¹⁸This is an example footnote.

HEADERS

A header is often used as a page title. Headers are generally used to denote chapters or perhaps sections.

INDENT/OUTDENT

Indentation and outdenting refers to how the left margin is aligned. This book uses a great deal of indentation. Each of these definitions are indented one tab stop.

The first line of each of these definitions (the word being defined) is outdented relative to the body of the text.

This paragraph is here to give an example of an outdented line. Notice how the first line is outdented half an inch relative to this line and the line before it.

INSERT MODE

Insert mode is a feature available in most word processors. When typing, the word processor will push text after the cursor to the right or if necessary down to the next line.

For example, if the cursor is placed before the word INSERT at the beginning of this definition and the word HELP is typed, the word insert will be pushed over 5 spaces (1 extra place for a blank space) to make room for the word.

JUSTIFICATION

Justification refers to how left and/or right margins look. Justified lines are lined up. In most contemporary word processors, justification refers to how the right margin looks.

This document is printed with justification off, that is the right margin is not straight but is staggered.

This is an example of a paragraph that is justified. Notice how the right margin is lined up. This is accomplished by adding white space between words or even letters to make the right margin straight. Newspapers are usually fully justified, that is both the right and left margins are straight.

LINE SPACING

Line spacing refers to the number of blank lines between lines.

Single spacing means no blank lines between text lines, double means one blank line between text lines. The number of blank lines between text lines is equal to the line spacing minus one.

LPI(Lines Per Inch)

The lines per inch refers to the number of printing lines per inch. The standard number of lines per inch is 6.

There are 72 points in an inch and 6 lines per inch. This means that the maximum character height available, so that characters on top of each other just touch, is $72 \text{ (points/inch)} / 6 \text{ (Lines/inch)}$ or 12 points/line. Remember that the standard height of a character is 10 points, this gives 2 points between characters on top of each other or $1/36"$.

OVERWRITE/TYPEOVER MODE

When typeover mode is on, the word processor will not push text to the right of the cursor over. This means that text could be overwritten.

A typewriter (without memory) is perpetually in overwrite mode.

PAGINATION

Pagination refers to the formatting of information on a page by page basis. When line margins, fonts or other formats are changed, the word processor repaginates the document.

Pagination can also refer to the user actively selecting page breaks and grouping of information onto particular pages.

PAGE MARGINS

Page margins refer to the amount of white space on the page. Standard margins are 1" top and bottom. On a standard sized piece of paper this leaves 6.5" x 9" to type on.

PAGE NUMBERS

Page numbers are used to number the pages of a document. A standard way to number the pages of a thesis is to leave the first page unnumbered and to number all remaining pages at the bottom center of the page.

PAGE SIZE

Page size refers to the size of paper to be used in the printer. Standard paper is 8.5" x 11". Legal paper is 8.5" x 14".

PARAGRAPH

The word paragraph, like the word "word" has many definitions. Most word processors define a paragraph to be the text from the current cursor location to the next hard return character.

PITCH(CPI)

Pitch or CPI(Characters Per Inch) refers to the width of characters. The most familiar pitches are 10 CPI and 12 CPI, that is, Pica and Elite. The larger the pitch, the more characters per inch and the smaller the characters.

On a standard piece of paper, with standard margins, there are 65 characters available per line in pica type ($8.5" - 1"(left margin) - 1"(right margin) = 6.5"$. $6.5" * 10 \text{ CPI} = 65 \text{ characters}$) and 78 characters available ($6.5" * 12 \text{ CPI}$) in elite type.

POINT

A point is a unit of measurement used in the word processing field. There are 72 points per inch.

PRINT QUALITY

The print quality is related to the character height, pitch and font. Print quality is also dependent upon the printer used.

Print quality refers to how nice the print looks.

PROPORTIONAL SPACING

Proportional spacing is used to remove extra white space between letters in a word. The bulk of this document is proportionally spaced. This means that a letter i takes up less space than does the letter t.

A typewriter is generally NOT proportionally spaced.

Pitch is not defined for a proportionally spaced font. (Although the average character width can be used for the pitch to get an idea of the number of characters that will fit on a line.)

REFORMATTING

Reformatting is a function performed when changes are made to a document. When a word is removed from a line, all words after the one removed move back to fill in the space created by removing the word.

SEARCH/REPLACE

Most word processors have a search feature. The search feature allows the user to find a line of text, a number, or anything else that can be typed.

Replace is an extension of search. Replace allows regions of text to be replaced with something new.

SOFT RETURN

A soft return is placed in the document when the computer performs word wrap. The soft refers to the fact that the WORD PROCESSOR put the return there.

SPELL CHECKING

Spell checking is a feature of most word processors where the word processor compares every word in a document to a dictionary. If the word is incorrectly spelled, or unknown, the word processor will flag that word as being unknown.

A spell checker DOES NOT guarantee a good document. It only guarantees that the words in a document are spelled correctly.

TABS

Tabs are used to align characters in columns or to indent a paragraph. Tabs in word processing is conceptually the same thing as tabs on a typewriter.

TEXT

Text is what a document is made up of. Text refers to letters, numbers, special symbols and whatever else can be typed.

TEXT WINDOW

Many documents will be larger than the screen. If this is the case, the screen acts like a text window.

A text window shows as much information as will fit on the screen. It is necessary for any file wider than 80 characters or more than 25 lines long.

Moving the cursor far enough down will scroll the text window up. The converse is also true.

TYPE FACE

A type face defines how characters look. The major bulk of this document is done in a Times Roman type face. The charts and graphs are done in a Courier type face.

WHITE SPACE

White space is just that part of a page which contains no printing.

WIDOW/ORPHAN

A paragraph should have no less than two lines on any page. If a paragraph has one line on a page and the remainder of the paragraph is on the NEXT page, the one line by itself is called a widow. When all but one line of a paragraph is on one page and the remaining line is on the NEXT page, the single line is called an orphan.

WORD

Many word processors have a different definition of what a word is. A good definition of a word would be any string of characters surrounded by white space. That means that the last "word" of the previous sentence includes the period at the end of the line.

Some word processors define a word to be the text from the current cursor location to the next blank space.

WORD WRAP

All acceptable word processors have a feature called word wrap. Word wrapping is a process by which words that will not fit on the current line are moved to the next line.

WORD WRAP ALLOWS THE USER TO TYPE AN ENTIRE PARAGRAPH WITHOUT USING THE <ENTER> KEY!

FINAL NOTES

Always use two spaces after the punctuation at the end of a sentence.

When typing a document, the <enter> key should only be used in the following places:

1. At the end of a paragraph.
2. At the end of a short line. e.g. "DATE: 01/06/89".
3. On a blank line to make a blank line. These three rules have a blank line between them.

The blank lines between the above three rules were placed there by hitting the <ENTER> key.

Live by these three rules. Not following them will render many features of the word processor useless.

Hopefully this chapter has given you a good overview of the major word processing concepts. The next chapter applies these concepts to WordPerfect 5.0.

ASSIGNMENTS

1. Describe three uses, other than those discussed in this book, of a word processor. (15 points)
2. Describe 6 differences between using a word processor and using a typewriter. (10 points)

Chapter 4 -- WordPerfect Basics

WordPerfect is one of the best word processors available on the market today. Its features are both convenient and numerous. Examples are:

Spell checking, a built-in thesaurus, convenient creation of indexes and table of contents, integration of graphics, excellent printer support ...

This chapter will cover more features than will actually be used. The reason for doing this is to entice the user to experiment with the program. The basic structure is to list a feature, give the key strokes necessary to use the feature, give an example and list the formatting code entered by WordPerfect.

One IMPORTANT concept to get across early is that of CURSOR POSITIONING. Improper cursor positioning in WordPerfect will result in undesirable and counter productive results. For each command, the location of the cursor will be specified if necessary.

The next IMPORTANT concept is that of reveal codes. Most of the commands in WordPerfect involve the insertion of FORMATTING CODES. A formatting code affects the way a document appears on the screen and the printer. Since WordPerfect inserts formatting codes into the document, cursor location is crucial for proper results.

BASE FONT

Ctrl-<F8>F

This command allows the user to specify the font to use for printing. After typing this command, a list of all available fonts for the defined printer will be displayed. Use the selector bar to make a selection and press <enter> to accept the selection.

CURSOR POSITION: Point where new font should take affect.

CODE: [Font:]

EXAMPLE: [Font:Helv 12pt (Z)]

BLOCK

Alt-<F4> (or)
<F12>

These keys TOGGLE block mode on or off. See the discussion of block commands on page 25.

To define a block, position the cursor at the BEGINNING of the text for which the block is to be defined.

Press Alt-<F4> or <F12>.

Move the cursor to the desired end of the block. As the cursor is moved over the text, the text will become highlighted.

The following commands can be used on the block:

<delete> or <backspace> to delete the block.
Ctrl-<F4> or MOVE to move the block somewhere.
Shift-<F7> or PRINT to print the block.
<F6> or BOLD to bold the entire block.
<F8> or UNDERLINE to underline the entire block.

There are many others for which this command applies but is beyond the intended scope of the book.

CURSOR POSITION: Point where block should begin.
CODE: [Block]
EXAMPLE: Same as code.

BLOCK PROTECT

Shift-<F8>Y

A Block must already be defined.

Using block protect on a block will force WordPerfect to keep the entire block on the same page. If all lines in the block do not fit on the current page, the block will be page wrapped.

CURSOR POSITION: As defined by BLOCK (Alt-<F4>).
CODE: [Block Pro:On] at the beginning of the block.
[Block Pro:Off] at the end of the block.
EXAMPLE: [Block Pro:On]<Text>[Block Pro:Off]

BOLD

<F6>

F6 toggles bold on and off. Press the bold key and type the text to be bolded. Finally, turn it off by hitting the bold key again.

The cursor should be positioned at the place where bolding is to start.

If the text to be bolded is already typed, block the text (see page 36.) and hit the bold key.

CURSOR POSITION: Point where bolding is to begin and after last character to be bolded. i.e. it is pressed twice.

CODE: [BOLD] at the beginning of the bolded text.

[bold] at the end of the bolded text.

EXAMPLE: [BOLD]<Text>[bold]

CENTER

Shift-<F6>

The center key will center the text typed. Press the center key, type the text to be centered and press <enter> to finish centering.

The cursor should be positioned on the line where the centering will occur.

If the line of text to be centered is already typed, position the cursor at the beginning of the text, press the center key and move off the line.

CURSOR POSITION: On first letter to be centered.

CODE: [Cntr] at the beginning of the centered text.

[C/A/Flrt] at the end of the centered text.

EXAMPLE: [Cntr]<Text>[C/A/Flrt]

CENTER PAGE

Shift-<F8>PCY

The entire page will be centered according to the current page margins.

Press EXIT <F7> to return to the document.

The cursor should be at the top of the page which is to be centered.

CURSOR POSITION: At top of page to be centered.

CODE: [Center Pg]

EXAMPLE: Same as code.

CHARACTER DELETION

<backspace> deletes the character BEFORE the cursor. If insert mode is on, all characters after the cursor will move back to fill in the gap. If typeover mode is on the characters after the cursor will not move backwards.

<delete> deletes the character UNDER the cursor. All characters after the cursor will move back to fill in the gap in both insert and typeover modes.

ctrl-<end> deletes all characters from the current cursor location to the end of the line. Any characters on the next line, if in the same paragraph, will move up to fill in the gap.

ctrl-<backspace> deletes the current word. A word being all characters up to the next white space character and back to the previous white space character. This means that hitting ctrl-<backspace> in the middle of a word will delete the entire word.

ctrl-<PgDn> deletes all characters from the current cursor location to the end of the page. WordPerfect will ask the user to verify the command by asking "Delete remainder of page (Y/N)?". Press Y for yes or N for no. DO NOT hit the <enter> key.

If block mode is on, hitting <delete> or <backspace> will allow the entire block to be deleted. This will be confirmed with the question "Delete block? (Y/N)" Press Y for yes or N for no. DO NOT hit the <enter> key.

CURSOR POSITION: Depends on option used.

CODE: Does not apply.

EXAMPLE: Does not apply.

WordPerfect is a clean screen program which shows, as closely as possible, how the text actually looks when it is printed. There are no control codes or special symbols on the screen to clutter your text.

When you press most WordPerfect feature keys, a code is inserted into your text. These codes determine how your text looks on the screen and/or at the printer. For example, when you change your margins, type a footnote, or select page numbering, a code is inserted.

To see the codes and where they are located in the text, press Reveal Codes (Alt-<F3>).

The screen is split with a reverse-video bar. The bar is marked with triangles which represent the location of the tab settings. The same text is displayed in both windows, but the lower window (Reveal Codes screen) also displays the codes.

Since the Reveal Codes screen contains codes, text does not always wrap the same way in the Reveal Codes screen as it does in the Document Editing screen.

You can type characters, or use any of WordPerfect's features in the Reveal Codes screen.

Press Reveal Codes (Alt-<F3>) again to return to your normal screen.

Figure 6 Reveal Codes Information from WordPerfect Manual.

CODES¹⁹

The boxed text above is a direct quote from the WordPerfect manual, pages 322 and 323. It will be followed up with additional comments.

After hitting the Reveal Codes key, the screen will split as mentioned. The bottom half of the screen will look like complete gibberish until you become accustomed to it. It takes a LONG TIME to understand this screen. DO NOT get frustrated.

Cursor movement in the Reveal Codes screen is strange. There will be a cursor in the top half of the screen, where the regular document screen is, and the exact current cursor location will be denoted in the bottom half of the screen (the place where the formatting codes are) by highlighting the thing that the cursor is under. When the cursor is moved, the highlighted box in the bottom half of the screen will move along with it. The top half of the screen defines WHERE the cursor (the highlighted box) moves.

¹⁹Mastery of this command is essential to mastery of WordPerfect. Ask for a demonstration if necessary!!!

CURSOR CONTROL

WordPerfect uses the cursor keys to move right, left, up and down with the following exceptions:

1. The cursor cannot be moved above the document.
 2. The cursor cannot be moved below the bottom of the document. The <space bar>, <enter> key or typing must be used.
 3. If the cursor is at the right most edge of the line and the right cursor key is pressed, the cursor will move to the left end of the next line.
 4. If the cursor is at the left most edge of the line and the left cursor key is pressed, the cursor will move to the right end of the previous line.
- ▲ The <end> key takes the cursor to the end of the text line.
 - ▲ <home> <up arrow> takes the cursor to the top of the screen.
 - ▲ <home> <down arrow> moves the cursor to the bottom of the screen.
 - ▲ <home> <left arrow> moves the cursor to the left edge of the text line.
 - ▲ <home> <right arrow> moves the cursor to the right edge of the text line.
 - ▲ <PgUp> moves the cursor to the beginning of the previous page.
 - ▲ <PgDn> moves the cursor to the beginning of the next page.
 - ▲ <home> <home> <Up arrow> moves the cursor to the beginning of the document.
 - ▲ <home> <home> <down arrow> moves the cursor to the end of the document.
 - ▲ <home> <home> <home> <left arrow> moves the cursor to the absolute beginning of the line, before any text or formatting codes on the line.
 - ▲ <home> <home> <home> <up arrow> moves the cursor to the absolute beginning of the document, before any text or formatting codes.

EXIT

<F7>

This key is used frequently. Its function when at the document level is to leave WordPerfect. Follow these steps.

1. Hit <F7>. WordPerfect will ask:
Save Document? (Y/N)
2. Press Y for yes or N for no. **DO NOT PRESS <ENTER>!**
3. If Y is pressed, WordPerfect will ask for a file name. Type the file name to save the document under or press <enter> if the desired file name is already shown.

If N is pressed, go to step 7.

4. If the file already exists on the disk, WordPerfect will ask if it should be overwritten.
5. Press Y to overwrite the old file or N to not overwrite it. **DO NOT PRESS <ENTER>!**
6. If N is pressed, go back to step 3.
7. After the file has/has not been saved, WordPerfect will ask:
Exit WordPerfect? (Y/N)
8. Press Y to exit WordPerfect.

If N is pressed, WordPerfect will be reentered with a blank screen.

PAY ATTENTION TO WHAT WORDPERFECT IS TELLING YOU. This is the first major problem most people face when learning WordPerfect. Always follow the above steps to make your life easier.

To clear the current document without saving it and remain in WordPerfect type:

<F7>NN

CURSOR POSITION:	Does not apply.
CODE:	Does not apply.
EXAMPLE:	Does not apply.

ENDNOTE

Ctrl-<F7>E[Create][Edit]

Endnotes are notations placed in documents to cite references or make clarifications to the documents. All endnotes are placed at the end of the document in the order they appear in the document. To create an endnote, place the cursor where the endnote number should appear and type: **Ctrl-<F7>EC**

A blank screen will appear. Type the text of the endnote, using any of the regular formatting keys as needed. Press **<F7>** when finished. Note, do not press **<Enter>** at the end of the endnote or an extra blank line will appear between endnotes.

The numbers for the endnotes are created and maintained by WordPerfect.

If a mistake is made in an endnote, type: Ctrl-<F7>EE. Enter the number of the endnote to be edited and press <Enter>. The endnote will be displayed on the screen. Make any changes necessary and press <F7> to end editing of the endnote.

Endnotes cannot be seen unless page preview (Shift-<F7>V) is used, or the document is printed.

CURSOR POSITION: Point where number should appear in document.
CODE: [Endnote:<number>];[Note Num]<text of endnote>
EXAMPLE: [Endnote:1;[Note Num]This is an example endnote.]

FLUSH RIGHT Alt-<F6>

The flush right command will align everything typed with the right margin. i.e.:
This line is flushed right.

Press the <Flush> key, type the text and press <enter> to end the flushing. The cursor MUST be positioned at the beginning of the text for which the flush command will be used. If the text to be flushed is already typed, position the cursor at the beginning of the text to be flushed and hit the Flush Right key.

CURSOR POSITION: At beginning of text to be flushed.
CODE: [Flush Rt] at the beginning of the flushed text.
[C/A/Flrt] at the end of the flushed text.
EXAMPLE: [Flush Rt]<Text>[C/A/Flrt]

FONT Ctrl-<F8>

This key allows the user to change the appearance of characters in a document. You can change the size, attributes or font of characters from this key. After hitting , the following options will appear:

1 Size 2 Appearance 3 Normal 4 Base Font 5 Print Color

See the individual descriptions following.

FONT APPEARANCE Ctrl-<F8>A

This feature allows you to add different character attributes to a character. You can underline, bold, double underline, italicize ... from this menu. Your options in this menu are:

**1 Bold 2 Undrln 3 Dbl Und 4 Italc 5 Outln
6 Shadow 7 Sm Cap 8 Redln 9 Stkout**

The cursor is placed in between these codes and, as you type text, the text will appear differently on the screen. When the document is printed, WordPerfect will print the text in between the codes with the different attribute. Note that the meaning of Bold, Underline, Italic ... are printer dependent so you may not know exactly what to expect until you try it.

To use this feature, follow these steps:

1. Hit **ctrl-<F8>A**
2. Select the attribute. D double underline, a Shadow ...
3. Type the text which will be in the different size.
4. Hit **ctrl-<F8>N**

The last step means Normal. It will turn off underlining, bold, small text ...

FONT SIZE

Ctrl-<F8>S

This command allows a user to change the size of characters in a document. After hitting **ctrl-<F8>** the user will have the following options:

**1 Superscript 2 Subscript 3 Fine 4 Small
5 Large 6 Vry Large 7 Ext Large**

Selecting one of these options puts a pair of codes in the document. Example codes include:

Superscript	[SUPRSCPT][suprscpt]
Subscript	[SUBSCPT][subscpt]
Fine	[FINE][fine]

...

The cursor is placed in between these codes and, as you type text, the text will appear differently on the screen. When the document is printed, WordPerfect will print the text in between the codes in the different size. Note that the meaning of fine, small, large ... are printer dependent so you may not know exactly what to expect until you try it.

To use this feature, follow these steps:

1. Hit **ctrl-<F8>S**
2. Select the size, b for subscript, V for very large ...
3. Type the text which will be in the different size.
4. Hit **ctrl-<F8>N** to select normal text.

FOOTNOTE

Ctrl-<F7>F[Create][Edit]

Footnotes are notations placed in documents to cite references or make clarifications to the documents. All footnotes are placed at the end of the page they are on. To create a footnote, place the cursor where the footnote number should appear and type: **Ctrl-<F7>FC**

A blank screen will appear. Type the text of the footnote, using any of the regular formatting keys as needed. Press **<F7>** when finished. Note, do not press **<Enter>** at the end of the footnote or an extra blank line will appear between footnotes.

The numbers for the footnotes are created and maintained by WordPerfect.

If a mistake is made in a footnote, type: **Ctrl-<F7>FE**. Enter the number of the footnote to be edited and press **<Enter>**. The footnote will be displayed on the screen. Make any changes necessary and press **<F7>** to end editing of the footnote.

Footnotes cannot be seen unless page preview (**Shift-<F7>V**) is used, or the document is printed.

CURSOR POSITION:	Point where number should appear in document.
CODE:	[Footnote:<number>:[Note Num]<text of footnote>]
EXAMPLE:	[Footnote:1:[Note Num]This is an example footnote.]

HELP

<F3>

When the help key is pressed, the screen will clear and instructions for the help command will be displayed.

Pressing any letter will give a list of all help topics that begin with the typed letter. For example pressing **<F3>** then M will give the following display²⁰ (see Figure 7).

²⁰Figure 7 is copied directly from the help contained within WordPerfect 5.0

Pressing the key for the command, listed in the Key column, will give specific help on that key. For example hitting Shft-<F8> from the above list will give the following screen²¹(See Figure 8).

Key	Feature	Key Name
Ctrl-PgUp	Macro Commands	Macro Commands
Ctrl-F10	Macro Commands, Help on	Macro Definition
Ctrl-F10	Macro, Define	Macro Define
Ctrl-F10	Macro Editor	Ctrl-F10, Edit
Alt-F10	Macro Execute	Macro
Shft-F1	Main Dictionary(s) Location	Setup,7
Shft-F8	Manual Hyphenation	Format,1
Shft-Tab	Margin Release	Shft-Tab
Shft-F8	Margins - Left and Right	Format,1
Shft-F8	Margins - Top and Bottom	Format,2
Alt-F5	Mark Text	Mark Text
Alt-F5	Master Document	Mark Text,2
Alt-F7	Math	Math/Columns
Alt-F7	Math Define	Math/Columns
Shft-F1	Menu Letter Display	Setup,3
Ctrl-F9	Merge	Merge/Sort
Shft-F9	Merge Codes	Merge Codes
F9	Merge R	Merge R
Alt-F9	Minimum Offset from paragraph	Graphics,1,4
Ctrl-F4	Move	Move
F5	Move a File	List Files
Ctrl-F4	Move text	Move

Figure 7 Help on M

INDENT LEFT

<F4>

This key will indent an entire PARAGRAPH from the current cursor location to the next tab stop. This paragraph is an example of an indented paragraph. The right margin remains unaffected.

The cursor MUST be at the location where the indent is to take place.

This command causes word wrap to occur at the indented margin so this command is sometimes called a hanging paragraph or a temporary left margin.

²¹Figure 8 is copied directly from the help contained with WordPerfect 5.0

Format

Contains features which change the current document's format. Options on the Line, Page and Other menus change the setting from the cursor position forward. Document Format options change a setting for the entire document. To change the default setting permanently, use the Setup key.

- 1 - Line
- 2 - Page
- 3 - Document
- 4 - Other

Type a menu option for more help: Ø

Figure 8 Help on Shift-<F8>

CURSOR POSITION: Point where indentation should begin.

CODE: [→Indent]

EXAMPLE: Same as code.

INDENT LEFT & RIGHT

Shift-<F4>

This key will indent an entire PARAGRAPH from the current cursor location to the next tab stop. The difference between this command and the Indent left command is that the RIGHT MARGIN is also affected.

The cursor MUST be at the location where the indent is to take place.

CURSOR POSITION: Point where indentation should begin.

CODE: [→Indent←]

EXAMPLE: Same as code.

JUSTIFICATION

Shift-<F8>LJ[Left][Center][Right][Full]

That is, shift <F8> followed by L for line and J for justification. Finally, select the type of justification desired. The following are your options:

- L The left margin will be straight.
- R The right margin will be straight.
- C All text will be centered on the line.
- F Both the right and left margins will be straight.

The cursor MUST be positioned before the text for which the command is to take effect.

CURSOR POSITION: Point where justification should begin.
CODE: [Just:Left], [Just:Right], [Just:Center] or [Just:Full]
EXAMPLE: See CODE above.

LINE MARGINS

Shift-<F8>LM<Left margin><enter><right margin><enter>

That is, hold down the <shift> key, hit the <F8> key, type L for Line and M for margins.

<left margin> refers to the desired left margin. The unit for this number is in inches. 1 = 1".

<right margin> refers to the desired right margin. The number entered refers to the number of inches for the right margin. 1 = 1".

The line format screen will still be displayed after entering the right margin. Hit the EXIT <F7> key to get back to the document.

The cursor MUST be positioned before the text for which this command is intended.

CURSOR POSITION: Point where new margins should take effect.
CODE: [L/R MAR:<Left Margin>, <Right Margin>]
EXAMPLE: [L/R MAR:1", 1"]

LINE SPACING

Shift-<F8>LS<Number><enter>

That is, hold down the <shift> key, hit the <F8> key, type L for Line and S for Spacing.

Note that WordPerfect 5.0 uses mnemonic commands whenever possible. This aids in the memorization of commands.

<number> refers to the line spacing desired. 1 = Single spaced, 2 = double spacing and so on.

The line formatting menu will still be on the screen after hitting <enter>. Press <F7> to exit from the line formatting menu back to document editing. <F7> is called the EXIT key.

The cursor MUST be positioned before the text for which this command is intended.

CURSOR POSITION: Point where new line spacing should take effect.
CODE: [Ln Spacing:<number>]
EXAMPLE: [Ln Spacing:2]

LIST FILES

<F5>

The list files menu allows the user to copy, delete, print, move and rename files. Pressing <F5> will cause WordPerfect to prompt for a directory. It should look like this:
Dir B:*.*

Just press <enter> to accept this directory, or type another drive/directory to select another disk drive or directory.

All the files on the disk will be displayed two to a line. There will also be a large file selector bar. The cursor keys are used to move this selector bar to the desired file. Once the cursor is on the desired file, type the desired command.

The following commands apply:

- R Retrieve the file. Only retrieve files that were created with WordPerfect. The file will be retrieved. DO NOT RETRIEVE ONE FILE INTO ANOTHER. See above, page 51.
- D Delete the file. This is not always reversible, be careful!
- M Move the file to another disk or rename it. If this option is selected, WordPerfect will prompt for a new name. Type the new name and the file will be renamed.
- P Print the file selected. This will only work if the file is a WordPerfect file.
- L Look at a file without loading it. Pressing <enter> on a file name has the same effect as the look command. This option will not actually load the file. The file will be displayed on the screen. The message "Press exit when done" will be at the bottom of the screen!

Press EXIT <F7> to exit from looking at a document.

- C Copy a file. WordPerfect will ask for a disk or directory to copy the file to. Type a drive letter and press <enter>.

NEW PAGE NUMBER

Shift-<F8>PNN<page number><enter>

That is, shift F8 followed by P for page and N for page numbering and N again for new page number.

If a given page number is desired for a certain page, use this command with the cursor at the top of the page to assign it a new page number. The following pages will be numbered consecutively after the renumbered page.

If the document is a paper with a title page, this command should be used to guarantee that page one of the paper is actually numbered page 1 and not page 2 because it follows a title page.

CURSOR POSITION: Top of page where new page number should take effect.
CODE: [Pg Num:<number>]
EXAMPLE: [Pg Num:1ØØ]

NORMAL FONT

Ctrl-<F8>N

This command turns off any special character formatting. Characters typed after using this feature will be displayed normally on the screen and will be printed in the base font.

PAGE MARGINS

Shift-<F8>PM<top margin><center><bottom margin><enter>

That is, shift <F8> followed by P for page and M for margins.

<top margin> refers to the desired top of the page margin. The unit for this number is in inches. 1 = 1".

<bottom margin> refers to the desired bottom of page margin.

The cursor **MUST** be positioned at the **TOP** of the page for which this command is intended.

CURSOR POSITION: Top of page where new page margins should take effect.
CODE: [T/B Mar:<Top margin>,<Bottom Margin>]
EXAMPLE: [T/B Mar:1",1"]

PAGE NUMBERING

Shift-<F8>PNP[1][2][3][4][5][6][7][8][9]

That is, shift <F8> followed by P for page, N for page numbering, and P for position of page number. The number determines the position of the page numbering as follows:

- | | |
|--|-------------------|
| [1] top left | [5] bottom left |
| [2] top center | [6] bottom center |
| [3] top right | [7] bottom right |
| [4] top left of even pages and top right of odd pages. | |
| [8] bottom left of even pages and bottom right of odd pages. | |
| [9] no page numbers. | |

The cursor MUST be positioned at the top of the page where the page numbering should start.

If a document should be numbered for every page but the first, use the page numbering command on the first page and use the SUPPRESS command (see page 52) to turn page numbering off for the first page.

If a title page is included in the document the NEW PAGE NUMBER command (see page 49) may also be necessary.

CURSOR POSITION: Generally first page, excluding cover pages, of document.
CODE: [Pg Numbering:<Position>]
EXAMPLE: [Pg Numbering:Top Left]

PRINT

Shift-<F7>F print the entire document.
Shift-<F7>P print the current page.
Shift-<F7>G set graphics quality for printing.
Shift-<F7>T set text quality for printing.

To print the entire document, cursor positioning is unimportant. To print a specific page, however, the cursor must be on the page to be printed.

TO CANCEL ALL PRINTING, type the following:

Shift-<F7>CC*Y<F7>

CURSOR POSITION: Only matters for P option.
CODE: Does not apply.
EXAMPLE: Does not apply.

RETRIEVE

Shift-<F10>

Follow these steps:

1. WordPerfect will ask for a file name, type the file name to be retrieved.
2. If the file is not found, WordPerfect will say so.

If the file is not found go back to step 1.

Hit <F1> to cancel the command.

MAKE SURE THAT THE SCREEN IS CLEAR BEFORE RETRIEVING ANY

FILES! If this is not done, many files could be merged together. **DO NOT**
RETRIEVE A FILE UNLESS YOU ARE SURE YOU NEED TO. This is the second
major problem people have when learning WordPerfect.

CURSOR POSITION: This command is generally used with an empty document,
therefore cursor position is generally not important.

CODE: Does not apply.

EXAMPLE: Does not apply.

SAVE

<F10>

Follow these steps:

1. Hit <F10>,
2. WordPerfect will ask for a file name. Type the file name to save the document
under or press <enter> if the desired file name is already shown.

If the file already exists on the disk, WordPerfect will ask if it should be
overwritten.

3. Press Y to overwrite the old file or N not to overwrite it. **DO NOT PRESS**
<ENTER>!
4. If N is pressed, go back to step 1.

The location of the cursor is not important.

SPELL CHECK

Ctrl-<F2>[W][P][D][L][C]

Type:

- W to check a word,
- P to check the page,
- D to check the entire document,
- L to look up a word (WordPerfect will prompt the user for a word) or
- C to count the words in a document.

The key here is to pay attention to the bottom of the screen. If a misspelled word is found, WordPerfect will display guesses as to what the correct spelling of the word should be. Each word will have a letter by it. If the correct word is listed, type the letter of the word to replace the incorrect word with the correct word.

This command is best learned by using it.

To use the spell checker, the speller disk must be inserted in to the B: drive.

Follow these steps:

1. Replace the data disk in the B: drive with the speller disk.
2. Press Ctrl-<F2> and spell check the document.
3. When the document has been checked, REMOVE THE SPELLER DISK AND PUT THE DATA DISK BACK IN THE B: DRIVE.

Step 3 is VERY important, if neglected, the document may be saved on the wrong disk. If this happens it will be lost.

If the speller disk is not in the B: drive when ctrl-<F2> is pressed, the following message will result:

WP<WP>US.LEX not found: 1 Enter Path; 2 Skip Language; 3 Exit spell:3

Just press <enter> and go back to step 1 above.

CURSOR POSITION:	Only matters for P option.
CODE:	Does not apply.
EXAMPLE:	Does not apply.

SUPPRESS

The suppress command is used to turn off any of the following for one page: Page numbering, footers, headers, page numbering. This feature is generally used to treat the first page of a paper differently from the rest.

To use the suppress command, type:

Shift-<F8>PU[<Option>]

Where <Option> can be any of the following:

- a Suppress all page numbering, headers and footers.
- s Suppress headers and footers.
- b Print page number at bottom center.
- p Page numbering.
- h Header A.
- e Header B.
- f Footer A.
- o Footer B.

CURSOR POSITION: Top of page where suppressing should occur.

CODE: [Suppress:<Options>]

EXAMPLE: [Suppress:HA,HB]

UNDERLINE

<F8>

F8 toggles underline on and off. Press the underline key and type the text to be underlined. Finally, turn it off hitting the underline key again.

The cursor should be positioned at the place where underlining is to start.

If the text to be underlined is already typed, block the text (see page 36.) and press the underline key.

CURSOR POSITION: Point where underlining should begin.

CODE: [UND] at the beginning of the underlined text.

[und] at the end of the underlined text.

EXAMPLE: [UND]<Text>[und]

WIDOW/ORPHAN

Shift-<F8>LW[Y][N]

That is, shift <F8> followed by L for line and W for Widow/Orphan protect.

Type Y for yes (turn on widow orphan protect) or N for no. (turn it off) Press the EXIT <F7> key to return to the document.

The cursor MUST be positioned at the top of the page for which this command is to begin taking effect.

CURSOR POSITION: Generally at top of document.
CODE: [W/O On] or [W/O Off]
EXAMPLE: Same as code.

This ends the list of commands to be covered. This merely touches the surface of what WordPerfect can do. Tabs will not be covered since this tends to make matters worse. Tabs are set every half inch by default. The tab key uses the default tab settings which are used most of the time, therefore tabs are not being covered.

ASSIGNMENTS

ASSIGNMENT #1:

For each question describe:

the commands to accomplish the task,
the cursor positioning,
and the SPECIFIC code entered into the document.

Note that these questions are NOT to be performed.

Assume each question is applied to an empty document unless reference to a previous question is made.

- a. Set the left and right margins to 1.5" for the entire document. (2)
- b. Set the top margin to 1.75" and the bottom margin to 1" starting at the second page of a document. (2)
- c. Turn justification on for an entire document. (2)
- d. Put a page number at the bottom center of every page starting at the second page of a document. (3)
- e. Retrieve a file called INTRO.BK. (2)
- f. Print the entire document retrieved in question e. (2)
- g. Print page 9 of the document retrieved in question e. (2)
- h. Retrieve the document called LABMAN.INT. Make sure to clear the document (without saving it) from question e. (3)
- i. Delete the second paragraph of a document. (4)
- j. Describe how to double space an entire document. (2)
- k. Describe how to center a line of text as you type it. (2)
- l. Describe how to center the first page of a document. (2)
- m. Describe how to underline a word which has already been typed. (2)

- n. Describe how to save a document and clear the screen. (2)
- o. On what line numbers of the document in Figure 9 should the <enter> key be used? Note that the line numbers are there only for reference. (5)

```
1                               Brett L. Schuchert
2                               Wouldn't you like to know,
3                               Iowa City, IA. 5224?
4
5   August 20, 1989
6
7
8   TO:     Somebody
9   FROM:   Someone else
10  RE:     Anything.
11
12  Dear Somebody,
13
14  You have been selected as the recipient of the
15  award for outstanding achievement in any field.
16  We here at the committee congratulate you.
17
18  Sincerely,
19
20
21
22  Somebody else.
```

Figure 9 <Enter> Assignment

- p. Describe how to retrieve a file called WORDPERF.BK using list files. (<F5>). (3)

ASSIGNMENT #2:

Refer to Figure 10 for all questions.

```
[T/B Mar:2",2"] [T/B Mar:1.5".1.5"] [T/B Mar:0.75",0.75"] [L/R Mar:1.5",1"] [L/R Mar:2",2"] [L/R Mar:1",1.5"] [L/R Mar:0.75",0.75"] This is paragraph #1.....[HRt]  
[L/R Mar:1",1"] [L/R Mar:4",3"] [Ln Spacing:2] [L/R Mar:2",1"] [L/R Mar:1",1"] This  
is [UND]paragraph[und] #2.....[HRt]  
[Just On] [Tab] This [UND][und]is[UND][und] paragraph #3.....[HRt]  
[→Indent] This is paragraph #4.....[HRt]
```

Figure 10 - Codes from hell.

- a. What are the line margins for each of the four paragraphs in Figure 10? (Note that they may be different!) (4)
- b. What are the page margins for this document? (1)
- c. Which paragraphs will be printed with justification? Which paragraphs will not be printed with justification? (4)
- d. How many words are underlined in this document? What are the word(s) that are underlined? (3)
- e. If paragraph #3 is several lines long, how will the first line differ from the rest of the paragraph? (2)
- f. If paragraph #4 is several lines long, how will the first line differ from the rest of the paragraph? (2)
- g. What will the line spacing be for each of the four paragraphs? (Note that the line spacing may be different!) (4)

Chapter 5 -- WordPerfect Tutorial

This tutorial will take you through creating, saving, printing and editing a short document. You will create the following figure:

	Brett L. Schuchert 2821 Old Highway 218 Iowa City, IA. 52240 December 5, 1990
Apple Computer, Inc. Human Resources, MS: 81-ST Dept. CE10300P Cupertino, CA. 95014	<p>Dear Personnel Director,</p> <p>This letter is in response to your advertisement at COPSIA '90 regarding positions involving research and development of development environments. I am devoted to both the development of such environments as well as the training of individuals in the use of such environments, and I have related experience in both.</p> <p>I will receive my B.S. in Computer Science at The University of Iowa in May, 1991. My coursework in object-oriented programming and design using Smalltalk provided the foundation for my position as a Research Assistant at The Center for Computer Aided Design, University of Iowa. In this position, I collaborated in the design and implementation of a Mechanical Engineering design and analysis package for use by Ford Motors, TACOM, and other such companies. We utilized an object-oriented design philosophy, and have used C++ to implement the majority of the system.</p> <p>During my tenure as an instructor at Kirkwood Community College, I have developed and redesigned the curriculum for Introduction to Micro-Computers and Data Processing, WordPerfect Word Processing, Micro-Computer Utilities, Micro-Computer Communications, Micro-Computer Spreadsheets and Micro-Computer Data Bases, as well as authored a comprehensive instructional manual for use in Introduction to Micro-Computers and Data Processing. I have had the opportunity to expand on the traditional classroom environment to include small group and individualized training/skills development as well.</p> <p>My experience as an instructor at KCC and as a Teaching Assistant for the University of Iowa has enabled me to develop my skills as an instructor of a diverse population of individuals with a wide variety of levels of expertise. This, coupled with my programming experience and enthusiasm for object-oriented programming, could benefit Apple in the design of new environments. I would also be effective at developing training methodologies for these new environments and would be an effective trainer of such environments.</p> <p>In summary, I am fluent in C++ and have object-oriented design and programming experience. I have several years experience teaching and training at many different levels of expertise. I have worked with software development environments such as the Smalltalk environment, and have also developed under Unix. I am a very easy going person, get along well with people and have good communication skills. I believe that working at Apple would be a mutually beneficial relationship, and would like the opportunity to discuss this with you in more detail.</p> <p>Thank you for your consideration, and I hope to hear from Apple Computer at your earliest convenience.</p> <p>Sincerely,</p> <p>Brett L. Schuchert (319) 351-6268</p> <p>Enclosure</p>

Figure 11 Cover Letter

Follow these steps:

1. Get into WordPerfect. (See page ?.)
2. To enter the first address do the following:
 - a. Press <tab> 8 times.
 - b. Type:
Brett L. Schuchert<enter>

If the last word of this line wraps to the next line, move the cursor to the "B" in Brett, and type <BackSpace>. Also, use 7 tabs for remainder of this step.

 - c. Press <tab> 8 times, and type:
2821 Old Highway 218<enter>
 - d. Press <tab> 8 times, and type:
Iowa City, IA 52240<enter>
 - e. Press <tab> 8 times, and type:
December 5, 1990<enter>
3. Make a triple space by typing <enter> two times.
4. Type:
Apple Computer, Inc.<enter>
Human Resources, MS: 81-ST<enter>
Dept. CE103OOP<enter>
Cupertino, CA. 95014<enter>
<enter>

Notice that <enter> is typed after each of these "short" lines.

5. Type:
Dear Personnel Director,<enter>
6. Press <enter> once more to get a double space.

7. Type:

This letter is in response to your advertisement at OOPSLA '90 regarding positions involving research and development of development environments. I am devoted to both the development of such environments as well as the training of individuals in the use of such environments, and I have related experience in both.<enter>

Notice that <enter> was only typed after the ENTIRE paragraph was entered. Also notice that your version is several lines longer and the lines end with different words. This is OK! You are using a different font than the one in the figure.

8. Press <enter> again to get a double space.

9. Type:

I will receive my B.S. in Computer Science at the University of Iowa in May, 1991. My coursework in object-oriented programming and design using Smalltalk provided the foundation for my position as a Research Assistant at The Center for Computer Aided Design, University of Iowa. In this position, I collaborated in the design and implementation of a Mechanical Engineering design and analysis package for use by Ford Motors, TACOM, and other such companies. We utilized an object-oriented design philosophy, and have used C++ to implement the majority of the system.<enter>

10. Press <enter> to get a double space.

11. Type:

In summary, I am fluent in C++ and have object-oriented design and programming experience. I have several years experience teaching and training at many different levels of expertise. I have worked with software development environments such as the Smalltalk environment, and have also developed under Unix. I am a very easy going person, get along well with people and have good communication skills. I believe that working at Apple would be a mutually beneficial relationship, and would like the opportunity to discuss this with you in more detail.<enter><enter>

12. Type:

Thank you for your consideration, and I hope to hear from Apple Computer at your earliest convenience.<enter><enter>

13. Type:

Sincerely,<enter>

14. Press <enter> three more times for a quadruple space.
15. Type:
Brett L. Schuchert<enter>
(319) 351-6268<enter>
16. Press <enter> again for a double space.
17. Type:
Enclosure<enter>
18. The first version of the letter is finished (we will add the final two paragraphs later). Go back and carefully proofread the document.
19. Now save the document. The filename will be COVERLET. Type:
<F10>coverlet<enter>
20. Next, print the document. Make sure the paper is aligned properly (see page 6.) Type:
Shift-<F7>F
21. The letter is missing two paragraphs. Move the cursor to the BEGINNING of the paragraph which reads "In summary, I am fluent in C++...".

NOTICE while you type the next paragraph that the paragraph beginning "In summary, I am fluent in C++..." is pushed over and down. This is called insert mode.
22. Type:
My experience as an instructor at KCC and as a Teaching Assistant for the University of Iowa has enabled me to develop my skills as an instructor of a diverse population of individuals with a wide variety of levels of expertise. This, coupled with my programming experience and enthusiasm for object-oriented programming, could benefit Apple in the design of new environments. I would also be effective at developing training methodologies for these new environments and would be an effective trainer of such environments.<enter><enter>

Notice that adding this paragraph simply involved positioning the cursor WHERE the new paragraph belonged and then typing the new paragraph.

23. Add the final paragraph by typing:

During my tenure as an instructor at Kirkwood Community College, I have developed and redesigned the curriculum for Introduction to Micro-Computers and Data Processing, WordPerfect Word Processing, Micro-Computer Utilities, Micro-Computer Communications, Micro-Computer Spreadsheets and Micro-Computer Data Bases, as well as authored a comprehensive instructional manual for use in Introduction to Micro-Computers and Data Processing. I have had the opportunity to expand on the traditional classroom environment to include small group and individualized training/skills development as well.<enter><enter>

24. Print the document with these added paragraphs. (See step 20.) Note that this printout will be 2 pages long.
25. Save the document before doing the next step, just in case a mistake is made. (See step 19.)

Since this document has already been saved once, WordPerfect will ask "Replace B\COVERLET? (Y/N)".

Press Y to save the current version of the document. DO NOT PRESS <enter>!

26. The last two paragraphs entered were typed in the wrong order. We must therefore move the paragraph beginning "My experience as an instructor at KCC..." AFTER the paragraph beginning "During my tenure as an instructor at Kirkwood...". Do the following (this is going to be difficult!).
- Position the cursor at beginning of the line that begins "During my tenure as an instructor at Kirkwood...".
 - Hit the block key. (Alt-<F4>)
 - Move the cursor down to the BEGINNING of the line that begins "In summary, I am fluent in C++".
 - Press the MOVE key. (Ctrl-<F4>)
 - Type:
B

For BLOCK.

f. Type:
M

For MOVE.

WordPerfect will tell you to position the cursor WHERE the paragraph should be moved and then press (DO NOT DO THIS YET!) <enter>.

g. Put the cursor at the beginning of the paragraph which starts "My experience as an instructor at KCC ...".

h. Press <enter>

Your document should now resemble the document in Figure 11. If it does not, do the following:

i. Clear the current document without saving it (it was saved in step 25 just in case.)
Type:

<F7>NN

j. Retrieve the document. Type the following:
Shift-<F10>

Then type the name of the file if it is not already there. The name of the file is COVERLET.

k. Go back to step 26.a.

27. Once your letter matches the one in the book, print the new version of the letter. (See step 20.)

28. Save the final version of the letter. See step 25.

29. Clear the screen with the following command:
<F7>NN

30. Retrieve the file for practice. (REMEMBER, when retrieving a file the screen MUST be clear. If not, two or more documents will be merged together.) To retrieve the file, use the List Files menu.

Hit <F5><enter>

On the screen will be two columns of file names. Find coverlet and position the selector bar over it.

31. Press <enter> to LOOK at the file. When done, press <F7>
32. Next, press R to actually retrieve the document. Step 31 just looked at the file, it was not retrieved.
33. Look through the document and fix any errors. Try spell checking it. Now is the time to experiment because the file is saved and the tutorial is over.
34. To quit out of WordPerfect (without saving the current document), type the following:

<F7>NY

(See page 40.)

Total Points: 30.

Chapter 6 -- WordPerfect Assignments

ASSIGNMENT #1

22C:196 Project Description: Simulating a Computer System

GOAL

The goal of this project is to produce a visual simulation of a computer system. This simulation will allow a user to view the hardware components of a system and examine different algorithms used by the systems software to control the hardware.

The major emphasis of the project is threefold:

1. Each component of the total system will be prototyped in terms of the services it provides and how it interfaces into the other components.
2. Each component must provide a mechanism for graphical viewing.
3. Each component should allow an end user to add/replace algorithms for its services.

GENERAL OUTLINE

This project consists of several open ended phases. The approach we will use is that of rapidly prototyping and then iterating over the system. The first three suggested phases follow:

PHASE I:

Define the Classes and Methods necessary to implement on a stand alone basis the following components:

...

Figure 12 WordPerfect Assignment #1

Instructions:

- a. Create the document contained in Figure 12. You should use the <Center> and <Indent> commands.
- b. Print the document. (15)
- c. Change the line margins to 1.5" each.
- d. Print the document. (5)
- e. Change the Base Font to 12 CPI (elite or a 10 point font).
- f. Print the document. (5)

ASSIGNMENT #2

1.	Organizational notes:		
a.	Handouts		
i.	Lab Rules		
ii.	Running WordPerfect		
iii.	Running SC4		
iv.	Running dBase		
b.	Two people per session		
i.	Lecturer		
ii.	Question answerer		
c.	12 Seats/Session MAX		
d.	Each session is 1.5 hours long.		
e.	Hand out sign in sheet. Include Name, SSN, Section (Time)		
f.	Dates	Times	People
	1/18/90	4 p.m.	Deb/Kev
		6 p.m.	Kev/Jeff
	1/19/90	4 p.m.	Kev/Deb
		6 p.m.	Kev/Jeff
	1/20/90	1 p.m.	Bob/Wayne
		4 p.m.	Bob/Wayne
	1/22/90	3 p.m.	Kev/Deb
		6 p.m.	Deb/Kev
	1/23/90	6 p.m.	Gary/Brett
		8 p.m.	Gary/Brett
	1/24/90	6 p.m.	Wayne/Jeff
		8 p.m.	Jeff/Wayne

Figure 13 WordPerfect Assignment #2

Instructions:

- a. Create the outline contained in Figure 13. You will use tabs and the <indent> command.
- b. Print the document. (15)
- c. Change the line margins to 2" each.
- d. Add a page number.
- e. Print this document. (5)

ASSIGNMENT #3**ORGANIZATIONAL NOTES**

Since the last personal writeup our group has met several times and there have been several readjustments. Specific organizational changes include:

1. Setting up 3 fixed meeting times during the week. Each person MUST make 2 of 3 meeting times AND show up for the group meeting with you. Missing more than one meeting per week constitutes a noodle lashing.
2. We started taking notes at each of our meetings.
3. Assigned Darren the task of image management since he has saved the image so many times.
4. Started meeting deadlines. For example each of us was to read the paper "Actors: A conceptual Foundation for Concurrent Object-Oriented Programming" by December 13, 1989.
5. We started making lab reservations so that two people would not try to work on different things at the same time.
6. We lost Ned for a few weeks which forced us to reorganize the work load.
7. We decided on a tentative outline for our group discussion. Each person has been assigned the task of researching their part of the outline. The current outline represents a rehash of our original idea. We decided that some of the things we were to talk about did not apply to the Actor model. For example, we were going to discuss development environments and compare Actors (a specific Actor language) to Smalltalk, C++ and Turbo Pascal 5.5, but the development environment is not really defined for an Actor system. The development environment also does not have anything to do with concurrent systems, which is what the Actor paradigm was originally developed for.

Figure 14 WordPerfect Assignment #3

Instructions:

- a. Create the document in Figure 14 using standard margins. Print the document. (15)
- b. Change the order of the third and sixth paragraphs. (Remember to change the numbers.)
- c. Change all paragraphs from tabbed to indented.
- d. Change the line margins to 2" each and Print the document. (15)
- e. Change the font to a font of your choice. (Warning, the italicized heading may change.)
- f. Turn on full justification.
- g. Print the document. (5)

ASSIGNMENT #4

Name centered and bold or emphasized somehow.
<blank line>
Full address in regular type.

GOAL

Some goal here.

SKILLS AND AREAS OF KNOWLEDGE/TRAINING

List your skills. Give an overview with some details. Avoid full sentences.

WORK EXPERIENCE

JOB 1, where it was. Elaborate EVERY detail. Assume the person reading knows little about the various responsibilities of the job. Date of job.

EDUCATION

Present

Future

HONORS/SCHOLARSHIPS/AWARDS

INTERESTS

REFERENCES

Figure 15 Resume Assignment

Instructions:

- a. Create your own personal resume. Use whatever formatting you want. You may use Figure 15 as a skeleton.

Avoid full sentences, use as few words as possible to get the point across.

(20 points)

Chapter 7 -- Advanced WordPerfect Features

INTRODUCTION

The purpose of this chapter is to introduce you to two of the advanced features of WordPerfect. The features covered will be outlining and merging. The best approach to learning the material in this experimental chapter is to read an entire subject, skimming over the tutorials, and then do the tutorials in one setting.

Each section of this chapter will follow the same basic outline:

- A. Introduction to the concept.
- B. General steps necessary for outlining or merging.
- C. A simple (tutorial) example.
- D. Define the details covered in the example.
- E. Review the steps adding any missing details.
- F. Finish up with another (tutorial) example.

OUTLINING

- I. Outlining
 - A. What is an outline?
 - B. General steps necessary to create one.
 - C. Simple example of creating one.
 - D. Defining an outline.
 - 1. Starting paragraph number.
 - 2. Different numbering styles.
 - E. How <Tab> and <Indent> work.
 - F. Changing the level of an outline.
 - G. Adding/Deleting entries in an outline.
 - H. Changing the type of outline.
- II. Merging
 - A. What is merging?
 - B. Define secondary files and primary files.
 - C. Simple example.
 - D. Basic Merge Codes.
 - 1. ^Fn^
 - 2. ^R
 - 3. ^E
 - E. Steps for creating a merge.
 - F. Another example.

Figure 16 Initial outline for this chapter.

Outlining is a feature of WordPerfect which allows an outline to be created and easily updated. Examples of where outlines are useful include listing the order of a term paper, the logical ordering of chapters in a book, a multiple guess exam or even an outline for this chapter. See Figure 16, Figure 22 for a specific example of an outline.

Outline Definitions

LEVEL

The level of a paragraph is the number of tab stops (minus 1) the paragraph is located in from the left margin. The left margin is level 1 while the first tab stop is level 2, the second level 3 ...

The level of the paragraph along with the outline style determines the numbering style used for a given level.

Paragraph Number Definition									
1 - Starting Paragraph Number (in legal style)		1							
		1	2	3	4	5	6	7	8
2 - Paragraph	1.	a.	i.	(1)	(a)	(i)	1)	a)	
3 - Outline	I.	A.	1.	a.	(1)	(a)	i)	a)	
4 - Legal (1.1.1)	1	.1	.1	.1	.1	.1	.1	.1	
5 - Bullets		-	■	*	+	.		x	
6 - User-defined									
Current Definition	I.	A.	1.	a.	(1)	(a)	i)	a)	
<u>Number Style</u>	<u>Punctuation</u>								
1 - Digits	#	- No punctuation							
A - Upper case letters	#.	- Trailing period							
a - Lower case letters	#)	- Trailing parenthesis							
I - Upper case roman	(#)	- Enclosing parentheses							
i - Lower case roman	.#	- All levels separated by period (e.g. 2.1.3.4)							
Other character - Bullet									

Selection: Ø

Figure 17 Different outlining Styles

OUTLINE STYLE

The outline style determines how different levels in an outline are labeled. See Figure 17²² for the outline define screen.

Notice that the Outline option, as listed in Figure 17, was used when creating Figure 16, Figure 22.

PARAGRAPH

A paragraph is the text contained after the paragraph number. Examples of paragraphs in Figure 16, Figure 22 include:

- Outlining
- Merging

Notice that these "paragraphs" are only one word long. A paragraph begins at the paragraph number and ends at the [HRT] (hard return) after the text of the paragraph.

²²Note that Figure 17 has been slightly modified to allow usage of an elite font in the figure.

PARAGRAPH NUMBER

The paragraph number is the number contained on the first line of a paragraph contained in an outline. Examples of paragraph numbers in Figure 16, Figure 22 include:

- I.
- A.
- B.
- II.

Note that there are different numbering styles for each tab stop.

SECTION

A section is a term added to facilitate later discussion. The term is defined as all paragraphs from a given paragraph up to but not including the next paragraph at the same level. In Figure 16, Figure 22 section I includes the lines

- I. Outlining
 - ...
 - H. Changing type of outline.
- and all lines in between.

Creating an Outline

There are 3 steps necessary to create an outline. Note that all three steps MUST be performed to assure the outline feature works.

1. Define the outline. Defining an outline includes the following:
 - a. Define the starting paragraph number. The starting paragraph number for this outline is 1.
 - b. Define the numbering style.
2. Turn on the outline feature. (When you do this, the word "Outline" will be placed on the lower left hand side of the screen.)
3. Type the outline. There are four keys which have special meaning while the outline feature is on. These keys are:
 - a. <Enter> Create a new outline number.
 - b. <Tab> Move the current outline number in one level.
 - c. Shift-<Tab> Move the current outline number back one level.
 - d. <Indent> Fix the level of the current outline number and move the cursor into the next level.

Now would be a good time to do the tutorial which begins on page 86.

<Tab>, <Indent> and Level Shifting

After performing the tutorial which started on page 86 you probably noticed that <Tab> was used on most of the lines and <Indent> was used on every line. The <Tab> key increases the levels and <Indent> fixes the levels, but what if you accidentally hit <Indent> too soon or maybe you hit too many tabs? How do you shift the level of a paragraph?

There are three ways to shift levels. First, you delete the paragraph number with the <Backspace> key, move up to the previous line, hit <Enter> and redo the level altogether. This method works fairly well unless you want to change the level after typing the paragraph.

Another way to change levels is to do the following:

- e. Place the cursor at the beginning of the paragraph number. What I mean by "at the beginning" is:
II. or B. or (1).
- f. Use <Backspace> to move the level back one or use <Tab> to move the level in one. i.e. <Backspace> changes a level 3 entry to a level 2 while <Tab> would change the same level 3 entry to level 4.

The final way to move the level BACK is to do the following:

- a. Place the cursor at the end of the paragraph number. What I mean by "at the end" is:
II._ or B._ or (1)_.
- b. Hit Shift-<Backspace> to move the level back one tab stop. Shift-<Backspace> moves a level 3 entry to level 2, level 2 to level 1 ...

What about the case where you hit <Indent> too soon? Just hit <Backspace> to remove the <Indent> and continue to hit the <Tab> key as necessary.

One thing to notice when attempting to move these paragraph numbers is that you CANNOT place the cursor anywhere on the paragraph number except the FIRST character of the paragraph number. The cursor will always jump over any punctuation at the end of the paragraph number. In step a. just above it is not possible to place cursor anywhere but on the underlined character. The following conditions will never happen:

II. or II. or B. or (1) or (1)

If you can place the cursor on the punctuation after the paragraph number or any other part of the paragraph number other than the first character then you do NOT have a paragraph number. It was typed by hand.

Adding or Deleting Outline Entries

One of the primary advantages of using the outline feature is that when entries are added²³ to or removed from an outline, the entire outline renumbers itself automatically²⁴. Another big plus for using the outline feature is that when paragraphs are moved within the outline, the entire outline renumbers itself. More on moving later, for now we'll stick to adding and deleting paragraphs in an outline. The easier of the two, deletion, will be covered first.

The key to deleting a paragraph from an outline is proper cursor positioning. The cursor SHOULD be placed at the beginning of the line (all the way to the left margin) to begin with. After the cursor has been placed, use the block delete command. To actually delete a paragraph from an outline follow these steps:

- a. Position the cursor at the beginning of the paragraph to be deleted. To do this, put the cursor anywhere on the text line and press <Home> <Home> <Left arrow>.
- b. Turn on block by pressing Alt-<F4>.
- c. Move the cursor, line by line, over the paragraph to be deleted. The end cursor position should be at the beginning of the line following the last line of the paragraph to be deleted. The cursor will probably be at the beginning of a new paragraph which is alright.
- d. Hit the <Delete> or <Backspace> key to delete the highlighted paragraph. Confirm the deletion with Y for yes.

If you don't quite follow this now, don't worry. This method of deletion will be covered in the next tutorial.

Adding a paragraph or paragraphs to an outline requires that outline mode is ON. Here again cursor positioning is important and it is DIFFERENT than for deleting a paragraph. To add a paragraph to an outline, do the following:

²³With the outline feature on.

²⁴Though on long outlines individual paragraph numbers may not immediately renumber but wait until the cursor has been moved past them.

- a. If outline mode is NOT on, turn it on with Shift-<F5>O.
- b. Position the cursor at the END of the line you wish to insert AFTER.
- c. Press <Enter> to get a new paragraph number.
- d. Press <Tab> to move the paragraph number to the proper level.
- e. Press <F4> to set the paragraph level.
- f. Type the paragraph but DO NOT PRESS <Enter> unless you want to add ANOTHER paragraph after the one you just added. If you wish to add another paragraph after the one you just added go ahead and press <Enter>. If you wish to add another paragraph somewhere else, go back to step a.

When you are done, you should remember to turn off the outline mode with Shift-<F5>O (remember that it's a toggle command).

Here again, if you didn't follow these instructions don't panic. They will be covered in the next tutorial.

Now would be a good time to do the tutorial which begins on page 92.

Moving Paragraphs

Not only can you add or delete paragraphs but you can also move paragraphs. When you move paragraphs, the outline renumerates itself as expected. This section discusses how to move paragraphs and some tips on cursor positioning.

To move the paragraph or paragraphs you need to determine two things. First, what is the scope of the move. Are you going to move an entire section (Level 1 and all paragraphs under that level) or just one paragraph. Second, where are you moving this paragraph to. Are you moving it after another section, adding a paragraph to a section ...

If this sounds familiar, it should. Moving paragraphs in an outline is similar to moving regular paragraphs of text. The primary differences are cursor positioning, which is more critical and the fact that paragraphs will be renumbered in an outline when moved.

Follow these steps to move paragraphs:

- a. Move the cursor to the BEGINNING (before the paragraph number) of the paragraph or section to be moved.

- b. Turn on block with Alt-<F4>.
- c. Block the paragraph or section to be moved.
- d. Press Ctrl-<F4>BM
That's <Move> Block Move.
- e. Position the cursor ON the line where the paragraph should be moved to. Also make sure the cursor is at the BEGINNING of the line.
- f. Press <Enter> to complete the move.

Don't worry if you didn't follow all of that, it will be covered in the final tutorial on outlines.

Changing the Outline Type

There are different outline types for various specific situations. Reviewing Figure 17 shows a Legal numbering style, a standard paragraph numbering style, bullets, outline style and others. You may have a preference for one type or a specific need. Whatever the case you can either, when defining an outline, select one of these specific styles or you can change the style of an existing outline. Since selecting a style at definition time is fairly simple I will just cover changing the level numbering style or type of outline.

Changing a paragraph type involves the following steps:

- a. Find the place where the paragraph was originally defined and specifically locate the [Par Num Def] code. If you can't easily find the code, use the following steps:
 - i. Hit <Search> (<F2>).
 - ii. Hit Shift-<F5>D.
 - iii. Hit <Search> (<F2>).

You should recognize this as a standard search. The only possibly new concept is that of searching for a code. By typing the outline define command while in the <Search> command, you can search for specific codes. This works with most codes.

- b. Place the cursor just after the code (you'll need to use Reveal Codes (Alt-<F3>)).
- c. Use the outline define command to change the paragraph type.
- d. Delete the original [Par Num Def] code.

Don't worry if you didn't follow all of that, it will be covered in the final tutorial on outlines.

Now would be a good time to do the tutorial which begins on page 96.

MERGING

Merging, or mail merge, is a feature available in most word processors where the user is able, for example, to create a form letter, and insert several different addresses into that form letter.

Merging takes two source files, typically a letter and a list of names, for example, and reproduces the letter inserting names at user specified locations.

Figure 19 contains a merge letter, called a primary file, while Figure 18 contains the names to be used in the merge, called a secondary file. Several things to notice in these two figures are the following: ^F1^, ^F2^, ^R, ^E and the lines of equal (=) signs. These are merge codes used to define what data should be used in the primary letter, and the structure of the data in the secondary file. These codes will be covered following some definitions.

Larry^R Larry Targeniz^R 2213 12th Street^R Downers Grove, IL 55332^E
Shawn^R Shawn Olson^R 30 S. Johnson, Apt 4^R Iowa City, IA 52240^E
Mary^R Mary Farlthon^R Main Street^R Chicago, IL 66402^E
Charles^R Charles Bargdon^R 1200 W. Benton^R Iowa City, IA. 52240^E

Figure 18 A Secondary File

Merge Definitions

FIELD

A record is made up of fields. A field either begins at the beginning of a record or after a ^R within a record. In the records in Figure 18 there are four fields to each record. As already mentioned, there should be the same number of fields per record in a given secondary file.

Fields are consecutively numbered from 1. In Figure 18 the first line of each record is field 1, the second line of each record is field 2 ... In Figure 18, these fields represent the following:

Field 1 - First Name, Field 2 - Full Name, Field 3 - Street Address, Field 4 -City State and Zip of the person.

Fred's Magazine 4551 Business Lane Cedar Rapids, Iowa 52406
January 6, 1990
^P2^
^F3^
^F4^
Dear ^F1^,
<Insert Generic Sales Message Here>
<Insert Generic Closing>

Figure 19 Example Primary File

MERGING

Merging is performing the action of bringing two files (a secondary and primary file) together into one file. If both files were created correctly, all field inclusion merge codes (^F1^, ^F2^ ...) will be replaced by lines of text which exist in the secondary file.

NOTE that merging does not change the secondary or primary files; it creates a new file.

PRIMARY FILE

The primary file in a merge contains the bulk text of the document to be merged. Figure 24 contains an example of a merge file. Notice the ^F1^, ^F2^ ... These special merge codes will be replaced by names contained in the secondary file.

RECORDS

A record is a complete set of information about some object. In the case of Figure 18, a record contains a First name, Full name, Street address and City (State, Zip) line. A record begins either at the beginning of a secondary file or just after a ^E[HPg]²⁵ (Hard Page) combination. In Figure 18 there are four records.

Records are made up of an arbitrary number of fields, though records in a given secondary file should contain the same number of fields.

SECONDARY FILE

The secondary file in a merge contains the text to be inserted into a primary file. Figure 18 contains an example merge file. The secondary file consists of records and fields which may be used in a merge.

Merge Codes

Merge codes are used to format the secondary file, specify where fields will be inserted into a primary file, when to print a merged file ...

There are around fourteen merge codes but we will only be concerned with three of them. The codes we will be using are:

^R End field. Used in the secondary file to denote the end of a field. See Figure 18 for several examples.

²⁵A hard page is denoted by a line of equal (=) signs across the screen. There are three hard pages in Figure 18.

- ^E End Record. Used in the secondary file to denote the end of a record. This code is usually inserted after the ^E to make the secondary file more readable. See Figure 18 for several examples of this code.
- ^Fn^ Insert Field n. n denotes a field number as mentioned in the definition for field. Placing ^F1^ in a primary file tells WordPerfect to use the first field of each record at this point in the document. In Figure 24, assuming we are using the secondary file contained in Figure 18, ^F2^ will be replaced by a full name, ^F3^ a street address, ^F4^ a City (state and zip) line and ^F1^ a first name.

NOTE that none of the above codes are typed literally. You DO NOT type a caret (^) followed by an R to get ^R. Though you will get something that looks like a ^R on the screen. WordPerfect will NOT interpret it as a merge code. There are at least two ways to type each of the above codes. The easiest way is as follows:

- ^R Hold down the control key and press R. That is Ctrl-R.
- ^E Hold down the control key and press E. That is Ctrl-E.
- ^F1^ Hold down the control key and press F. Follow it by typing 1 and then, in this case only, type the caret (^). That is Ctrl-F1^.

In WordPerfect there is no way to associate a primary file and a secondary file. It is the responsibility of the user to guarantee that they use the proper secondary file for a primary file. This is important because use of ^F1^ refers to the first field in a record, regardless of the content of the record.

For example, consider Figure 20. Field 1 refers to some dollar amount, field 2 is a number of years, field 3 is a date and the final field is a percentage. If this secondary file is used with the primary file contained in Figure 24, instead the ^F2^, ^F3^, ^F4^ combination making a full name and address you would get Years, dates and percentages. The merge command would not complain since both secondary files contain the same number of records. So keep in mind what secondary file goes with a given primary file.

A few additional notes. If two secondary files contain the same type of information, in the same order, it IS alright to use alternate secondary files on a given primary file.

It is also not necessary that all fields in a secondary file be used. You may have one secondary file with 12 fields per record and only use the first three and last two fields. You could use the other fields in that secondary file for another primary file. In other words the feature is fairly flexible and it is up to you to use it correctly and to determine ways to get it to do what you want it to do.

\$300^R
2 years^R
12/09/89^R
50%^E
=====
\$1200^R
7.2 years^R
12/01/88^R
42%^E
=====
\$900^R
1.3 years^R
1/10/90^R
67%^E

Figure 20
Secondary
File #2

Steps to Merging

We are finally ready to discuss the general steps necessary to perform a merge. After this section there will be a tutorial which takes you through creating the secondary file contained in Figure 18, the primary file contained in Figure 24 and finally creating the final product with the merge command.

Merging involves three steps:

- a. Creating the secondary file.
- b. Creating the primary file.
- c. Issuing the merge command.

Creating the secondary files involves typing records of information in the format as shown in both Figure 18 and Figure 20. When creating records you should do the following:

- a. Make sure to end each field with a ^R. (Ctrl-R)
- b. Make sure to end each record with a ^E. (Ctrl-E)
- c. Put a hard page (Ctrl-<Enter>) after each record (directly after the ^E).

Though not apparent from either Figure 18 or Figure 20, a field can be as long or short as necessary. Fields can span several pages if necessary. The usual use involves single words or lines of text, but you can have multiple lines of text in a field. To do so, type the information as you normally would and place a ^R at the end of the text.

One final note about secondary files, if you want access to a specific piece of information you MUST enter that information as its own field. For example, in Figure 24 we needed the first name of the individual so not only do we have the full name as a field, we have just the first name as a field. In this case we could have stored the first and last names separately, but for now we have accomplished what we needed to.

Before creating the primary file it is generally a good idea to create the secondary file. In doing so you know the order of the fields in the secondary file. When creating a primary file you need to be concerned with the potential problem of formatting being messed up by a merge.

Notice in Figure 21 the ^F1^, ^F2^ or ^F3^ could be too long and word wrap. Things like this are common and must be addressed.

Another common problem occurs when merging fields which are several lines long. Long fields may cause a document to extend into another page. Things are hard to see ahead of time, but avoiding these problems will come with practice.

One way to avoid the problem in Figure 21 is to use Flush-Right instead of tabs. Doing so allows a field to extend all the way back to the left margin. If this kind of formatting is allowable for the given situation then the problem is solved.

After the secondary and primary files have been created, all that is left is to issue the merge command. To issue the command you need three things:

- a. A clean screen.
- b. The name of the primary file.
- c. The name of the secondary file.

The rest is easy. Creating the secondary and primary files is the difficult part.

Conclusions

This chapter covers two of the advanced features of WordPerfect. Though these features are advanced in nature, they are very useful in everyday situations. Mastery of them is not expected from these examples, but with practice and effort, these features will become effective word processing tools which can be used on a daily basis.

The outline feature of WordPerfect is a handy way to organize thoughts. It is flexible in the way different levels can be labeled and allows up to 8 unique levels. Paragraph numbers are automatically renumbered when things are moved around, added or deleted.

The outline feature is also useful for writing instructions in a tutorial. Since the outline feature is used for all tutorials in this manuscript, steps can be added, removed, or moved without a need to renumber the steps. Reference to steps within the outline thorough WordPerfect's auto reference feature, to specific steps, can also be made. If the step number changes, so will the reference.

We have covered the basic uses of outlines but have failed to mention that outlines can be used just about anywhere in a document; in footnotes, columns and so on. Outlines are flexible and useful, and it is to your advantage to use them whenever enumeration of steps or similar needs arise.

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This primary file represents a place where a field which is too long could mess up the formatting. Notice that each of the field reference merge codes above COULD potentially word wrap. If this occurs, the formatting of the merge file could be messed up. These kinds of situations may be common. It depends on the type of formatting used, but you must always be looking out for them.

^F1^
^F2^
^F3^

Figure 21 Potential Merge Problem

The merge feature is another extremely useful feature of WordPerfect, and again this manual only skimmed its usefulness. Multi-layered merges, merges with macros, form merging, etc. can be performed. The merge feature used in conjunction with the Advance feature²⁶, makes pre-printed forms, or forms generated in WordPerfect, easy to use or create.

Once the structure of the secondary file has been determined, it is an easy task to make a primary file and merge the document. There are some possible problems with formatting but with practice these too disappear. A secondary file can contain more information than is actually used in any one merge. One secondary file can be used by several primary files, or vice-versa.

The remainder of this chapter contains several tutorials using the outline and merge features in fairly complete examples. Enjoy!

²⁶Which allows you to position text at absolute positions on the page.

TUTORIAL SECTION -- Advanced WordPerfect Features

The first tutorial will take you through creation of the outline contained in Figure 16, Figure 22.

TUTORIAL -- Creating an Outline.

As always, make sure to PAY ATTENTION to the screen and not blindly type this tutorial. Also remember to retain the printout from this tutorial as you will be required to hand it in.

The outline contained in Figure 16, Figure 22 will be created for this first tutorial. Looking at Figure 16, Figure 22 we notice two things. First, the first paragraph is numbered 1 and second, the numbering style is Outline numbering.

- I. Outlining
 - A. What is an outline?
 - B. General steps necessary to create one.
 - C. Simple example of creating one.
 - D. Defining an outline.
 - 1. Starting paragraph number.
 - 2. Different numbering styles.
 - E. How <Tab> and <Indent> work.
 - F. Changing the level of an outline.
 - G. Adding/Deleting entries in an outline.
 - H. Changing the type of outline.
- II. Merging
 - A. What is merging?
 - B. Define secondary files and primary files.
 - C. Simple example.
 - D. Basic Merge Codes.
 - 1. ^Fn^
 - 2. ^R
 - 3. ^E
 - E. Steps for creating a merge.
 - F. Another example.

Figure 22 Initial outline for this chapter.

1. Get into WordPerfect. (Notice that this and all other tutorials were created with the outline feature of WordPerfect!)

- Define the outline. Type:

Shift-<F5>D

Shift-<F5> is the outline key. Your options from this menu are:
Date Text, Date Code, Date Format, Outline, Para Num, Define

The D stands for Define. Notice that a screen similar to Figure 17 is now displayed on the computer screen. (If it is not, press <F1> (cancel) several times until you are back at the editing screen and redo this step.)

By default the starting paragraph number IS 1 and the numbering style is Outline. Even though we did not change anything on this screen, as previously mentioned, this step is necessary. It places a code in the document which MUST be there before this feature will work. The specific code placed in the document is [Par Num Def].

- Since we have finished using this screen, press the following to go back to the first menu of options:

Ø (That's a zero and not the letter O.)

Entering Ø at a menu generally moves you back to the previous menu. If you are at the first menu Ø will take you back to the editing screen.

Before doing the next step, make sure you are at the Date/Outline menu as mentioned in step 2. If you are at the editing screen press Shift-<F5>. If you are at the Outline Define Screen press Ø (zero not the letter O).

- Turn on the outline feature. (Step 2 just defined HOW the outline will look; it did NOT turn on the feature.) To turn on the outline feature type:

OO (That's two letter O's and NOT a zero.)

Two things should have just happened. First, the editing screen is redisplayed. Second, the word Outline is displayed in the lower left corner of the screen. If this is not the case, get help from the lab monitor.

As a quick review, <Enter> creates a new paragraph number, <Tab> moves the cursor in one level and <Indent> fixes the current level. We are going to type each line of the outline in the following manner:

- Press <Enter> to get a number. Press <Tab> once for level 2, twice for level 3 ... (we do NOT use <Tab> for level 1 entries.)

- b. Press <Indent> to fix the level.
 - c. Type the text of the paragraph.
5. Press <enter>.

The roman numeral for I followed by a period, that is I., should have just been created. If not, make sure the outline feature is ON.
6. Press <Indent> (<F4>)

The cursor moved into the next tab stop and the I. stayed put.
7. Type the following:

Outlining<Enter>

Outlining is the text of the paragraph. <Enter> marks the end of the paragraph and creates a new paragraph number.

Since the next three lines of the outline are each level two entries, we will be using both <Tab> and <Indent>.

8. Type the following:
<Tab><F4>What is an outline?<enter>

We had already hit the <Enter> key in step 7 and as such we already had a paragraph number. Hitting <Tab> did two things. First, the II. moved in one level. Second, the II. changed to an A.

Hitting <F4> fixed the paragraph number at A. and moved the cursor to the next tab stop.

The rest is old hat. The text of the paragraph is typed, followed by <Enter>. We are ready to type the next line. Notice that hitting <Enter> caused the cursor to stay at the same level it was at. Until we want to change the level of an outline, we do not have to use the <Tab> key.

9. Type the following:
<F4>General steps necessary to create one.<enter>

We hit the <Enter> key in step 8 so we already had a paragraph number. Hitting <Tab> did two things. First, the II. moved in one level. Second, the II. changed to an B. Hitting <F4> fixed the paragraph number at B. and moved the cursor to the next tab stop.

10. Finish the next two lines. Type the following:

<F4>Simple example of creating one.<Enter>
<F4>Defining an outline.<Enter>

The next two lines are in one additional level (at level 3) so the procedure we used above needs to be modified. We need to use <Tab> to change the level for the first line at level 3.

11. Type the following:

<Tab><F4>Starting paragraph number.<Enter>

We hit <Enter> in step 10 and so we already had a paragraph number. Hitting <Tab> changed the E. to a 1. Hitting the <Tab> also moved the paragraph number in one level each time it was hit.

<F4> fixed the paragraph number at 1. and moved the cursor to the next tab stop.

The rest is old hat. The text of the paragraph is type, followed by <Enter>. We are ready to type the next line.

12. Type the following:

<F4>Different numbering styles.<Enter>

We hit <Enter> in step 11 and so we already had a paragraph number at level 2. Hitting <Tab> changed the E. to a 2. Hitting the <Tab> also moved the paragraph number in one level each time it was hit.

<F4> fixed the paragraph number at 2. and moved the cursor to the next tab stop.

The rest is old hat. The text of the paragraph is type, followed by <Enter>. We are ready to type the next line.

Next we want to type a paragraph line at level 2. To do this we need to move back one level (since we are currently at level 3).

13. Type the following: (Look at Figure 16, Figure 22 before typing this line. Note specifically that you only press tab and indent at the BEGINNING of the line.)

Shift-<Tab><F4>How <Tab> and <Indent> work.<Enter>

Notice, Shift-<Tab> moved back one level. We were at level 3. Now we are at level 2, and will continue to be at level 2 until we use either <Tab> to move in a level, or Shift-<Tab> to move back a level.

14. Finish off the first half of the outline. Type the following:

```
<F4>Changing the level of an outline.<Enter>
<F4>Adding/Deleting entries in an outline.<Enter>
<F4>Changing the type of outline.<Enter>
```

We are now ready to enter a level 1 paragraph again. We are currently at level 1, so we need to move back one level.

15. Type the following:

```
Shift-<Tab><F4>Merging<Enter>
```

PAY ATTENTION to the notes following step 16!

16. To enter the first level 2 entry under II., type the following:
<Tab><F4>What is merging?<Enter>

Notice again that hitting <Tab> moved the cursor in one tab stop AND changed the level. Also notice that instead of I. we got A.! That is, every time we add a new level 1 entry, all lower levels are reset back to 1 (or a, I ...).

Outlines number themselves how you intuitively figure they should. Each time a new level 1 entry is made, all level 2, level 3 ... entries are reset back to 1. Each time a new level 2 entry is made, all level 3, level 4 ... entries are reset back to 1. This renumbering occurs at every level down to the lowest level.

17. To finish the outline, type the following (noting new here):

```
<F4>Define secondary files and primary files.<Enter>
<F4>Simple example.<Enter>
<F4>Basic Merge Codes.<Enter>
<Tab><F4>^Fn^<Enter>
<F4>^R<Enter>
<F4>^E<Enter>
Shift-<Tab><F4>Steps for creating a merge.<Enter>
<F4>Another example.<Enter>
```

After hitting the final <Enter> we have an extra paragraph number. Get rid of it by hitting the <Backspace> key.

18. Turn off the Outline mode by typing the following:

Shift-<F5>Of

Shift-<F5> is the Date/Outline key and O is the Outline option again and f turns the outline off.

19. Print the outline with the following command:

Shift-<F7>F

Shift-<F7> is the <Print> key and F stands for Full document.

20. Save your document under the name outline1. To do this type the following:

<F10>outline1<Enter>

<F10> is the <Save> key. Outline1 is the file name and <Enter> signals the end of the filename.

At this point you can quit from WordPerfect or you can stay in the program in anticipation of doing the next tutorial which is coming up sooner than you think.

The Next Tutorial

In this tutorial we will edit the outline created in the first tutorial of this chapter. We will add two more sections to the outline, modify, delete and add lines to one of the four sections and print out the new outline.

1. Get into WordPerfect.

Make sure your screen is clear BEFORE doing the next step. If it is not either save the file or hit **<F7>NN** to clear the screen without saving what's there.

2. Retrieve the file created in the last tutorial. To do so, type the following:

Shift-<F10>
outline1<Enter>

If WordPerfect could not find the file, check the disk with List Files **<F5>** and see if you can figure what you called the file. (If you didn't call it outline1, you may have just called it outline or possibly outline1 (the letter L)).

- | | | |
|------|--------------------|---|
| I. | Outlining | A. What is an outline?
B. General steps necessary to create one.
C. Simple example of creating one.
D. Defining an outline.
1. Starting paragraph number.
2. Different numbering styles.
E. How <Tab> and <Indent> work.
F. Changing the level of an outline.
G. Adding/Deleting entries in an outline.
H. Changing the type of outline. |
| II. | Table of Contents | A. What information should be included?
B. What are the basic steps?
1. Define the TOC.
2. Mark the text.
3. Generate it.
C. Defining the TOC.
1. Different Number of levels.
2. Numbering styles.
D. Marking the text.
1. Blocking it.
2. Determining the level.
E. Generating the TOC.
F. Brief example.
G. Closing notes on Generation. |
| III. | Merging | A. What is merging?
B. Define secondary files and primary files.
C. Simple example.
D. Basic Merge Codes.
1. ^Fn^
2. ^R
3. ^E
E. Steps for creating a merge.
F. Another example. |
| IV. | Graphics Inclusion | A. What are graphics?
B. Where do you get them?
C. Creating a Figure.
1. Caption.
2. Size.
3. Page Location.
4. Editing it.
D. Wrapping text around it. |

Figure 23 Extended Outline

We will start by adding the part of the new outline which covers creating a table of contents. If the cursor is at the beginning of the document, the word "Outline" will not appear at the bottom of the screen. However, once you move within the outline, "Outline" will be displayed. WordPerfect knows where the beginning and ending of the outline is, so when you are within an outline, you will be in "Outline" mode.

3. Move the cursor to the end of letter H. under roman numeral I. (The end of the line "Changing the type of the outline.")
4. With outlining on and the cursor properly placed, hit the <Enter> key. This will give you a "L".
5. Since this is a level 1 entry, we need to fix the level and type the line. To do so, type the following:

Shift-<Tab><F4>Table of Contents.<Enter>

Remember that Shift-<Tab> moves back one level while <F4> fixes the level. <Enter> ends the paragraph and gives us a new paragraph number at level 1.

6. Type the following remembering that we are adding to an already existing outline.

```
<Tab><F4>What information should be included?<Enter>
<F4>What are the basic steps?<Enter>
<Tab><F4> Define the TOC.<Enter>
<F4> Mark the text.<Enter>
<F4> Generate it.<Enter>
Shift-<Tab><F4>Defining the TOC.<Enter>
<Tab><F4> Different Number of levels.<Enter>
<F4> Numbering styles.<Enter>
Shift-<Tab><F4>Marking the text.<Enter>
<Tab><F4> Blocking it.<Enter>
<F4> Determining the level.<Enter>
<F4>Is it level 1, level 2...<Enter>
Shift-<Tab><F4>Generating the TOC.<Enter>
<F4>Brief example.<Enter>
<F4>Closing notes on Generation.<Enter>
<F4>Summary.
```

Notice that you should NOT type <Enter> after the last line. Remember why? We will now add the last section, namely Graphics Inclusion.

7. Move the cursor to the end of the last line of the outline. (At the end of the line "Another example.")
8. Press <Enter> to get another paragraph number.

9. Type the following:

```
Shift-<Tab><F4>Graphics Inclusion<Enter>
<Tab><F4>What are graphics?<Enter>
<F4>Where do you get them?<Enter>
<F4>Creating a Figure.<Enter>
<Tab><F4>Caption.<Enter>
<F4>Size.<Enter>
<F4>Page Location.<Enter>
<F4>Editing it.<Enter>
Shift-<Tab><F4>Wrapping text around it.
```

Next we'll practice deleting paragraphs we don't want. If you haven't already noticed, two additional paragraphs were included in step 6. We are now going to delete them.

10. Move the cursor to the line "Is it level 1, level 2...".

11. Position the cursor at the beginning of the line by typing:

```
<Home><Home><Left Arrow>
```

12. Turn on block with Alt-<F4>.

13. Move the cursor down one line. (This paragraph is only one line long.)

14. Hit <Delete> to delete the paragraph and type Y to confirm the deletion.

15. Move the cursor to the last line of section roman numeral II. section (the line "Summary.").

16. Position the cursor at the beginning of the line by typing:

```
<Home><Home><Left Arrow>
```

17. Turn on block with Alt-<F4>.

18. Move the cursor down one line. (This paragraph is only one line long.)

19. Hit <Delete> to delete the paragraph and type Y to confirm the deletion.

20. Print this outline with the following command:

```
Shift-<F7>F
```

Which is the usual print command.

21. Save this document with the following steps.
 - a. Hit <F10> which is the <Save> key. Notice that the name of the file, outline1, will already be displayed at the bottom of the screen.
 - b. Press <Enter> to accept the (default) name of outline1. WordPerfect will let you know that this file already exists and ask if you wish to overwrite the file.
 - c. Since you have made several changes to the file you DO want to save the new file. To do so press Y to confirm the replace.

At this point you can quit from WordPerfect or you can stay in the program in anticipation of doing the next tutorial which is coming up sooner than you think.

The Final Tutorial on Outlines

This tutorial will make additional changes to the file outline1 which was created in the first tutorial of this chapter and edited in the second tutorial. We will rearrange the order of a few sections and change the paragraph type.

1. Get into WordPerfect.

Make sure your screen is clear BEFORE doing the next step. If it is not either save the file or hit **<F7>NN** to clear the screen without saving what's there.

2. Retrieve the file modified in the last tutorial. To do so type the following:

Shift-<F10>outline1<Enter>

If WordPerfect could not find the file, check the disk with List Files **<F5>** and see if you can figure what you called the file. (If you didn't call it outline1 you may have just called it outline or possibly outline1 (the letter L)).

We will start by moving some sections. The first move involves moving section roman numeral II to section roman numeral III.

3. Move the cursor to the beginning of section roman numeral II. (The line "Table of Contents".) Make sure you are at the beginning of the line by typing **<Home><Home><Left Arrow>**.
4. Turn on block with **Alt-<F4>**.
5. Move the cursor to beginning of the line after the last line of this section. (That's line "III. Merging".) If everything is correct you need only hit the **<Down Arrow>** key 16 times.
6. Next use the block move command. Type:

Ctrl-<F4>BM

That's **<Move>** Block Move.

You must now position the cursor where you want to move the section to.

7. Move the cursor to the beginning of the line "III. Graphics Inclusion" and press **<Enter>**. (Note that the IV. has changed to III.)
8. Save this document with the following steps.

- a. Hit <F10> which is the <Save> key. Notice that the name of the file, outline1, will already be displayed at the bottom of the screen.
- b. Press <Enter> to accept the (default) name of outline1. WordPerfect will let you know that this file already exists and ask if you wish to overwrite the file.
- c. Since you have made several changes to the file you DO want to save the new file. To do so press Y to confirm the replace.

Next we'll move just one line.

9. Move the cursor to the second line of the outline (the line "What is an outline?"). Position the cursor at the beginning of the line.
10. Turn on block.
11. Move the cursor to the beginning of the line following the end of this paragraph. (Note that since this paragraph is only one line long, you'll just move the cursor to the beginning of the next line.)
12. Press <Move> Block Move

Ctrl-<F4>BM

13. Move the cursor to the beginning of the line "What information should be included?" and press <Enter>.

Notice how the outline renumbered itself. Of course this line does not make any sense here so we'll move it back.

14. Position the cursor at the beginning of the line "What is an outline?".
15. Turn on block with Alt-<F4>.
16. Move the cursor to the beginning of the next line (the line "What information should be included?").
17. Press <Move> Block Move

Ctrl-<F4>BM

18. Move the cursor to the beginning of the line "General steps necessary to create one." and press <Enter>.

Notice again the renumbering of the paragraphs. Hopefully your outline is in the correct order. You should have the sections in the following order: Outlining, Merging, Table of Contents and finally Graphics Inclusion.

19. Print this document with Shift-<F7>F.

Finally we will change the numbering style from Outline to paragraph and finally to legal numbering.

20. Using Reveal Codes, position the cursor just after the [Par Num Def] code. The code should be somewhere at the top of your document. (Actually it should be the first thing in your document.)

We are going to change from Outline to Paragraph style. The Roman Numerals will change to regular numbers. The capital letters will change to lower case ...

21. Type:

Shift-<F5>D

Shift-<F5> is the Date/Outline key. D stands for Define style. The screen should resemble Figure 17.

Pay attention to the Current Definition line in the middle of the screen as it will change after the next step.

22. Press P for paragraph numbering. Notice that the Current Definition changed. If it did not change, try hitting the P key again.
23. Hit <F7> twice to get back to the editing screen. You should notice a change in your outline. If you didn't, the cursor probably was not located after the [Par Num Def]. Turn on Reveal Codes and see if the cursor is on top of a [Par Num Def] code. If it is then you did NOT have the cursor AFTER the original [Par Num Def]. To fix this error, just hit <Backspace>, move the cursor after the [Par Num Def] and go back to step 21.
24. If Reveal-Codes is not on, turn it on. You should see the following;

[Par Num Def][Par Num Def][Outline On]

Put the cursor on the FIRST [Par Num Def] and hit the <Delete> key to remove the extraneous definition.

25. Print this copy of the document with Shift-<F7>F.
26. Using Reveal Codes, position the cursor just after the [Par Num Def] code. The code should be somewhere at the top of your document. (Actually it should be the first thing in your document.)

We are going to change from Paragraph to Legal style. The first level of numbers will remain the same. All other levels will become numbers also.

27. Type:

Shift-<F5>D

Shift-<F5> is the Date/Outline key. D stands for Define style. The screen should resemble Figure 17 (page 73).

28. Press L for legal numbering. Notice that the Current Definition changed. If it did not change, try hitting the L key again.
29. Hit <F7> twice to get back to the editing screen. You should notice a change in your outline. If you didn't, the cursor probably was not located after the [Par Num Def]. Turn on Reveal Codes and see if the cursor is on top of a [Par Num Def] code. If it is then you did NOT have the cursor AFTER the original [Par Num Def]. To fix this error, just hit <Backspace>, move the cursor after the [Par Num Def] and go back to step 27.
30. If Reveal-Codes is not on, turn it on. You should see the following:
[Par Num Def][Par Num Def][Outline On]

Put the cursor on the FIRST [Par Num Def] and hit the <Delete> key to remove the extraneous definition.
31. Print this copy of the document with Shift-<F7>F and exit from WordPerfect.

This is the end of the tutorial. After completing all of its parts you should have obtained a total of 5 printouts. Total points for the three outline tutorials: 30

TUTORIAL -- First Merge

This tutorial will take you through creation of the secondary file contained in Figure 18, creation of the primary file contained in Figure 24 and creating a merged file. Make sure to keep all printouts done in this and the following tutorials since you will need to turn them in. Also, be sure to read each step completely before performing it. There are some clarifying notes explaining what you are to type.

Fred's Magazine
4551 Business Lane
Cedar Rapids, Iowa 52406

January 6, 1990

^F2^
^F3^
^F4^

Dear ^F1^,

We here at Fred's Magazine are proud to offer you substantial savings over other magazine outlets.

You may think this is just another form letter, A.K.A junk mail, but you will be surprised to find that we hand pick, process and mail our yearly flyer only to very special and valued customers such as yourself.

If you would just spend some time going over our catalog I am sure you will find something to fit even the most discriminating tastes. We at Fred's Magazine are quite proud of our selection.

If you can't find a specific magazine, contact us and we will gladly try to special order it for you.

We hope to hear from you soon.

Sincerely,

Fred Dugumpum, President

Enclosure

Figure 24 First Merge Letter

1. Get into WordPerfect.
2. We will first create the secondary file. Enter the first field of the first record. Type the following:

Larry^R<Enter>

^AR here means to type Ctrl-R. Typing in a secondary file involves only two new concepts. First, making sure to hit ^AR (Ctrl-R) at the end of each field and second, to type ^AE (Ctrl-E) [HPg] at the end of each record.

Since this line is typed at the beginning of the document, it is the first field of the first record. ^R signifies the end of the first field; the next line will be the second field of the first record.

3. Enter the second field of the first record. Type:

Larry Targeniz^R<Enter>

Here again remember to use Ctrl-R for ^R. Since this line comes directly after the first line of the record AND because there is an end field code (^R) at the end of the first line of the record, this line becomes the second field of the record.

4. Enter the third field of the first record. Type:

2212 12th Street^R<Enter>

5. Enter the last (fourth) field of the first record. Type:

Downers Grove, IL 55332^E[HPg]

^AE here means to type Ctrl-E. [HPg] here means to type Ctrl-<Enter> and stands for hard page. When you type the [HPg] you will see a line of equal (=) signs across the screen.

Since this is the last field of the record, we use ^AE instead of ^R to signify end of record. The [HPg] is NOT strictly necessary but it makes reading the secondary file easier.

We are now ready to type in the next record. Since we just typed ^AE[HPg], the next line of text in this file is the first field of the next (second) record.

6. Type in the first field of the second record. Type:

Shawn^R<Enter>

^AR here means to type Ctrl-R. Since this line is typed just after an end record merge code (^E), this line is the first field of the second record. ^R signifies the end of the first field meaning the next line will be the second field of the (second) record.

- Type in the second field of the second record. Type:

Mary^R<Enter>

Remember ^R means Ctrl-R.

- Type in the third field of the second record. Type:

30 S. Johnson, Apt 4^R<Enter>

- Type in the last field of the second record. Type:

Iowa City, IA 52240^E[HPg]

^AE here means to type Ctrl-E. [HPg] here means to type Ctrl-<Enter> and stands for hard page. When you type the [HPg] you will see a line of equal (=) signs across the screen.

Since this is the last field of the record, we use ^AE instead of ^AR to signify end of record. The [HPg] is NOT strictly necessary but it makes reading the secondary file easier.

We are now ready to type in the next record. Since we just typed ^AE[HPg], the next line of text in this file is the first field of the next (second) record.

The next two records are entered in a similar manner. You will be given just what you need to type without the description.

- Finish off the secondary file. Type:

Mary^R<Enter>
Mary Farlthon^R<Enter>
Main Street^R<Enter>
Chicago, IL 66402^E[HPg]
Charles^R<Enter>
Charles Bargdon^R<Enter>
1200 W. Benton^R<Enter>
Iowa City, IA 52240^E

Notice that we did not use [HPg] after the last record. The decision not to place a hard page at the end of a secondary file is completely arbitrary.

We need to print this file and save it for later use. We are also going to need a clear screen since we will be creating a primary file. We will first print the file and then use the <Exit> (<F7>) key to save this document.

11. Print the file. Type:

Shift-<F7>F

Which means <Print> Full document. We had four records in the secondary file and placed [HPg] between each of the record. We will therefore have a four page printout.

12. Save the document under the name shortmrg and clear the screen. Type the following:

<F7>Y	(<Exit> command, Yes I want to save the document)
shortmrg<Enter>	Save the file under the name shortmrg.
n	No I do NOT want to quit from WordPerfect.

We have printed the secondary file, saved it and cleared the screen. We are now ready to create the primary file. Creation of the primary file is fairly straightforward. I will take you through the first few lines which includes typing merge codes. You will need to type the remainder of the file.

13. Enter the first three lines. Type each of the following lines with seven tabs before it. (If 7 tabs causes word wrapping, use 6.)

Fred's Magazine<Enter>
4551 Business Lane<Enter>
Cedar Rapids, Iowa 52406<Enter><Enter><Enter>

14. Next enter the date line. Type:

January 6, 1990<Enter><Enter>

We are ready to insert the first field inclusion merge codes. To type a code we will type a Ctrl-F (^F) followed by the field number and a caret (^). As a quick review, field 1 is the first name, field 2 the full name and fields 3 and 4 make up the address.

15. Enter the first field inclusion merge code. Type:

^F2^<Enter>

Remember that means Ctrl-F followed by the number 2 and finally type the caret (^) character. Field 2 is the full name field.

16. Enter the second field inclusion merge code. Type:

^F3^<Enter>

Remember that means Ctrl-F followed by the number 3 and finally type the caret (^) character. Field 3 is the street address field.

17. Enter the third field inclusion merge code. Type:

^F4^<Enter><Enter>

Remember that means Ctrl-F followed by the number 4 and finally type the caret (^) character. Field 4 is the city (state, zip) line.

We need to insert the final merge code. Notice that there is text before and after the final merge code. WordPerfect will automatically reformat the code after the merge is completed so a merge code can be placed anywhere in a document. Here again, caution should be used as merging may cause a document's format to be incorrect.

18. Type the following:

Dear ^F1^<Enter><Enter>

Remember ^F1^ means to type Ctrl-F followed by a 1 and finally a caret (^).

19. Type the remainder of the document. (See Figure 24.)

We will now print the document, save it and clear the screen. After the screen is clear we will perform the merge. The name of this file should be firsmerg.let.

20. Print the document with the following command:

Shift-<F7>F

21. Save the document. Use the <Exit> command to clear the screen at the same time. Type the following:

<F7>Y	(<Exit>, Yes I want to save document.)
firsmerg.let<Enter>	(Save with the filename firsmerg.let.)
N	(No I do not want to quit.)

Now we will merge the two files. To do this we need three things:

- The name of the secondary file.
- The name of the primary file.
- A clear screen.

22. Perform the merge. Type the following:

```
Ctrl-<F9>M  
firmsmerg.let<Enter>  
shortmrg<Enter>
```

Ctrl-<F9> is the Merge/Sort command. Your options after hitting Ctrl-<F9> are Merge or Sort. We hit M which selected merge.

WordPerfect prompts you for the name of the primary file. You respond by typing firmsmerg.let and pressing <Enter>.

WordPerfect next prompts you for the name of the secondary file. You respond by typing shortmrg and pressing <Enter>.

WordPerfect reads both files from disk and creates a new file in the memory of the computer. The result is four copies of the primary file with different names and addresses.

We need to print this file out, but do we need to save it? We still have the secondary and primary files so is it necessary to save the merged file? It might be but that depends on the situation. We are not going to save this file.

23. Print the file with the following command:

```
Shift-<F7>F
```

24. Quit out of WordPerfect.

Total points for tutorial: 20

Merge Tutorial #2

A Big U.S. Educational Library
Right in the Middle of
Podunk, IA 65432-0987

June 15, 1992

^F1^ ^F2^

Dear ^F1^,

As you probably realize, you have an
overdue book. The title of the book
is " ^F4^".

If you do not return this book by ^F5^
you will have to pay the replacement
cost of the book. As it is you owe
\$^F3^ already. Please do not force us
to use legal action.

Share the adventure, return your
library books.

Sincerely,

David Robert Jones
Library Coordinator

P.S. If you find this letter in
error, please contact me at the above
address.

Figure 25 Final Primary File

Larry^R
Targina
1234 South Ground
P.O. Box 1145
Ultima, KA 55412^R
12.23^R
Godel, Escher, Bach: An Eternal
Golden Braid^R
3/15/90^E

—

Charles^R
Lawson
4412 Pony Drive
Scotts Valley, CA 95066^R
15.95^R
Classics of Western Philosophy^R
3/7/90^E

—

Robert^R
Charles
RR 14, Box 991
Coralville, IA 52442^R
10.00^R
Principles of Database and Knowledge-
Base Systems^R
4/1/90^E

—

Kevin^R
Rosemund
1816 Lower Muscatine Road
Iowa City, IA 52240^R
9.00^R
Artificial Intelligence, A Knowledge-
Based Approach^R
3/21/90^E

Figure 26 A Third Secondary File

This tutorial will extend the idea of just what a field can contain and where field reference merge codes can be placed within a primary file. Figure 25 and Figure 26 contain the information for the final tutorial of this chapter. Before beginning the tutorial let's discuss the structure of the secondary file.

The secondary file contains 4 records. Each record contains 5 fields. In the figure it appears as if some of the lines word wrap but when you create the primary file there will probably be no word wrapping.

The first field is the same as in the first tutorial, just the first name of the person. This secondary file is very different from the first secondary file. It contains the last name and the full address of the person. For our purposes this is fine but this kind of record structuring will not always work. One other point about the second field, it contains multiple lines. The third

field represents a dollar amount when merged with the primary file. The fourth field is a book title and the fifth field represents the book due date.

1. Get into WordPerfect.

First step, as usual, will be to create the secondary file first. Remember that ^R means Ctrl-R, ^E means Ctrl-E, [HPg] means Ctrl-<Enter>, ^F1^ means Ctrl-F 1 ^, ^F2^ means Ctrl-F 2 ^ ...

2. Type the following:

```
Larry^R<Enter>
Targina<Enter>
1234 South Ground<Enter>
P.O. Box 1145<Enter>
Ultima, KA 55412^R<Enter>
12.23^R<Enter>
Godel, Escher, Bach: An Eternal Golden Braid^R<Enter>
3/15/90^E[HPg]
```

Notice that <Enter> was used several times before the second ^R. This field will take up four lines when merged as a result.

3. Type the following:

```
Charles^R<Enter>
Lawson<Enter>
4412 Pony Drive<Enter>
Scotts Valley, CA 95066^R<Enter>
15.95^R<Enter>
Classics of Western Philosophy^R<Enter>
3/7/90^E[HPg]
```

The second field in this record is one line shorter than the second field in the previous record. Is this alright? Yes because the structure of a field is not what is important. You should have the same number of fields per record, the number of lines in a field has no bearing on the correctness of the record.

4. Type in the third record:

```
Robert^R<Enter>
Charles<Enter>
RR 14, Box 991<Enter>
```

Coralville, IA 52241^R<Enter>
10.00^R<Enter>
Principles of Database and Knowledge-Base Systems^R<Enter>
4/1/90^E[HPg]

5. Finish up the secondary file type by typing the following:

Kevin^R<Enter>
Rosemund<Enter>
1816 Lower Muscatine Road<Enter>
Iowa City, IA 52240^R<Enter>
9.00^R<Enter>
Artificial Intelligence, A Knowledge-Based Approach^R<Enter>
3/21/90^E

6. Save this file with the under the name finalmrg.tut. Type:

<F7>Y	(<Exit>, Yes I want to save the file.)
finalmrg.tut<Enter>	(Type the name and hit <Enter>.)
N	(No I do not want to quit.)

Next we will create the primary file. This primary file is a little different in form and usage of field inclusion merge codes.

7. Type in the inside address and date line, type:

Alt-<F6>A Big U.S. Educational Library<Enter>
Alt-<F6>Right in the Middle of<Enter>
Alt-<F6>Podunk, IA 65432-0987<Enter><Enter>
January 9, 1992<Enter><Enter>

Examine the structure of Figure 26 before doing the next step. Notice that the end field merge code comes just after field 1. In other words there is effectively no hard return after the name. ^F1^ ^F2^ in the Figure 25, when typed as shown, make a complete name and address.

8. Type in the first two field inclusion merge codes:

^F1^ ^F2^<Enter><Enter>

9. Type in the next line:

Dear ^F1^,<Enter><Enter>

The first paragraph of this letter contains a field inclusion merge code inside quotation marks. Remember that field 4 is the name of a book. I would have used underline but it would have confused the issue. You can format a field inclusion code and, after merging, the merged field will have the same formatting. We could have used <Bold> or <Underline> instead of quotation marks if we wanted a particular kind of formatting.

10. Type in the first paragraph:

As you probably realize, you have an overdue book. The title of the book is "^AF4^A".<Enter><Enter>

Note that "^AF4^A" means to type a quotation mark ("), Ctrl-F, 4, ^ and finally a closing quotation mark (").

The rest of the field inclusion merge codes are used in a similar manner so I will just cover what you should type to complete this primary letter.

11. Type in the next paragraph:

If you do not return this book by ^AF5^A you will have to pay the replacement cost of the book. As it is you owe \$^AF3^A already.
Please do not force us to use legal action.<Enter><Enter>

12. Type the rest of the letter:

Share the adventure, return your library books.<Enter><Enter>
Sincerely,<Enter><Enter><Enter><Enter>
David Robert Jones<Enter>
Library Coordinator<Enter><Enter>
P.S. if you find this letter in error, please contact me at the above address.<Enter>

Next, as usual, save and print this letter. The filename for this primary file should be finalpri.tut. Also, we will be merging so we will need a clear screen.

13. Print the file:

Shift-<F7>F

14. Save the document:

<F7>Y	(<Exit>, Yes I want to save the document.)
finalpri.tut<Enter>	(Finalpri.tut is the filename.)
N	(No I do not want to quit from WordPerfect.)

The file is saved, the screen is clear and we are ready to perform the merge. To perform a merge we need three things:

- a. The primary file name: Finalpri.tut
- b. The secondary file name: Finalmrg.tut
- c. A clear screen.

Since we have all the necessary components for a merge, let's proceed.

15. Perform the merge. Type the following:

```
Ctrl-<F9>M  
finalpri.tut<Enter>  
finalmrg.tut<Enter>
```

Ctrl-<F9> is the Merge/Sort command. Your options after hitting Ctrl-<F9> are Merge or Sort. We hit M which selected merge.

WordPerfect prompts you for the name of the primary file. You respond by typing finalpri.tut and pressing <Enter>.

WordPerfect next prompts you for the name of the secondary file. You respond by typing finalmrg.tut and pressing <Enter>.

16. Print the results.

Total points for tutorial: 20

WordPerfect reads both files from disk and creates a new file in the memory of the computer. You should see four copies of the primary letter with different names, address, book titles, etc.

Advanced WordPerfect Features Assignments

ASSIGNMENT #1

Create the multiple guess exam contained in Figure 27. You MUST use the outline feature when entering the questions.

NOTES:

The title is centered. Make sure to use underlining where necessary. Your result will NOT look the same as that of Figure 27 since you will be using standard (1") margins.

This figure uses paragraph outlining.

- A. Create the document contained in Figure 27, making sure to use the outline feature.

Make sure to turn off outlining after you create the document.

- B. Print and save the entire document. (5)

- C. Go to the last line of the document and turn on Reveal Codes.

Hit <Print-Screen> with reveal codes on. Note that this will show whether or not the outline feature was used in this assignment. Hand this printout in. (15)

- D. Change the order of the second and third questions. You will want to use the block move command to move these questions around. See page 96 for notes on how to perform this operation.
- E. Print the new form of the document. (5)

MULTIPLE GUESS	
<p>Read each question <u>completely</u> before answering it. Select the <u>best</u> answer from the list given. If you do not know the answer, try to rule out as many options as possible and guess the answer from the remaining options.</p>	
<p>Each question is worth half of your grade.</p>	
1.	What music group released a self-titled album called <u>Tin Machine</u> in 1989? a. R.E.M. b. ICE-T c. Tears For Fears d. Tin Machine
2.	What is the real name of David Bowie? a. David Bowie b. David-Lee Bowie Jones c. David Robert Jones d. M.C. Escher
3.	<u>Whisper to a Scream</u> was written by which of the following groups/Artists? a. Duran Duran b. Icicle Works c. They Might Be Giants d. Aztec Camera
4.	Which of the following songs was written by Depeche Mode? a. Never Let Me Down Again b. Somebody Gotta Do It c. Out of Hand d. Ana Ng

Figure 27 Assignment 1

- F. Change the numbering style from paragraph to outline. See page 98 for notes on how to perform this operation.
- G. Print the new form of the document. (10)

ASSIGNMENT #2

Create an outline of the first two chapters of this book. Use the Table of Contents as your source of information. See Figure 28 for a partial example of what the outline should look like.

Print two forms of this outline. One with outline numbering and another with legal numbering. (20/5)

I.	INTRODUCTION
II.	Meta Characters
A.	PURPOSE
B.	SPECIAL NOTATIONS
1.	Ctrl-
2.	Alt-
3.	()
4.	[]
5.	<>
6.	Shift-
7.	EXAMPLES

Figure 28 Assignment 2

Assignment #3

Figure 29 contains the data for the secondary file. Create this file and give it the name mergassi.1.

- A. Create the secondary file making sure to place a ^R at the end of each field and a ^E [HPg] at the end of each record.

Field 1 is the first name of the manager for a department.

Field 2 is the last name and the remainder of the manager's address.

Field 3 is the name of the manager's department.

Field 4 is the yearly bonus for the manager.

Field 5 is a note which describes why the person received the bonus they did.

Field 6 is a note on the departmental improvement for the year.

Field 7 is a closing note.

- B. Create the primary file contained in Figure 30.

- C. Merge the file (You should get a four page file). Print the entire file. (25)

```
Fred^R
Gearhead
9889 South Bend
Iowa City, IA. 52422^R
Kids Toys^R
500^R
your eye for detail and desire to help customers^R
out performed itself from last year by 42%^R
Keep up the good work^E
-----
Sue^R
Frazlow
P.O. Box 44321
Iowa City, IA. 52244^R
Computers and Electronics^R
650^R
your eye for detail and desire to help customers
as well as your seeming endless pool of excellent
ideas^R
out performed itself from last year by 51%^R
Keep up the excellent work^E
-----
Barney^R
Bumlt
P.O Box 1967
Iowa City, IA. 52244^R
Mens' Clothing^R
100^R
your somewhat disorganized approach to department
management and overall sales^R
out performed itself from last year by 13%^R
Try to organize yourself a little better.^E
-----
Linda^R
Kranfeld
RR 1, Box 31
Iowa City, IA. 52240^R
Lawn and Garden^R
95^R
your somewhat disorganized approach to the
department management and overall sales^R
out performed itself from last year by 14%^R
Try to organize yourself a little better.^E
```

Figure 29 Secondary File for Assignment 3

Wally's We Got It All Store
1800 Three Rights Blvd.
Iowa City, IA. 52241

January 9, 1990

^F1^ ^F2^

Dear ^F1^,

It is once again that time of the year when we hand out managers' bonuses. Your yearly bonus is \$^F4^ and is based on ^F5^.

The ^F3^ department ^F6^.

^F7^.

Sincerely,

Wally Targenza
Owner

Encl

Figure 30 Primary File

Chapter 8 -- Spreadsheet Concepts

A spreadsheet is an application program used to manipulate rows and columns of data. This data generally consists of numbers with some text to describe what the numbers represent. What the numbers represent is entirely left up to the user. Typical examples of what spreadsheets are used for include:

1. Grade sheet. Each row represents information about a particular student. Each column represents one piece of information about that student, i.e. Name, Grade, scores, ...

	Grade	Test 1	Test 2	Test 3
Doe, Jane	A	100	95	99
Franz, Larry	B	87	100	75

2. A bowling card. Each row represents information about a person and their scores. Each column represents one piece of information about a given person, i.e. their name, a game score, or their three game total.

	Game 1	Game 2	Game 3	Totals
Frank	150	175	174	499
Fran	156	205	207	568
Hal	200	201	178	579
Sue	200	198	199	597
Totals	706	779	758	2243

Spreadsheets are generally organized as in the above two examples. Rows represent all information about one particular item. In the above two examples, the "items" are people, but a row could also represent a company, an item available for purchase, or anything else. Columns are generally used to hold one particular piece of information about the items being represented. If a row represents a company, the columns could represent monthly revenue, inventory counts, etc. If a row used to contain items available for purchase, the columns could represent purchase price, retail price, inventory count, part number, etc.

	A	B	C	D	E	F	G	H		
1						Col ↓				
2										
3										
4										
5										
6	Row →			CELL		← ROW				
7										
8										
9										
10						Col ↑				

Figure 31 Spreadsheet

SPREADSHEET CONCEPTS

BORDER(SPREADSHEET BORDER)

The border of a spreadsheet consists of the Row numbers and Column letters. In Figure 31 above, the border is enclosed in a box.

CELL

A cell is a storage location on a spreadsheet. (See Figure 31.) It is also the intersection of a column and a row. In example 2 above, each score is stored in its own cell. A cell is denoted by a letter followed by a number. Examples are: A1, B3, Q45.

COLUMN

A column is a vertical collection of cells. In example 1 above, the first column consists of the student names while the second column consists of letter grades. Columns are denoted by letters. Examples are: A, D, AA.

CONTEXT SENSITIVE HELP

The help feature on SuperCalc is accessed through either ? or <F1>. The help is context sensitive which means it gives help on what feature of SuperCalc is currently being used.

CURRENT CELL

The current cell of a spreadsheet is where the spreadsheet cursor is. It is the cell being worked on.

CURRENT CELL STATUS LINE

The current cell status line is a line on the screen reserved to display information about the current cell. The cell address, contents and cell format are displayed on this line. Note that the contents of the cell and what is displayed on the screen are often quite different.

The current cell status line in SuperCalc is the 4th line up from the bottom of the screen.

CURSOR MOVEMENT

Cursor movement is accomplished by using the arrow keys. Pressing the Up arrow key will make the spreadsheet cursor move up. Pressing the down arrow key will make the spreadsheet cursor move down. The right and left arrow keys move the cursor to the right and left. The spreadsheet cursor cannot be moved above row 1 or before column A.

ENTRY

An entry is a piece of data that has been entered into a cell. A, 100, 95 and 99 are four examples of entries in example 1 above.

ENTRY LINE

The entry line of SuperCalc is where an entry is typed. The entry line is the 2nd line up from the bottom of the screen.

FORMULAS

Formulas are a special form of numerical data that perform mathematical calculations. i.e. 1+5, A1+B6, SUM(<RANGE>) ...

GLOBAL STATUS LINE

The global status line gives information about the width of the current column, the amount of available memory and the Last row and column where information has been entered. It is the 3rd from the bottom of the screen in SuperCalc.

GOTO

The goto command allows the user to directly move to a given cell. In SuperCalc the = (equal) key is used to begin the goto command.

MENU LINE

The menu line is the bottom line of the screen.

NUMERICAL DATA

Numerical or numeric data is a collection of numbers and/or math symbols that may be used in numerical calculations. i.e. a grade, bowling score, dollar amount ...

RANGE

A range of cells is anywhere from 1 to any number of continuous cells. It can be one row or several rows, one column or several columns or a block of cells. To enter a range, the upper left cell address and the lower right cell address are typed, separated by a colon. Examples of ranges are:

A1:D3 All the cells from A1 to D3 are included. This list includes A1, B1, C1, D1, A2, B2, C2, D2, A3, B3, C3 and D3.

A All of column A.

B3 Just a single cell.

When a range should be entered, it will be represented with the following symbol:
`<range>`.

ROW

A row is a horizontal collection of cells. In example 1 above, the first row consists of "Doe, Jane A 100 95 99". Rows are denoted by numbers. Examples are 1, 3, 43.

SLASH (/) COMMANDS(COMMANDS)

Commands are entered into many spreadsheet by preceding them with a slash. In the case of SuperCalc, / at the entry means that the entry being typed is a command. Examples follow:

/Blank Blank parts of the spreadsheet.

/Save Save the spreadsheet.

SPREADSHEET CURSOR

The spreadsheet cursor is a large reverse video bar which points to where information will go when the `<enter>` key is pressed.

TEXTUAL DATA

Textual data is a collection of letters and/or numbers and/or special symbols like %, & or # that will not be involved in numerical calculations. i.e. A name, a zip code, a social security number ...

TEXT WINDOW

Many spreadsheets will be too large to fit on the screen. When this is the case, the screen is called a text window.

A text window displays as much of the spreadsheet as will fit on the screen. If the spreadsheet cursor is moved far enough to the left or down, the screen will scroll to the right or up.

A text window is necessary because the screen is only 80 characters wide by 25 rows high, which can be quite small compared to a large spreadsheet.

Chapter 9 -- Spreadsheet Formulas

A formula gives the spreadsheet its power. A formula can consist of numbers, cell references, mathematical symbols or functions. Numbers are interpreted literally. i.e. 5 has a value of 5.

Cell references are interpreted as the value stored in the cell. For example if the formula A1 + 5 is placed in cell B1, the formula takes the value in cell A1, adds 5 and the result is shown in cell B1. More on this later.

Symbols used in formulas include the following.

\wedge	raised to the power of
()	Parenthesis
*	Multiply
/	Divide
+	Add
-	Subtract
%	Compute a percentage

A SMALL list of SuperCalc's formulas:

sum(<range>)	Find the sum of the cells in <range>.
average(<range>)	Find the average of the cells in <range>.
count(<range>)	Count the number of numerical entries in <range>.
min(<range>)	Find the minimum value in <range>.
max(<range>)	Find the maximum value in <range>.
pmt(<Principal>, <Interest/12>, <Num months>)	Find the payment necessary to take <principal> down to \$0 at a given interest and in <num months> number of months.
anterm(<payment>, <Interest/12>, <Principal>)	This function will compute the number of months (from the /12) necessary to pay off a loan. <Payment> is the size of the payments. <Interest/12> is the interest rate/12. <Principal> is the amount of the loan.

`lookup(<value>,<Row/Col range>)`

<Value> can be a numeric value or any type of formula.
(including a cell reference) Value is compared to either a
row or column of numbers.

Lookup will return the value just to the right of the <column
range> or just below the <row range> that is closest to but
not greater than value. An example follows.

An example for lookup:

The above is part of a bigger spreadsheet. This is a lookup table.
To be totally correct, the values in column B were entered as shown
above. This method of entering text allows things like letters to be
used in lookup tables.

The following examples should clarify how lookup works.

`lookup(.7,A1:A6)`

This lookup will return the value of ("C") since .7
matches exactly the value in cell A3.

`lookup(.85,A1:A6)`

This lookup will return the value of ("B") because .85
is between .80 (cell A4) and .90 (cell A5).

	A	B	Value in B
1	.00	F	("F")
2	.50	D	("D")
3	.70	C	("C")
4	.80	B	("B")
5	.90	A	("A")

Figure 32 Lookup Example

Lookup compares one value to a range of values, finds the closest one that is less than the value being compared with and returns the value in the next column over or the next row down, depending on how the lookup table is arranged. Note that the lookup table values MUST be in ascending order.

A formula can consist of any combination of the above but must be less than 240 characters long. The result of the formula will be displayed on the screen but the actual formula itself is stored in the cell in which it was entered. An example follows:

	A	B	C	D	E
1	Name	Game 1	Game 2	Game 3	Totals
2	Brett	156	198	176	530->sum(B4:D4)
3	Bart	174	169	169	512->sum(B5:D5)
4	Nancy	134	125	120	379->sum(B6:D6)
5	Carmie	120	100	145	365->sum(B7:D7)
6	Cathy	176	201	198	575->sum(B8:D8)
7	John	24	31	14	69->sum(B9:D9)
8	Totals	784	824	822	2430->sum(B10:D10)
9	Average	131	137	137	405
10					
11					
12					

Figure 33 Example Spreadsheet

Some of the formulas used in the above spreadsheet are already listed.

The following additional formulas are also used in the above spreadsheet.

- | | |
|--------------------------|-------------|
| 1. SUM(B4:B9) | In cell B10 |
| 2. C4+C5+C6+C7+C8+C9 | In cell C10 |
| 3. D4+D5+D6+D7+D8+D9 | In cell D10 |
| 4. Average(B4:B9) | In cell B11 |
| 5. C10/6 | In cell C11 |
| 6. (D4+D5+D6+D7+D8+D9)/6 | In cell D11 |
| 7. Average(E4:E9) | In cell E11 |

Formulas 2 and 3 accomplish the same task as formula 1. The sum function, used in formula 1, is, however, easier to use and produces results faster.

Formulas 5 and 6 accomplish the same task as formula 4. The average function, used in formula 4, is, however, easier to use and produces results faster.

Another advantage of functions over repeated addition is that if the spreadsheet is enlarged, the functions will adjust and still be accurate while repeated addition will not. For example, assume a row is inserted before row 7. The 7 enumerated formulas will change as follows:

- | | |
|-----------------------|-------------|
| 1. SUM(B4:B10) | In cell B10 |
| 2. C4+C5+C6+C8+C9+C10 | In cell C10 |
| 3. D4+D5+D6+D8+D9+D10 | In cell D10 |
| 4. Average(B4:B10) | In cell B11 |

5.	C11/6	In cell C11
6.	(D4+D5+D6+D8+D9+D10)/6	In cell D11
7.	Average(E4:E10)	In cell E11

Formulas 1, 4 and 7 remain correct.

Formulas 2, 3 and 6 are missing a reference to row 7.

Formula 5 should be C11/7.

Formula 6 should also have /7 instead of /6 in it.

Moral of the story, use the available formulas whenever possible.

ORDER OF PRECEDENCE

The last thing to mention about formulas is order of precedence. Order of precedence is the order in which the formulas are computed.

Order of precedence is:

1. () -- Inner most () computed first.
2. Functions
3. * and /
4. + and -

As a result of the order of precedence, A1+B1/6 is not equal to (A1+B1)/6. In case 1 B1 is divided by 6; the result of which is added to A1 while in case 2 A1 is added to B1 and the sum is divided by 6.

A few examples follow:

$$(5+6/3)*9 = 63$$

The () are done first. / within the () is done before + so the formula is computed as follows. $6/3 = 2$. $5 + 6/3 = 5 + 2 = 7$. $7 * 9 = 63$.

$$(3*(5-10)) * \emptyset = \emptyset$$

The inner most () are done first. $5 - 10 = -5$. $3 * -5 = -15$. $-15 * \emptyset = \emptyset$.

$$(3*(5-10)) * (\emptyset + 1) = -15$$

The inner most () are done first. $5 - 10 = -5$. $3 * -5 = -15$. $(\emptyset + 1) = 1$. $-15 * 1 = -15$.

$$(3*(5-10)) * \emptyset + 1 = 1$$

The inner most () are done first. $5 - 10 = -5$. $3 * -5 = -15$. $-15 * \emptyset = \emptyset$. $\emptyset + 1 = 1$.

When in doubt, use () .

ABSOLUTE CELL REFERENCES

There is often a need to repeat a formula many times for different data values. For example, in Figure 34, the formulas in column B share a common definition. The formulas in row 7 are also similar. The percentages in column B use the following formula:

Total Points
Total Possible

	A	B	C	D	E	F
1			Exam 1	Exam 2	Exam 3	Exam 4
2			100	100	100	250
3	Bob	88.18%	91	91	85	218
4	Julia	94.18%	97	95	100	226
5	Brett	91.82%	98	95	100	212
6	Linda	92.18%	95	92	82	238
7	Averages	92.59%	95.25	93.25	91.75	223.50

Figure 34 Absolute Cell Reference Example

To determine Linda's and Brett's percentages, then, the following spreadsheet formulas:

$\text{sum(C5:F5)}/\text{sum(C2:F2)}$
 $\text{sum(C6:F6)}/\text{sum(C2:F2)}$

could be used in cells B5 and B6, respectively.

Notice that part of the formula remains the same, i.e. sum(C2:F2) , while part of the formula is dependent upon the row in which the formula is placed. That is, part of the formula depends on absolute cell references while part of the formula depends upon relative cell references.

Note that relative and absolute cell references only become important when the COPY command (see page 131) is used. Consider a spreadsheet like the one in Figure 34 with 100 students. Typing 100 versions of the above formula would be tedious and error prone. The COPY command can be used to duplicate the formula once it has been entered. However, the COPY command adjusts the cell references in the formula according to how the formula is copied. For example, if the formula is copied down, all row numbers increase. The COPY command has options to control the updating of formulas, but the user can instead enter a formula in such a way as to make sure that it will copy correctly.

Supercalc, and many other spreadsheets, assume that cell references are of the relative type unless otherwise specified. Entering relative cell references, therefore, consists of typing a column letter followed by a row number.

Entering absolute cell references is a little more complicated. It is possible to make a cell reference absolute with respect to its column or its row or both. For our discussion, we will

only deal with the last option. To enter an absolute cell reference, type a dollar sign, followed by a column letter then another dollar sign and finally the row number.

ABSOLUTE CELL ADDRESS

A cell address that is not dependent upon the location of the formula in relation to the location of the cell being referenced. Examples from above include C2:F2.

ABSOLUTE CELL REFERENCE²⁷

A cell address where a dollar sign (\$) is placed before the column letter and row number. Examples include: \$A\$1, \$D\$9:\$F\$9.

RELATIVE CELL REFERENCE²⁸

Any cell address that does not use dollar signs (\$) as part of the cell address. Examples include: A1, C9:F9.

RELATIVE CELL ADDRESS

A cell address that is dependent upon the location of the formula in relation to the location of the cell being referenced. Examples from above include D5:F5 and D6:F6.

From Figure 34, we could use either of the following formulas in cell B4:

Sum(C4:F4)/Sum(\$C\$2:\$F\$2)
Sum(C4:F4)/Sum(C2:F2)

The first version of the formula uses absolute cell references. If this formula is copied to cells B5, B6 and B7, the copy command will adjust the first part of the formula (the Sum(C4:F4)) but will not adjust the second part of the formula. The formula will be adjusted correctly. We will get the following formulas:

B5 Sum(C5:F5)/Sum(\$C\$2:\$F\$2)
B6 Sum(C6:F6)/Sum(\$C\$2:\$F\$2)
B7 Sum(C7:F7)/Sum(\$C\$2:\$F\$2)

If we use the second version, however, the entire formula will be adjusted and will be incorrect. We will get the following formulas:

B5 Sum(C5:F5)/Sum(C3:F3)
B6 Sum(C6:F6)/Sum(C4:F4)
B7 Sum(C7:F7)/Sum(C5:F5)

which is obviously not correct. We can get the copy command to adjust the formulas correctly, but using absolute cell references, we do not have to.

²⁷Ibid.

²⁸This definition applies in the context of copying formulas only.

The only question remaining, is: When should absolute cell references be used? Before getting to the answer, consider the formulas in cells B9 and C9. The formulas are: Average(B4:B7) and Average(C4:C9). Notice that both formulas compute averages of values that are directly above the formula itself. Comparing this to the formulas used to compute the percentages, we notice that the average formula only depends on values directly above it and that as the formula is copied to the right, all column letters should increase by 1.

From the above brief discussion we can conclude that when writing formulas, if there are cell references in a formula that depend on data in the spreadsheet that is in a fixed location (e.g. the total possible points for the assignments in Figure 36), then it is wise to use absolute cell references.

CLOSING NOTES

Formulas can be any combination of functions, special symbols or numeric literals. They may be no longer than 240 characters in length.

Functions are faster than repeated addition.

Whenever the contents of a cell change, all formulas are recomputed²⁹. This means that formulas will always display a current value.

²⁹This may not be the case if one of the Global commands has been used. See discussion of GLOBAL in the next chapter.

ASSIGNMENTS

- Give three examples, other than ones available in the book, of real world uses of spreadsheets. Justify your answers. (15)
- Given the following spreadsheet:

Compute the result of the following formulas. Note that not every formula makes reference to the spreadsheet.

- a. $6*4+3$
- b. $6*(4+3)$
- c. $C2/B3$
- d. $B1+B1/C1$
- e. $(B1+B1)/C1$
- f. $C1/B1+B1+B1+B1$
- g. $C1/4*B1$
- h. $\text{AVERAGE}(A3:C3)$
- i. $\text{AVERAGE}(A3:C3)/A3+B3+C3$
- j. $\text{AVERAGE}(A3:C3)/(A3+B3+C3)$
- k. $\text{SUM}(A1:A3)$
- l. $C1/(4*B1)$
- m. $\text{SUM}(A1:C3)$
- n. $\text{AVERAGE}(A1:C3)$

(14 points)

- For each of the following questions, write the result of the formula (see Figure 36).

- a. `lookup(100,A1:A7)`
- b. `lookup(99.99,A1:A7)`
- c. `lookup(10000,A1:A7)`
- d. `5*lookup(5,A1:A7)`
- e. `lookup(1000,A1:A7)/lookup(10,A1:A7)`

Assume cell C1 contains the value 42.4 for the following three questions.

- f. `lookup(c1,A1:A7)`
- g. `lookup(2*c1,A1:A7)`
- h. `lookup(100*c1,A1:A7)`

(10 points)

	A	B	C
1	48	32	128
2	27	65	42
3	13	21	17

Figure 35 Assignment 2

	A	B
1	0	1
2	10	2
3	100	3
4	1000	4
5	10000	5
6	100000	6
7	1000000	7

Figure 36 Another Lookup Table

Chapter 10 -- SuperCalc Command Reference

PURPOSE: The purpose of this chapter is to cover the commands and SuperCalc specific concepts necessary to complete the assignments.

SuperCalc has two modes of entry, the first is data entry and the second is command entry.

Data entry is accomplished by:

1. positioning the spreadsheet cursor on the cell that will hold the data,
2. entering the data on the entry line and
3. pressing <enter>.

Command entry is accomplished by:

1. pressing / (slash) on a blank entry line and
2. typing the first letter of the desired command.

This chapter is devoted to a command reference of SuperCalc 4. Knowledge of it will be assumed in future chapters.

SuperCalc COMMANDS

Blank	Clear a range of cells.
Copy	Copy data from one place to another.
Delete	Remove rows or columns.
Edit(<F2>)	Modify an entry.
Format	Format a range of cells. DO NOT confuse this with the DOS format command. This format command allows the user to define how numerical and textual data will appear.
Global	Change the global operations of the spreadsheet.
Insert	Insert blank rows or columns into the spreadsheet.
Load	Retrieve a spreadsheet file from disk.

Move	Move a range of cells.
Output	Print a range of cells to some device. (Normally the printer.)
Quit	Exit from SuperCalc.
Save	Save the current spreadsheet to a disk file.
Zap	Clear the contents of the current spreadsheet. This command is not reversible. Make sure to save the spreadsheet before using.
?(<F1>)	Context sensitive help. This command does not require a slash (/) before it.

COMMAND SYNTAX

A command syntax is a generic description of how to use a command. Each command syntax will be followed by an example.

NOTES:

It is only necessary to type the / (slash), upper case letters and any underlined commas. (This last note applies primarily to the copy and move commands.)

<range> is a range of cells.

Some things have been abbreviated to fit each command onto one line.

BLANK

/Blank,<range><enter>

Examples:

/Blank,A1<enter>

Blank cell A1.

/Blank,B1:C3<enter>

Blank cells: B1, B2, B3, C1, C2 and C3.

/Blank,D<enter>

Blank column D. (All cells)

/Blank,<center>

Blank the current cell.

COPY

/Copy,<from range><enter><to range>,[No-adj][Ask][Values][+, -, * /]

Notes:

By default, relative cell references are adjusted when copied. For example, assume say that the formula $SUM(A1:A10)$ is entered in to cell B1. If this formula is later copied into cell C1 and the formula is adjusted, the formula will change to $SUM(B1:B10)$. If the formula is copied to cell D1 it will change to $SUM(C1:C10)$.

Any formula copied DOWN (i.e. copied to a lower row, higher row number) and adjusted will cause all row numbers increase. Any formula that is copied to the RIGHT (e.g. copied from column A to D) and is adjusted will cause all column references to increase. The converse is true if formulas are copied UP or to the LEFT.

The [Ask] option of the copy command will display each cell reference in the formula being copied and ask whether the cell reference should be adjusted.

It is not necessary to specify anything after the <to range> if absolute cell references have been used (see page 125).

Examples:

/Copy,A1,B4,No-adjust

Copies the contents of cell A1 to cell B4. Any cell references in cell A1 remain the same when copied to B4.

/Copy,A,B<enter>

Copies all of column A to column B. Any formulas in column A are adjusted when copied to B.

/Copy,A,B,No-adjust<enter>

Copies all of column A to column B. Any formulas in column A are unchanged when copied to column B.

DELETE

/Delete,[Row][Column][Block][File],<range> or <filename>

Notes:

When the [Row] option is used, <range> will specify a range of rows like 1:4 for rows 1 through 4.

When the [Column] option is used, <range> will specify a range of columns like D:G for columns D through G.

When the [Block] option is used, this command works just like the blank command.

This command CANNOT be reversed. Caution is advised.

Examples:

/Delete,Row,4<enter>

Row 4 will be deleted and all rows from 5 down will move up.

/Delete,Column,A:D<enter>

Columns A through D will be deleted. All columns after D will move left to fill the gap.

/Delete,Row,<enter>

The current row will be deleted.

/Delete,Column,<enter>

The current column will be deleted.

FORMAT

/Format,[Global][Column][Row][Entry][Define], (What occurs after this step varies depending on which of the options is chosen.

The [Global] option is used to change the entire spreadsheet. When chosen, the following options will appear:

[Accept][Integer][General][Exponential][\$][Right][Left][Text][*]
[User-defined][Hide][Display][Width]

Accept Accept the current settings.

Integer	Numbers will appear as integers. Any decimal places will be dropped. No rounding will occur.
General	Numbers appear as they will best fit.
Exponential	Numbers will appear in scientific notation.
\$	Numbers will appear with two decimal places and will be rounded.
Right	Numbers will be right justified. (They will all line up on the right side of the cell)
Left	Numbers will be left justified. (They will all line up on the left side of the cell)
Text	Change how text will appear on the screen. After selecting this option, you will have to choose between the following:
Left	Text will be left justified. (default) That is lined up on the left.
Right	Text will be right justified. That is straight on the right.
Center	Text will be centered in the column if it is not too long to fit in the column.
*	Numbers will appear as a series of *'s. For example, the number 5 will appear as *****.
User-Defined	More on this later.
Hide	Hide entries.
Display	Display entries that have been hidden.
Width	Change the width of columns.

The [Column] option is used to change entire columns in the spreadsheet. All options for Global apply for column. When this option is selected, <range> refers to a continuous section of columns. After defining <range>, the same options as for Global will be displayed. The main difference is the scope of the command. [Global] refers to the entire spreadsheet while [column] refers to columns.

The [Row] option is used to change entire rows. All options for [Column] apply EXCEPT for [Width]. The [Width] option only applies to [Global] and [column].

The [Entry] option is used to format a <range> cells. The range is specified as two cell addresses separated by a colon. All options available for [Row] applies for [Entry].

USER-DEFINED FORMATS

The [User-Defined] option allows the user to define HOW numbers will appear on the screen. This command only DEFINES how numbers will appear. A second step using /Format,[Column][Row][Entry] must be used to actually USE a defined format.

There are eight user-defined formats available, numbered 1 - 8. The number of the user-defined format has no bearing on where or how often it can be used, it is a numbering system used to keep track of them.

If this option is selected, a screen resembling Figure 37 will be displayed.

Floating \$	The number will appear with a \$ before it.
Embedded Commas	The number will have a comma every three decimal places to the left of the decimal.
Minus in ()	Negative numbers will be in ().
Zero as Blank	Zero results will appear as a blank cell.
%	The number will be treated as a percentage. $1 = 100\%$. The % symbol will appear after the number.
Decimal Places	Defines the number of decimal places to retain.
Scaling Factor	Allows numbers to be divided by a power of ten. $0 = 1, 1 = 10, 2 = 100, 3 = 1000 \dots$ The number in a given cell will be divided by this number.

For example, to display the number in cell A1 as a percentage with one decimal place, do the following:

1. Type the following:
/Format,Define
2. To change user-defined format 1, move the cursor to column labeled 1. (This column is NOT a spreadsheet column! Spreadsheet columns are lettered, not numbered!) Select the option to change with up and down cursor keys.

NOTE: The cursor starts where the underline is in Figure 37 above.

3. A dollar sign will generally not be used with percentages, so change the Y in column 1 of the "Floating \$" row to an N by typing N.
4. Commas are not desired, so cursor down to the Embedded Commas row and change the Y in column 1 to an N by typing N.
5. This IS a percentage, so cursor down to the % row and change the N to a Y.
6. Only 1 decimal place is desired, so cursor down to the decimal places row and change the 2 to a 1.
7. Hit *<esc>* to go back one step.
8. At this point User-defined format 1 has been defined to format numbers for percentages with one decimal place. This format will not take effect until it is used.

	User-defined formats							
	1	2	3	4	5	6	7	8
Floating \$	Y	Y	Y	Y	Y	Y	Y	Y
Embedded Commas	Y	Y	Y	Y	Y	Y	Y	Y
Minus in ()	N	N	N	N	N	N	N	N
Zero as Blank	N	N	N	N	N	N	N	N
%	N	N	N	N	N	N	N	N
Decimal Places	2	2	2	2	2	2	2	2
Scaling Factor	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
<i>-> A1</i>								
Y(es) or N(o) ?								
16>/Format,Define,								
MENU Precede numbers with a dollar sign - \$xxxx								

Figure 37 UDF Screen

Hitting the <esc> key took you back to where SuperCalc will be displaying /Format on the entry line.

The options are [Global][Column][Row][Entry][Define]. To format cell A1 to be a percentage with one decimal place, pick [Entry].

/Format,Entry,

9. SuperCalc expects a range after selecting Entry. Type the following:

A1<enter>

10. Next, a long list of the formats available will be displayed. Choose User-defined format 1. (It is the one we changed) Type:

U1

SuperCalc will have:

/Format,Define,User-defined1,

11. Finally type:

A

for [Accept]. The entry in cell A1 will appear with one decimal place and have the percent sign following it.

Additional Format Examples

/Format,Global,Width,10<enter>

All columns will be changed to 10 characters wide. (9 is the default) Hitting <enter> after selecting the desired format is equivalent to selecting [Accept].

/Format,Row,3:5<enter>,Integer,<enter>

All numerical entries in rows 3 through 5 will appear without decimal places.

/Format,Entry,B4<enter>,TextRight<enter>

Any text in cell B4 will be right justified. Type T for text and R for right.

/Format,Row,3:10<enter>,User-defined2<enter>

All numbers in rows 3 through 10 will appear as defined by user define format 2, whatever that may be.

See page 140 for notes on how format affects repeating text.

GLOBAL

/Global,[Manual][Border][Auto]

Notes:

There are many more options but they will not be covered here.

The [Manual] option will cause formulas to NOT recalculate unless an ! is typed on a blank entry line. This option is useful when dealing with large spreadsheets. Turning off automatic calculation makes the entry of numbers go much quicker.

The [Auto] option will cause formulas to constantly recalculate. It turns off the [Manual] option.

The [Border] option will toggle the border on and off.

INSERT

/Insert,[Row][Column][Block],<Range>

The [Row] option will insert rows at the desired range.

The [Column] option will insert columns at the desired column.

The [Block] option will move a block down or to the right as specified.

Examples:

/Insert,Row,<Enter>

Make a blank row at the current row. All rows from the current row down will be pushed down.

/Insert,Column,<enter>

Make a blank column at the current column. All columns from the current column to the right will be pushed to the right.

/Insert,Row,3:5<enter>

Rows 3 through 5 will become blank. All rows from row 3 on will be moved down three rows.

LOAD

/Load,<filename><enter>[All]

NOTE: There are more options than [All] but this is the only option that will be covered here.

If the file name is not known, press <F3> to get a list of spreadsheet files. There will be a list of SuperCalc files and a large, spreadsheet like, cursor that can be positioned on the desired file. Once the cursor is on the desired file name, press <enter>.

DO NOT load a spreadsheet unless the screen is clear. If a spreadsheet is loaded when one is already there, the two spreadsheets will be merged in an unpredictable way.

MOVE

/Move,[Block][Row][Column],<From Range><enter> <To Range><enter>

The [Block] option will allow a block of text to be moved. The <to range> being copied over will be lost.

The [Row] option allows a row or rows to be moved. The <to range> will shift back to fill the gap made by moving rows.

The [Column] opinion allows a column or columns to be moved. The <to range> will shift back to fill the gap made by moving columns.

Examples:

/Move,Row,1,2<enter>

Row 1 will move after row 2. Row 2 will move up. (Row 1 and 2 will be switched)

/Move,Column,C:F,I<enter>

Columns C through F will be moved to I through L. Columns I through L will be moved to C through F.

/Move,Block,A1,B1<Enter>

Cell A1 will be moved to cell B1. The contents of B1 will be lost.

OUTPUT

/Output,[Printer],[Range][Go][Page]
/Output,[File],<Filename>,[Range][Go][Page]

The [Printer] option will print the file to the printer.

The [File] option will print the file to a disk file.

[Range] defines how much of the spreadsheet will be printed. Examples of ranges:

All	All of the spreadsheet.
A	Just row A.
A1:B5	A1,A2,A3,A4,A5,B1,B2,B3,B4,B5 will be printed.

[Go] starts the printing.

[Page] forces the printer to form feed.

Examples:

/Output,Printer,Range,ALL<enter>,Go

Print the entire spreadsheet. When printing, SuperCalc will pause and wait for a key press to begin the printing.

/Output,Printer,Range,A1:B5<enter>,Go

Print cells A1,A2,A3,A4,A5,B1,B2,B3,B4,B5.

QUIT

/Quit,[Yes][No]

[Yes] will take you out of the program.

[No] will not take you out of the program

NOTE: Once you have quit out of the program, all work is lost if not saved. Make sure to save the spreadsheet before quitting.

SAVE

/Save,<Filename>,[All]

Save all of the current spreadsheet. When naming your file, use only 1 - 8 letters or numbers, DO NOT USE A period (.) or an extension! This will make it harder to retrieve a file.

If the file name entered already exists on the disk, SuperCalc will ask you if you wish to Backup the old file, Overwrite the old file or change the file name.

ZAP

/Zap,[Yes][No]

Examples:

/Zap,Yes (You need not press <enter>)

Clear the current spreadsheet. This is not reversible! Save your work before using the command.

/Zap,No (You need not press <enter>)

Cancel the Zap command.

Always remember to use this command between spreadsheets. You NEED to use this command to clear the current spreadsheet before going on the next spreadsheet.

FORCED TEXT

When entering information, it is sometimes necessary to let SuperCalc know whether an entry is numerical or textual data. For example, if a social security number, such as 483-80-2712, is entered, SuperCalc will see this as a formula and display -2309.

When an entry could be interpreted as a formula or number but it should be textual data, precede it by " (quotation marks).

REPEATING TEXT

If an entry is preceded by an ' (apostrophe), the entry will be repeated across the screen. The ' is used for repeating text. If '+' is entered, a line of +++++++ will be seen on the screen as far as the +'s can repeat. Repeating text will stop when it comes across a non-blank cell or a cell that has been formatted.

ASSIGNMENTS

ASSIGNMENT #1

Instructions:

Type the answers to each of these questions. Assume that each command is executed consecutively. i.e. Command 2 is affected by command 1, command 3 is affected by commands 2 and 1 ...

There may be multiple answers to each of the following questions.

- a. Write the command(s) necessary to retrieve a spreadsheet called GRADES from disk. (2)
- b. Write the command(s) necessary to delete the 4th column (lettered D) from the spreadsheet retrieved in step a. (2)
- c. Write the command(s) necessary to print the entire spreadsheet. (4)
- d. Write the command(s) necessary to retrieve, with predictable results, a spreadsheet called TAXES. (Consider step a!) (4)
- e. Write the command(s) necessary to format all numbers in column A to integer format. (2)
- f. Write the command(s) necessary to format all text in rows 4, 5, 6 and 7 to text right. (2)
- g. Write the command(s) necessary to format the range C2:D6 to the \$ format. (2)
- h. List all cells affected by step g. (5)
- i. Write the command(s) necessary to format columns A, B, C, E and F to be 12 characters wide. (4)
- j. What commands are necessary to place repeating text in A1. (This is a trick question.) (3)

Total points possible: 30.

Supercalc's built-in functions are organized into several categories. This chapter describes the functions in each category. The first section, "Mathematical Functions," contains functions for arithmetic, trigonometry, logarithms, and other mathematical operations. The second section, "String Functions," contains functions for manipulating strings of characters. The third section, "Date and Time Functions," contains functions for working with dates and times. The fourth section, "Logical Functions," contains functions for performing logical operations. The fifth section, "Database Functions," contains functions for working with databases. The sixth section, "File Functions," contains functions for working with files. The seventh section, "User-defined Functions," contains functions that you can define yourself.

Chapter 11 -- SuperCalc Tutorial

The objective of this chapter is to create spreadsheet 1 in Figure 38, edit it to look like spreadsheet 2 in Figure 39, and to finally add a lookup table to .

MAKE SURE TO WATCH the computer screen while you do the tutorial. If you do not you might as well not waste your time doing it.

	A	B	C	D	E	F
1				Test 1	Test 2	Test 3
2	SSN	Grade	Pct.	100	100	100
3	0042	C	.78	70	84	80
4	1123	B	.86	95	98	65
5	4432	C	.7733333	67	77	88
6	2123	A	.8633333	79	89	91

Figure 38 -- Spreadsheet 1

	A	B	C	D	E	F	G	H	I
1				Test 1	Test 2	Test 3	Grade	Table	
2	SSN	Grade	Pct.	100	100	100	Pct.	Grade	
3									
4	0042	C	78.0%	70	84	80		.0% F	
5	1123	B	86.0%	95	98	65		50.0% D	
6	4432	C	77.3%	67	77	88		70.0% C	
7	2123	B	86.3%	79	89	91		80.0% B	
8									
9	Avgs	B	81.9%	77.75	87.00	81.00		90.0% A	

Figure 39 -- Spreadsheet 2

1. Get into SuperCalc 4.
2. Move the spreadsheet cursor (called cursor hereafter) to cell D1. (From A1 hit the Right arrow key 3 times)

3. Type:
Test 1<Enter>

You probably noticed that the cursor moved to cell E1 (or in some other direction). When <enter> is pressed, the cursor moves in the same direction as the last cursor movement. Keep this in mind for later.

4. Position the cursor in cell E1. (It may already be there.)

5. Type:
Test 2<Enter>

6. If the cursor did not move to cell F1 move it there.

7. Type:
Test 3<Enter>

8. Move the cursor to cell A2. The quickest way is to hit the <Home> key, which takes the cursor to cell A1, and press the <down arrow> key.

9. Type:
SSN:<enter>

NOTE: SSN is capitalized.

10. The cursor moved down to cell A3 after typing <enter> if step 8 was followed. If it did not then move the cursor to cell A3.

11. Type:
0042<enter>

Notice that the number displayed in cell A3 is 42. Supercalc removes leading zeros on numbers since they convey no useful information. We want the leading zeros to make it obvious that the number displayed is the last four digits of each student's social security number. This will be fixed in the next step.

12. Type:
"0042<enter>

Notice the use of a quotation mark ("') this time, it is used to tell SuperCalc to treat this entry as text and enter it verbatim. This time the leading zeros are displayed. Later we will discover that this step was necessary to allow the entry to be centered in the column.

13. If the cursor did not move down to cell A4 then move it to cell A4.

14. Type:
"1123<enter>
15. If the cursor did not move down to cell A5 then move it to cell A5.
16. Type:
"4432<enter>
17. If the cursor did not move down to cell A6 then move it to cell A6.
18. Type:
"2123<enter>
19. Move to cell B1 and hit the down arrow key to move to cell B2. By doing so, the cursor will move down every time you press <enter>.
20. Type:
Grade<enter>

Notice that the quotation mark ("") was not necessary because this will be interpreted as text.

21. If the cursor did not move to cell B3 then move the it to B3.
22. Type:
C<enter>
23. Move the cursor to cell B4. Note that the If the cursor did not move to cell B4 then move it to B4.
24. Type:
B<enter>
25. If the cursor did not move to cell B5 then move it to B5.
26. Type:
C<enter>
27. If the cursor did not move to cell B6 then move it to B6.
28. Type:
A<enter>

29. Each time an entry has been made, the cursor should have moved in the direction that it was last moved. So, if you moved the cursor with the <down arrow>, every time you press <enter>, the cursor moves down.

This time, we are going to use the goto command to move the cursor. The goto command is entered by typing =<cell address>, where <cell address> is the location we want to move to. We want to move the cursor to cell C2, so type the following:

=C2<enter>

This accomplishes two things. First, the cursor moved to cell C2. Second, the next time we enter text, the cursor will move in the same direction it was moving before we typed the goto command. This makes making columnar or row-wise entry simpler.

30. Type:

Pct.<enter>

31. Position the cursor in cell C3 if it is not already there. Cell C3 will contain the first formula.

32. Type:

SUM(D3:F3)/SUM(\$D\$2:\$F\$2)<enter>

The word "ERROR" will be displayed in the spreadsheet. This is OK!

The formula does the following:

$$\frac{\text{TotalPointsReceived}}{\text{TotalPossiblePoints}}$$

This formula computes the percentage of points received. To understand this formula, first look at Figure 38, page 143. The cells D3, E3 and F3 contain the grades received by the person with an SSN of 0042. SUM(D3:F3), therefore, computes the total points received for the three tests.

The cells D2, E2 and F2 contain the total possible points for each test. SUM(\$D\$2:\$F\$2), therefore, computes the total possible points. Notice, however, that these cell addresses contain dollar signs. This does not mean that the cell reference is a dollar amount, it means that the cell is an absolute cell reference. An absolute address is used in a formula when a cell reference that will never move is needed. Since the first

part of the formula, which computed the total points received by one person, will change when the formula is copied to from cell C3 to C4, (i.e. for the second person the first part of the formula will be $SUM(D4:F4)$) that part of the formula should change. However, the second part of the formula, the total possible points, is always in a fixed location, and as such, it should never move (i.e. for the second person, the second part of the formula should be $SUM($D$2:$F$2)$).

33. This formula can be retyped or it can be copied. To copy it type the following:

/CC3<enter>C4:C6<enter>

Here again, ignore the word "ERROR". This error is a result of a division by zero and will shortly be fixed.

This line will look like the following:

/Copy,C3,C4:C6

Note that part of the formula will adjust while part of the formula will not adjust. This is accomplished via the use of absolute cell references.

Remember, when copying a formula, all relative cell references will be adjusted unless told otherwise.

The formula takes the sum of scores for a given student (in the case of row 3 its $78 + 87 + 79$ or D3:F3) and divides the sum by the total possible points. ($100 + 100 + 100$ or D2:F2).

When the formula is copied, the reference to the total possible points ($100 + 100 + 100$) should stay the same (it does not move). The sum of scores for each student, however, should be adjusted because each student is on his/her own line.

34. Move the cursor to Cell D2. (See step 29, page 146.)

35. Type:

100<enter>

Notice that all ERRORS changed to 0.

36. Position the cursor in cell D3 if it is not already there.

37. Type:
70<enter>
Cell C3 should change to .70.
38. Position the cursor in cell D4 if it is not already there.
39. Type:
95<enter>
Cell C4 should change to .95.
40. Position the cursor in cell D5 if it is not already there.
41. Type:
67<enter>
Cell C5 should change to .67.
42. Position the cursor in cell D6 if it is not already there.
43. Type:
79<enter>
Cell C6 should change to .79.
44. Move the cursor to Cell E2. (See step 29, page 146.)
45. Type:
100<enter>
All the numbers in column C just changed again.
46. Move the cursor to cell E3 if it is not already there.
47. Type:
84<enter>
48. Move the cursor to cell E4 if it is not already there.
49. Type:
98<enter>
50. Move the cursor to cell E5 if it is not already there.

51. Type:
77<enter>
52. Move the cursor to cell E6 if it is not already there.
53. Type:
89<enter>
54. Move the cursor to Cell F2. (See step 29, page 146.)
55. Type:
100<enter>
56. Move the cursor to cell F3 if it is not already there.
57. Type:
80<enter>
58. Move the cursor to cell F4 if it is not already there.
59. Type:
65<enter>
60. Move the cursor to cell F5 if it is not already there.
61. Type:
88<enter>
62. Move the cursor to cell F6 if it is not already there.
63. Type:
91<enter>

64. Print the spreadsheet out by typing the following: (See page 139.)

/OpRALL<enter>G<Space Bar>PQ

You will see the following:

/Output,Printer,Range

The word "ALL" is typed, but it, along with the word "Range", disappears after pressing <enter> for the first time. The "G" stands for "Go" to start printing. <Space bar> tells Supercalc to start printing since the printer (hopefully) already has paper. P tells Supercalc to move the printer to the beginning of a new page. Finally, Q tells Supercalc we are done with this command.

65. Save the spreadsheet with the following command:

/Sgrades<enter>A

You will see:

/Save,Grades,All

The spreadsheet should look like Figure 38, page 143. Next we'll format the spreadsheet to look like Figure 39, page 143.

66. Move the cursor to Cell A3. (Any cell in row 3 is ok but go to A3 anyway)

67. Type: (See page 137.)

/IR<enter>

I for insert and R for row.

A blank row will appear at row 3.

68. Make sure you are in cell A3, if not go there.

69. Type: (See page 140, repeating text.)

'=<enter>

70. Move the cursor to cell G3, and type the following:

"<enter>

This turns off repeating text starting in column G for row 3.

71. Move the cursor to cell A8.
72. Type: (See page 140, repeating text.)
'=<enter>
73. Move the cursor to cell G8, and type the following:
"<enter>"

Here again, this turns off repeating text starting in column G for row 8.

74. Move to cell A9.
75. Type:
Avgs<enter>
76. Move to cell B9 and type: (See page 121.)
Average(B4:B7)<enter>
77. Move to cell C9 and type: (See page 121.)
Average(C4:C7)<enter>
78. Move to cell D9 and type: (See page 121.)
Average(D4:D7)<enter>
79. Move to cell E9 and type: (See page 121.)
Average(E4:E7)<enter>
80. Move to cell F9 and type: (See page 121.)
Average(F4:F7)<enter>

These last three commands enter the formulas necessary to get an average for tests 1 through 3. The next steps will format the spreadsheet.

81. Type: (See page 132.)
/FED1:F1<enter>TR<enter>

F for format. E for entry. D1:F1 for the range. <enter> to end the range. T for text. R for Right.

The text in cells D1, E1 and F1 will become right justified.

82. Type: (See page 132.)
/FEA2:B2<enter>TC<enter>

F for format. E for entry. A2:B2 for the range. <enter> to end the range. T for text. C for center.

83. Type: (See page 132.)

/FEC2<enter>TR<enter>

F for format. E for entry. C2 for the range. <enter> to end the range. T for text. R for right.

84. Type: (See page 132.)
/FEA4:B7<enter>TC<enter>
/FEA9:B9<enter>TC<enter>

F for format. E for entry. A4:B7 for the range. <enter> to end the range. T for text. C for center. And again the same thing for range A9:B9.

85. Type: (See page 132.)
/FED9:F9<enter>\$<enter>

F for format. E for entry. D9:F9 for the range. <enter> to end the range. \$ for dollars and cents format.

This last part is rather confusing. In Supercalc, \$ format gives two decimal places only. A \$ does not appear in front of the number, nor do commas appear between every group of three digits to the left of the decimal place.

86. Set up user-defined format 1, (see page 135) for percentages with one decimal place. To do so, type the following:

/FD

/ since this is a command.

F for the format menu.

D to define a new format.

We are going to change user defined format #1. The cursor is across from floating \$ and directly under 1. We want to remove dollar signs, so type:

N

Next, type the <down arrow> key to move to the Embedded Commas row. We do not want commas, so type:

N

Type the <down arrow> key three times (we do not need to change the Minus in () or Zero as Blank rows). The cursor should be under column 1 and directly across from the % sign. We want this to be a percentage, so type:

Y

Finally, we want to set the number of decimal places to 1. To do this, press the <down arrow> key and type:

1

At this point, user defined form #1 has been changed to be a percentage with one decimal place. To leave the user defined format screen, press the Ctrl-<Break>. The <Break> key is the <Pause> key which is two keys to the right of the <Print Screen> key.

87. To use the format just created, type the following: (See page 132.)
/FEC4:C7<enter>U1<enter>

F for format. E for entry. C4:C7 for the range. <enter> to end the range. U for User-Defined. 1 for user-defined format 1.

88. We also want the average in C9 to be displayed with the same format as used in cells C4:C7. To format C9 for percentage format, do the following: (See page 132.)
/FEC9<enter>U1<enter>
89. Finally, we need to change the width of the columns. The columns are the following widths: 5, 7, 7, 9, 9, 9 for columns A, B, C, D, E and F. First change column A, type the following:

/FCA<enter>W5<Enter>

F for format. C for column. A for column A. <enter> to end the range. W for width. 5 for 5 characters wide. <Enter> to end the command.

90. Since columns B and C are to be the same width and are next to each other, we can format both of them at the same time. Type the following:

/FCB:C<enter>W7<Enter>

F for format. C for column. B:C to specify columns B and C. <enter> to end the range. W for width. 7 for 7 characters wide. <Enter> to end the command.

The rest of the columns are 9 characters wide and as such do not need to be formatted. (The default column width is 9 characters.)

91. Print the spreadsheet. (See step 64, page 150.)

92. Save the changes to the spreadsheet. Use the following command:

/S<enter>OA

S for save.

<Enter> accepts the default name.

O for overwrite existing file.

A to save the entire file.

Since the spreadsheet was previously saved, pressing <enter> after /S tells SuperCalc to accept the current name. This spreadsheet file already exists on the disk, so SuperCalc asks what to do with the old file. You want to Overwrite it because the spreadsheet on the screen is more current. Finally, the All tells SuperCalc to save the entire SpreadSheet.

There is one major problem with the spreadsheet as it currently stands, and it has to do with the use of formulas. To compute a student's percentage, we took their points divided by the total possible points. If we change their grades, the formula for percentage changes to reflect the new percentage. This does not carry over into the letter grades, however. Since we typed the letter grades without a formula, they will never change, unless we remember to change them if necessary. To remedy this, we will add a lookup table to the spreadsheet.

A lookup table compares one numerical value to a collection of ascending numerical values (e.g. \emptyset , .5, .7, .8 ...) contained somewhere in the spreadsheet, finds the value closest to, but not larger than, the values in the range, and returns the value in the adjacent cell. If this does not make any sense (as I suspect it may not), continue with the tutorial, and it should after finishing the tutorial.

93. We are now going to add a lookup table to the spreadsheet to compute letter grades based on percentage. To begin, move the cursor to cell H1. Type the following:
Grade Table<enter>

94. Move to cell H2 and type the following:
Pct.<enter>
95. Move to cell I2 and type the following:
Grade<enter>
96. Move to cell H3 and type the following:
'<enter>

This gives us repeating text beginning in column h, row 3. However, the text will repeat until we tell it to, so in the next step we'll stop the repeating text.

97. Move to cell J3 and type the following:
"<enter>

That is, cell J3 contains a textual entry. The entry is blank, but this will stop text from repeating beyond cell I3.

Next, we need to determine our grade table (see Figure 40).

Note that the percentages are arbitrary and can be changed at any time. However, the numbers must grow from the bottom of the table to the top. Also, the first number must be small enough to handle the smallest number. Since percentage cannot go below 0, this is not a problem.

98. First we will enter the column of percentages. Move to cell H4, and type:
0<enter>
99. Move to cell H5, and type:
.5<enter>

Remember that $50\% = 0.50$. We used User-Defined format #1 to make our percentages look more familiar.

100. Move to cell H6, and type:
.7<enter>
101. Move to cell H7, and type:
.8<enter>
102. Move to cell H8, and type:
.9<enter>

Min %	Letter Grade
0.0	F
50.0	D
70.0	C
80.0	B
90.0	A

Figure 40

103. Next, we will format these cells to appear the same as cells C4 through C7. To do so, type the following: (see step 87, 88, page 153)
/feH4:H8<enter>u1<enter>

Next we will enter the column of grades. Before we do this, however, some explaining is necessary. A cell reference is used for formulas, and it returns the numerical value contained in a cell. For example, if D4+D5 is entered in to cell A1Ø, the numerical result of 7Ø+84, or 154, will be displayed. On the other hand, if the formula A2+B2 is entered in to cell A1Ø, the numerical result of Ø+Ø, or Ø, will be displayed. This is because all textual entries have a numerical value of Ø. If we try to put the letters F through A in cells I4 through I8, the numerical values in those cells will all be zero. To force a numerical entry to be treated as a textual entry, we use quotation marks before the entry (see step 12, page 144). To force a textual entry to be treated as a numerical entry, begin the textual entry with (" and end it with "). To enter F as a numerical entry, then, the following should be typed: ("F"). Knowing this, we can continue with the tutorial.

104. Move the cursor to cell I4, and type:
("F ")<enter>

There are 3 spaces after the letter F. These spaces are used to make sure that the letter will be centered when it is used in column B (yes B).

105. Move the cursor to cell I5, and type:
("D ")<enter>

106. Move the cursor to cell I6, and type:
("C ")<enter>

107. Move the cursor to cell I7, and type:
("B ")<enter>

108. Move the cursor to cell I8, and type:
("A ")<enter>

Finally, we need to format columns H and I to be 6 and 5 characters wide, respectively.

109. To format column H, type the following:
/FCH<enter>W6<enter>

110. To format column I, type the following:
/FCI<enter>W5<enter>

Now we are ready to use this lookup table to compute letter grades based on percentages.

111. Move to cell B4, and type:
`lookup(C4,H4:H8)<enter>`

This formula will compare the value in cell C4 (currently 78.0%) to the values in cells H4 through H8. Supercalc will find the value the value that is closest to, but not larger than, 78.0% (in this case that is 70.0%), and return the value in the cell adjacent cell (in this case that is ("C ")). As a result, the numerical value ("C ") will be displayed in cell C4. (Note that we used absolute cell references for the lookup table since its location is fixed.

112. Move to cell B5, and type:
`lookup(C5,H4:H8)<enter>`

This formula will compare the value in cell C5 (currently 86.0%) to the lookup table, and return the value that is closest to, but not larger than, 86.0%. In this case, the closest value is 80.0%, so the contents of cell I7 (in this case ("B ")) will be displayed in the cell B5.

113. Type the following two commands to copy the formula to the remaining three cells:

`/CB5<enter>B6:B7<enter>
/CB5<enter>B9<enter>`

114. Print the entire spreadsheet with the following command:
`/OPRall<enter>G<space bar>PQ`

115. Print the entire spreadsheet again with the following command (note that this will result in a long printout!):
`/OCALL<enter>P<enter>`

116. Save the changes to the spreadsheet. Use the following command:
`/S<enter>OA`

S for save.

<Enter> accepts the default name.

O for overwrite existing file.

A to save the entire file.

Since the spreadsheet was previously saved, pressing <enter> after /S tells SuperCalc to accept the current name. This spreadsheet file already exists on the disk, so SuperCalc asks what to do with the old file. You want to Overwrite it because the spreadsheet on

the screen is more current. Finally, the All tells SuperCalc to save the entire SpreadSheet.

117. Type the following to quit out of SuperCalc.
/QY

Q for quit.

Y to answer Yes.

Note, you should have 4 printouts from this tutorial. The printouts were received from steps 64, 91, 114 and 115. Make sure to label each printout, and staple the pages together.

Total points for the tutorial: 50

Chapter 12 -- SuperCalc Assignments

ASSIGNMENT #1

	A	B	D	F	G	H	I	J	K
1	Basic Computer Stuff 101								
2				Asgn	Asgn	Asgn	Exam	Exam	Final
3				1	2	3	1	2	Exam
4									
5	Name	SSN	Pct.	30	25	40	50	50	100
6									
7	Baines, Bob	4028	77	27	20	31	42	37	71
8	Chekov, Nancy	3329	#	22	19	29	38	45	75
9	Elepon, Francis	0978	#	22	20	30	43	40	79
10	Glover, Fred	1292	#	22	22	32	35	43	89
11	Han, Kal	4908	#	26	21	35	42	45	77
12	Marl, Linda	1155	#	22	22	32	42	37	71
13	Millan, Susan	3456	#	26	19	35	35	43	71
14	Rundgren, Todd	8956	#	23	18	28	40	41	79
15	Schuchert, Brett	2712	#	22	20	30	44	41	75
16	Warren, Larwence	0031	#	27	19	35	42	44	81
17									
18	Averages			##	24	##	##	##	##

Figure 41 SuperCalc Assignment #1

NOTES:

1. Create the spreadsheet contained in Figure 41. Use formulas wherever bold numbers or pound (#) signs are used. Columns C and E are each 1 character wide.
2. Print the entire spreadsheet. (20)

ASSIGNMENT #2

	A	B	C	D	E	F	G
Charmer's Bowling League							
1							
2							
3							
4	Team 1						
5		Fran		156	167	167	178
6				167	168	187	167
7				178	187	167	199
8							
9		Totals		501	###	###	###
10		Averages		167.0	###.0	###.0	###.0
11							
12		Fred		200	178	200	231
13				234	209	250	224
14				201	198	220	224
15							
16		Totals		###	###	###	###
17		Averages		###.0	###.0	###.0	###.0
18							
19		Lou		198	178	200	231
20				234	200	225	224
21				201	198	220	209
22							
23		Totals		###	###	###	###
24		Averages		###.0	###.0	###.0	###.0
25							
26		Linda		225	202	210	250
27				234	212	230	224
28				220	210	220	230
29							
30		Totals		###	###	###	###
31		Averages		###.0	###.0	###.0	###.0
32							
33							
34		Team 1 Totals		###	###	###	###
35		Team 1 Averages		###.0	###.0	###.0	###.0
36							

Figure 42 SuperCalc Assignment #2

Create the above spreadsheet.

NOTES:

1. Formulas should be used in all italicized cells or cells which contain pound (#) signs.
2. A user-defined format is necessary for the Average line.
3. Watch the text alignment. Some of the text is left justified and some of it is right justified.
4. In A34 type:
Team 1 Totals<enter>
The text will carry over into the next column. Same thing applies to A35.
5. Print the entire spreadsheet.
25 Points.

ASSIGNMENT #3

Create the table contained on the next page.

NOTES:

1. All italicized numbers are formulas. You should therefore use formulas on ALL total and quarter total lines.
2. You cannot get the lines to appear in between columns or rows with Supercalc 4. You must therefore make your spreadsheet appear as close to the supplied spreadsheet as possible.
3. You must use two user defined formats. One has floating dollar signs, embedded commas and 0 decimal places. The other format has only embedded commas and 0 decimal places.
4. Print the entire spreadsheet and hand this printout in. (10)
5. Make the following changes and print the entire spreadsheet. (15)
 - ▲ Change the January "Hourly" value for Fred's Bottling from 12,500 to 12,700.
 - ▲ Change the March, April and May "Utilities" values for Fred's Gifts from 900 to 850.
 - ▲ Change the January through June "Equip Purch" value for Fred's Clothing from 650 to 780.

Fred's Businesses
'91 Budget, First 2 Quarters

		Jan	Feb	Mar	Apr	May	Jun
Fred's Bottling							
	Utilities	\$1,500	\$1,400	\$1,400	\$1,300	\$1,400	\$1,400
	Salary	7,500	7,500	7,500	7,500	7,500	7,500
	Hourly	12,500	11,500	11,500	11,000	11,500	11,500
	Equip Purch	750	750	750	750	750	750
Totals		22,250	21,150	21,150	20,550	21,150	21,150
Quarter Totals				64,550			62,850
Fred's Gifts							
	Rent	\$1,200	\$1,200	\$1,200	\$1,200	\$1,200	\$1,200
	Utilities	1,100	1,000	900	900	900	900
	Salary	2,500	2,500	2,500	2,500	2,500	2,500
	Hourly	5,400	5,200	4,900	4,900	4,900	4,900
	Equip Purch	500	500	500	500	500	500
Totals		10,700	10,400	10,000	10,000	10,000	10,000
Quarter Totals				31,100			30,000
Fred's Clothing							
	Utilities	\$1,100	\$1,100	\$1,000	\$900	\$900	\$900
	Salary	1,100	1,100	1,100	1,100	1,100	1,100
	Hourly	5,400	5,400	5,200	5,100	5,000	5,000
	Equip Purch	650	650	650	650	650	650
Totals		8,250	8,250	7,950	7,750	7,650	7,650
Quarter Totals				24,450			23,050
Totals		\$41,200	\$39,800	\$39,100	\$38,300	\$38,800	\$38,800
Quarter Totals				120,100			115,900

ASSIGNMENT #4

	A	B	C	D	F	G	H	I
1	Work							
2		Hourly Wage		\$5.35				
3		Hours/Week		40				
4		Tax Rate		30.0%				
5								
6		Total before taxes		\$###.##				
7		Total after taxes		\$###.##				
8	Expenses							
9		Food budget		\$56.75				
10		Gas budget		12.50				
11		Other		15.00				
12		Entertainment		20.00				
13								
14		Remaining		##.##	Total after taxes and expenses.			
15								
16	Computer System Desired							
17		Computer		VIP 200 AT Compatible		\$600.00		
18		Hard Drive		Seagate 4096 - 80 meg		550.00		
19		Video Controller		Paradise Professional		400.00		
20		Monitor		Seiko CM-1430		550.00		
21		Memory		1 Meg		400.00		
22		Printer		HP DeskJet		700.00		
23		Printer Carts.		22706E & 22706 B		110.00		
24		Add on stuff		Serial/Parallel/1.4meg/1.2meg		200.00		
25		Software		WordPerfect		125.00		
26				SuperCalc 4		195.00		
27				Turbo Professional kit		150.00		
28		Other Stuff		Mouse pad		6.00		
29				Mouse		40.00		
30				Disks		30.00		
31								
32		Total Damage				\$#,###.##		
33								
34		Maximum Monthly Payment				\$###.##		
35		Remaining * 4 weeks/month						
36								
37	Loan Data							
38		Principle				\$#,###.##		
39		Interest				11.0%		
40		Payments				\$###.##		
41								
42		Number of months to pay off loan				##.##		

Figure 43 SuperCalc Assignment #4

Create the assignment contained in Figure 43.

NOTES:

- a. Column E is 2 characters wide. Column H is 10 characters wide.
- b. Use formulas wherever a cell is italicized or pound (#) signs are used.

- c. This assignment uses two user-defined formats.

The first user-defined format is used wherever there is a percentage.

The second format is used wherever there is a \$. Use user define format 2 for this format. You will not need to change user defined format 2 as all user-defined formats have dollar signs, two decimal places and commas by default.

- d. Use repeating text in cell H31 (the line of equal signs (=)).
- e. Type(That is, apostrophe, space, period.) in cell C32:
,
- f. Use the ANTERM formula (page 121) for cell H42. The exact formula is:
ANTERM(H40,H39/12,H38)<enter>
- g. Let the text carry over in cells B2, B3, B6, B7 and anywhere else it carries over.
- h. Use this spreadsheet to compute the number of hours/week you would have to work to pay off the loan in 24, 42 and 48 months. (5)

To do this, make changes to the Hours/Week (cell D3) entry until the desired number of months to pay off the loan is found.

- i. Use this spreadsheet to compute the hourly wage you would have to earn to pay off the load in 24, 42 and 48 months. See previous step for help. (5)
- j. Write the answers to steps h and i on the printout of the entire spreadsheet.

HAND IN: One printout of the entire spreadsheet & the answers to steps h and i.

30 Points.

Chapter 13 -- Data Base Concepts

PURPOSE: The purpose of this chapter is to introduce the student to the terminology and concepts associated with data base usage.

Data bases are used to accumulate data. Examples include:

Membership List

The data base keeps track of the current members, their addresses and when they owe dues.

Card Catalog

A library may have all of their books on computer. The card catalogs are in fact a large data base.

Bank Records

The bank keeps records on all of its customers. All transactions, monthly balances, overdrafts and so on, are kept for the safety of the bank and the convenience of the customer.

Developing a data base requires a few basic steps.

NEED The need must be defined. Which information is important, and which information is not important.

Consider a club membership. Is it necessary to have husband and wife specified together or are they separate members? Is the area code for members important or is it a local group and are all phone numbers local?

HOW How long is it necessary to keep the information? This will be important to know to give an idea of the amount of storage needed and may determine the type of computer to use.

How often will it be used and updated. If it will not be used every day, then maybe a member can keep track of all the information on a home computer. If the data base is updated daily and by numerous people it might be necessary to use an office computer or even dedicate a computer to the data base.

How will one work with the information? If we want to sort the mailing labels by ZIP code (for bulk mailing) then it will be necessary to store the ZIP code separately from the address. Will we be dealing with individual

states? If so, the state will also have to be separated from the mailing address. The key idea here is HOW individual pieces of information will be worked with.

WHAT	What type of information will be worked with? Is it numerical or textual.
HOW	How big is the information? Do we have names that are 40 characters long or just 20?

We will be discussing Guido's Loan Shark Company for the remainder of this discussion.

Guido has discovered that his accountants are falling behind due to the unusual growth of his business. He has decided to set up a data base to keep track of all of his customers.

What is the need? To keep track of a list of people. We will need their address, phone numbers, amount owed, when they borrowed the money and when the money is due.

How long is it necessary to keep track of this information? Most likely Guido is a patient person and as such gives his clients at least one month to pay back the loan.

How often will this data base be used? Probably daily due to its size. Guido is going to purchase a dedicated machine.

How will the information be manipulated? Will sorting by ZIP code be necessary? Guido is very cost conscious and will do bulk mailing whenever possible. Since zip codes are grouped together to do bulk mailing, the ZIP code will need to be stored separately. Guido also likes to see "his people" alphabetized by last name. This means that the name of the person will have to be broken up into First name, Last name and, to be formal, a title.

Guido services the entire midwest so phone numbers will need to have area codes.

Guido also gives all clients a second chance. If a client is overdue, Guido has one of their knees broken. Guido will need to keep track of whether a client's knee has or has not been broken.

We have so far:

First Name, last Name, Title (Mr., Ms., Dr.), Street Address, City, State, Zip Code, Area Code, Phone Number, Loan Amount, Loan Date and whether or not the client has a broken knee.

Guido has decided that this is the necessary information maintain.

Next he must decide the type of information. Guido has decided to use dBase which has the following data types:

Character	Same as before. See Textual Data (page 118) and below.	
Numeric	Same as before. See Numerical Data (page 117) and below.	
Date	This data type holds dates.	
Logical	This data type is either true or false.	
Memo	This data type is like character but can hold more information.	

Guido made the following decisions about the data types and sizes.

First name	Character	13	
Last name	Character	16	
Title	Character	6	
Street Address	Character	30	
City	Character	13	
State	Character	2	
Zip Code	Character	5	(No math involved)
Area Code	Character	3	
Phone Number	Character	8	(xxx-yyyy)
Loan Amount	Numeric	8	2 decimal places
Loan Date	Date	8	All dates are 8 long.
Broken Knee	Logical	1	All logical fields are 1 long.

With all of this information, Guido has decided that the data base preliminary development is complete.

DATA BASE CONCEPTS

ACTIVE(CURRENT) RECORD

The active record is like the default drive. It is the record that dBase will work with unless told otherwise. The active record is set by using the GOTO command³⁰.

CHARACTER

An individual letter, number or symbol. This line contains 73 characters.

³⁰The goto command is covered in the next chapter.

DATA BASE

The data base is a collection of records. All the records in a data base make up that data base.

DATA BASE FILE

A data base file is a data base that has been stored on some media.

FIELD

A field is an individual piece of information. In the development of Guido's data base, there are 11 fields: first name, last name ...

FIELD NAME

In dBase each field needs to have a field name. A field name must start with a character and must be no more than 10 characters in length. From the above fields, the following field names could be used:

FName, LName, Title, StrAddr, City, State, Zip, AC, PhoneNum, LoanAmt,
LoanDate, BK.

Notice that no spaces are used. dBase will not allow spaces in field names.

FIELD SIZE

The field size refers to the maximum number of characters or numbers available for storage.

In Guido's data base the field sizes are: first name 13, last name 16 ...

FIELD TYPE

dBase has five field types: Character, Numeric, Date, Logical and Memo. The field type is just the type of information being stored.

NUMERIC DATA

Same as before. See page 117.

RECORD/ENTITY/OBJECT

A record is a collection of fields that make up one complete set of information about something. In the case of Guido's loan shark business the record is a collection of 11 fields.

The record gives all the known and important information about some THING or object.

STRUCTURE

The structure of a data base is the list of fields, the field names, field sizes and field types that make up a record. In a given data base, the structure for each record is the same.

TEXTUAL DATA

Same as before. See page 118.

Let's look at the original bowling spreadsheet:

Ignore the average and total rows and the column headers (name, game 1, ...). The name and a person's bowling scores are all that is left over.

This is a valid data base. The fields are:

First name, Score for game 1, Score for game 2, score for game 3 and the three game total.

	A	B	C	D	E
1	Name	Game 1	Game 2	Game 3	Totals
2	Brett	156	198	176	530
3	Bart	174	169	169	512
4	Nancy	134	125	120	379
5	Carmie	120	100	145	365
6	Cathy	176	201	198	575
7	John	24	31	14	69
8	Totals	784	824	822	2430
9	Average	131	137	137	405
10					
11					
12					

Figure 44 Bowling Spreadsheet

A record is a collection of the above fields.

The data base is the collection of names from Brett to John.

The structure of the data base might be:

fname	character	6
game1	numeric	3
game2	numeric	3
game3	numeric	3
total	numeric	3

Notice the correlation between rows of a spreadsheet and a record in a data base; and between columns of a spreadsheet and a field in a data base. This is no accident. Conceptually the spreadsheet and data base share many such relationships. When developing a data base keep this relationship in mind. It may help to organize your thoughts.

ASSIGNMENTS

1. Give three uses of a data base. (15)
2. Define the fields necessary for each of the above three data bases. (6)
3. Define valid field names for the fields created in step 2. Note that this and step 2 are VERY similar. (3)
4. Define the field types for the fields created in step 2. (6)
5. Given the following data base, define the field names, types and sizes. (10)

Group	Album Title	Medium	Number Discs	Cost	Pub	Year	Type
Guns N' Roses	Appetite For Destruction	cd	1	12.34	1987	Rock	
Warren Zevon	A Quiet Normal Life/Best of	cd	1	14.99	1986	Rock	
R.E.M.	Murmur	cd	1	12.34	1981	Rock	
R.E.M.	Reckoning	cd	1	12.34	1984	Rock	
R.E.M.	Green	cd	1	11.99	1988	Rock	
R.E.M.	Dead Letter Office	cd	1	15.99	1987	Rock/CW	
R.E.M.	Document	cd	1	12.99	1987	Rock	
R.E.M.	Eponymous	cd	1	13.99	1988	Rock	
R.E.M.	Fables of the Reconstruction	cd	1	13.99	1985	Rock	
INXS	Shabooh Shoobah	cd	1	10.99	1982	Alternative	
Sting	Nothing Like the Sun	cd	1	13.99	1987	Jazz/Rock	
The Police	Regatta de Blanc	cd	1	11.99	1978	Rock	
Underworld	Underneath the Radar	cd	1	12.99	1988	New Wave	
Warren Zevon	Sentimental Hygiene	cd	1	12.34	1987	Alternative	
Otto Klemperer	Mozart, The Magic Flute	cd	1	8.99	1987	Classical	
The Call	Into The Woods	cd	1	12.99	1987	New Wave	
The Call	Reconciled	cd	1	12.34	1986	New Wave	
Academy of St. Martin...	Amadeus	cd	2	24.99	1984	Classical	
The Cult	Love	cd	1	12.99	1985	Cult Rock	
The Police	Synchronicity	cd	1	9.99	1983	Jazz/Rock	
New Order	Substance	cd	2	12.99	1984	Dance/New Wave	
The Police	Ghost in the Machine	cd	1	12.99	1981	Rock	
The Cult	Electric	cd	1	12.99	1987	Cult Rock	
The Cult	Dreamtime	cd	1	15.99	1984	Cult Rock	

Figure 45 Data for Music Data Base

Chapter 14 -- dBase Command Reference

Using dBase is like using DOS. A command, followed by parameters is typed. dBase takes the command and parses³¹ it, and some action is performed. The main difference between dBase and DOS is that first, dBase only understands dBase commands and second, dBase uses a dot(.) prompt instead of A> or B>. The dot prompt is a sure sign that dBase is currently running.

The following is a partial list of commands for dBase.

COMMAND LIST

				Bytes remaining: 4000			
CURSOR <-- -->		INSERT		DELETE		Up a field: ↑ Down a field: ↓ Exit/Save: ^End Abort: Esc	
Char:	←→	Char:	Ins	Char:	Del	Word:	^Y
Word:	Home End	Field:	^N	Field:	^U	Field:	^U
Pan:	^ ^	Help:	F1				
Field Name	Type	Width	Dec	Field Name	Type	Width	Dec
1	Character	10	2				
CREATE <B:> GUIDO Field: 1/1							
Enter the field name. Field names begin with a letter and may contain letters, digits and underscores							

Figure 46 Creating a Structure

³¹Parse means to take apart. In this case the command is broken down into individual words and dBase interprets the command.

CREATE

The create command allows a data base to be created. If there is a data base in the computer's memory when this command is issued, that data base will be saved to disk. The syntax of the command is:

CREATE<filename><enter>

Once this command has been typed, the screen will clear and a new screen will replace it. The following screen is close but not exact.

				Bytes remaining: 3887			
CURSOR <-- --> Char: ←→ Word: Home End Pan: ^ ^		INSERT Char: Ins Field: ^N Help: F1		DELETE Char: Del Word: ^Y Field: ^U		Up a field: Down a field: Exit/Save: ^End Abort: Esc	
<hr/>				<hr/>			
Field	Name	Type	Width	Dec	Field	Name	Type
1	FNAME	Character	13		9	PHONENUM	Character
2	LNAME	Character	16		10	LOANAMT	Numeric
3	TITLE	Character	6		11	LOANDATE	Date
4	STRADDR	Character	30		12	BK	Logical
5	CITY	Character	13		13	[REDACTED]	Character
6	STATE	Character	2				
7	ZIP	Character	5				
8	AC	Character	3				
CREATE <B:> GUIDO Field: 13/13				Enter the field name. Field names begin with a letter and may contain letters, digits and underscores			

Figure 47 Structure Entered

This screen is organized in the same way Guido organized the structure of his data base. The field name, type and sizes are listed in the same order. (See page 167.)

The Field Name is entered under the Field Name column. Type C for character, N for numeric, D for date, M for memo or L for logical under the Type column.

The width of a given field is entered under the Width column.

Enter the decimal places for numeric fields under the Dec column.

The highlighted bars shows the maximum size of anything being typed. Make an entry and press <enter> to get to the next box. (Except in the case of entering field types where dBase will move on after a letter has been typed.)

When the structure of the data base has been entered, the screen will look similar to the above figure.

In the next chapter, instructions will be given for entering this information.

Once the data base structure has been entered with the create command, use Ctrl-<End> to tell dBase you are finished with this screen. dBase will ask you to confirm the Ctrl-<End> by pressing <enter>. Next, the question "Input data records now? (Y/N)" will be displayed. Type Y for yes or N for no. If N is typed, dBase will return to the dot(.) prompt.

If Y is typed, the screen will clear and a new screen will be displayed. See below.

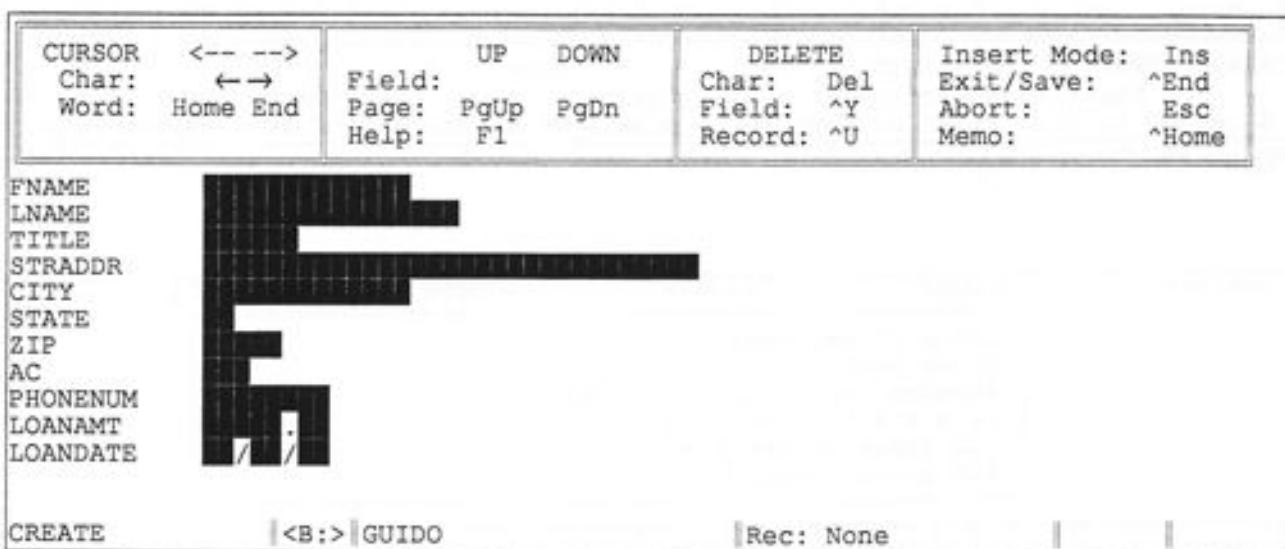


Figure 48 Enter a Record

After the structure has been defined, dBase will ask if data records should be entered.

The create command can also be used to create report formats.

A report format is a columnar output, like a spreadsheet, with page numbers, a date and column headings.

The syntax is:

CREATE REPORT <filename> <enter>

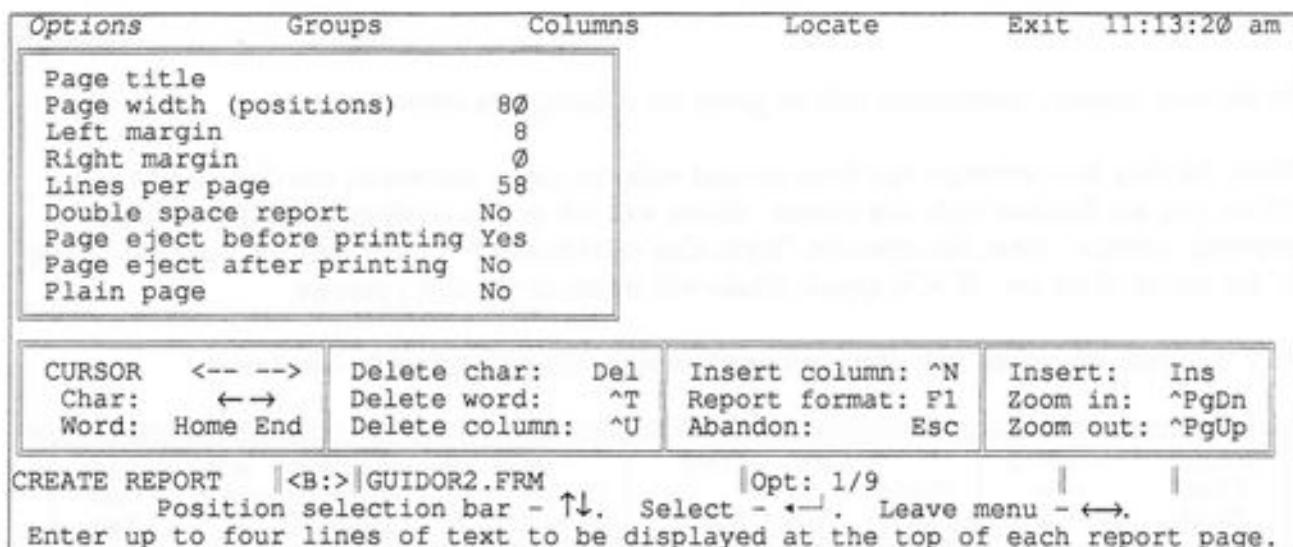


Figure 49 Create a Report Format

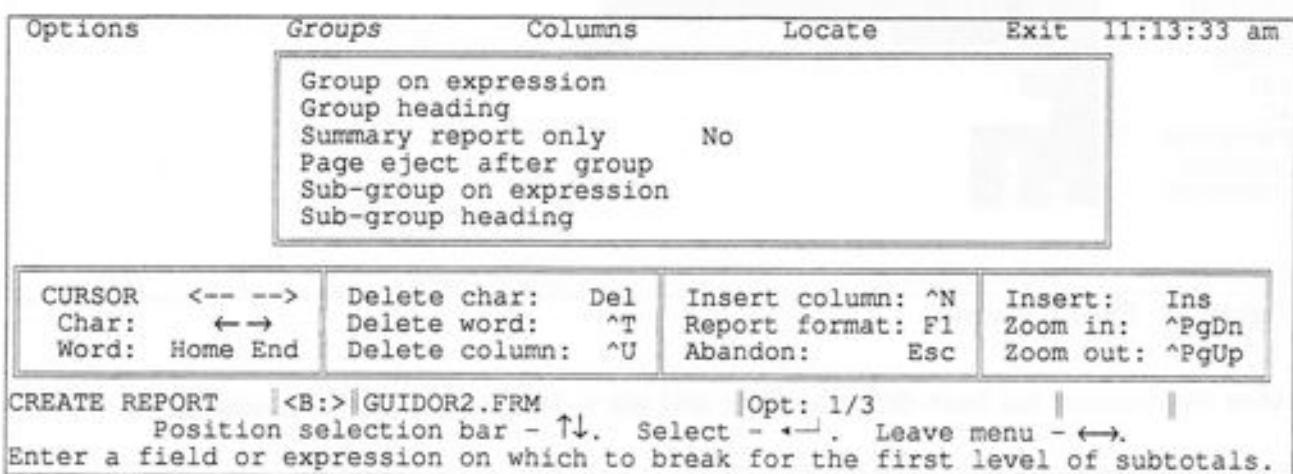


Figure 50 Group Sub-Menu

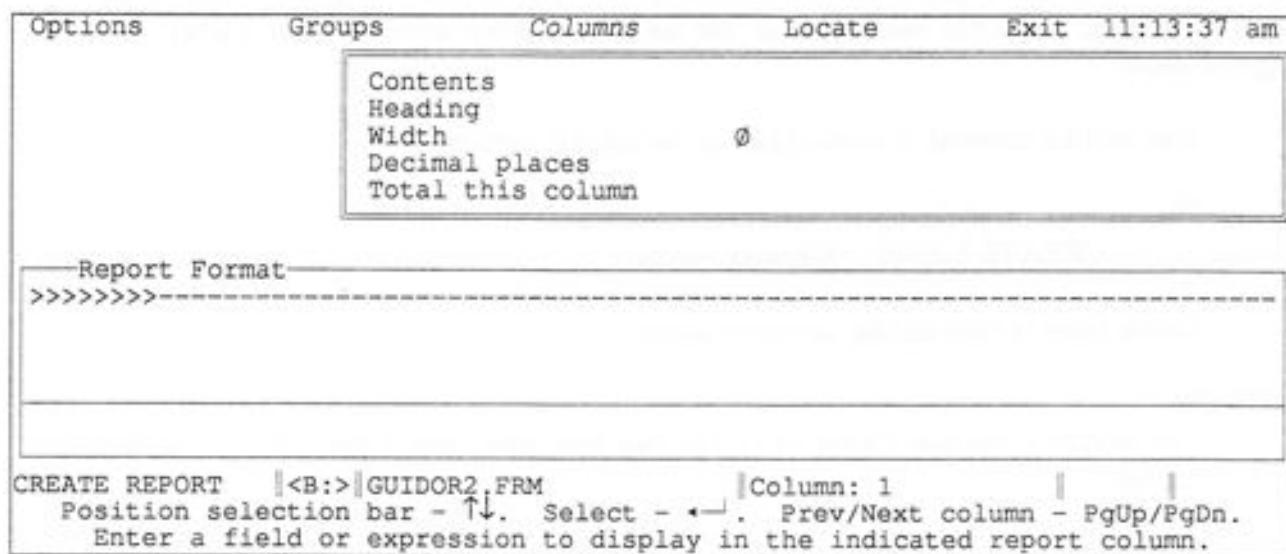


Figure 51 Column Sub-Menu

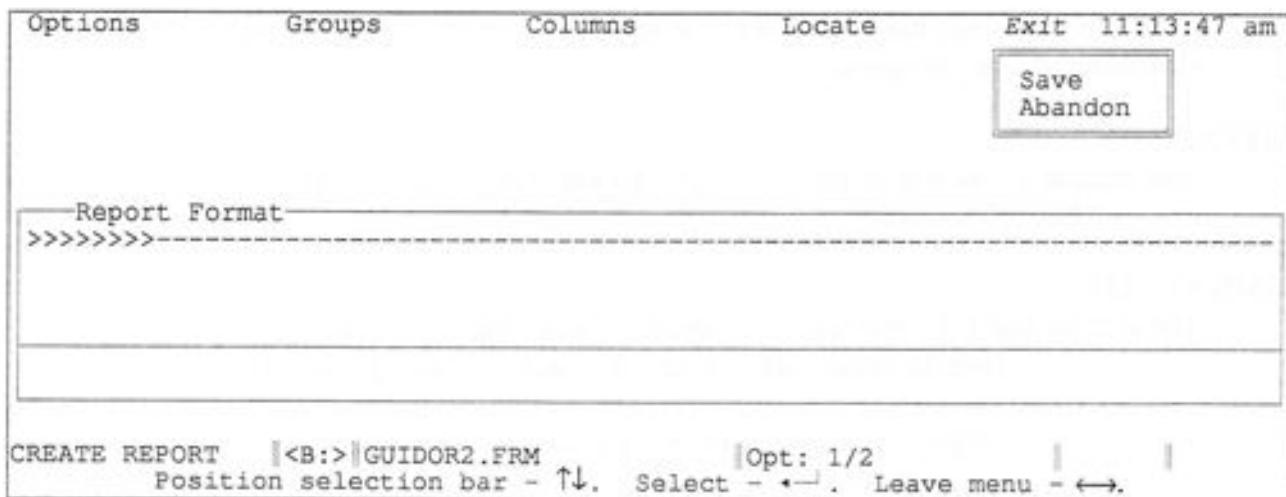


Figure 52 Exit Sub-menu

This command requires that a data base be in memory. If one is not, dBase will prompt the user for a data base file name.

After the command has been entered, the screen will clear and a new menu system will be available. The menu options are: Options, Groups, Columns, Locate and Exit.

The right and left cursor keys will move between the Options, Groups, Columns, Locate and Exit menus. The first letter of the five selections may also be typed to directly select a menu. Once the desired menu has been selected, use the up and down arrow to make a selection under a given menu.

This will be covered in more detail in the tutorial section.

The last option of the create command covered is:

CREATE LABEL <filename><enter>

Create label is very similar to create report.

MODIFY

The modify command allows editing of data base structures, report formats and label formats.

Syntax:

MODIFY REPORT <FileName><enter>
MODIFY LABEL <FileName><enter>
MODIFY STRUCTURE<enter>

After this command has been typed, the screens for creating reports, labels or data base structures will be displayed.

APPEND

Add records to the end of the data base. To use this command, type:
APPEND<enter>

DISPLAY/LIST

The display and list commands are similar. The primary differences are:

1. Display pauses after about 20 lines have been displayed, list does not.
2. Display requires the keyword ALL after it to display the entire data base, list does not.

Display is generally used for displaying information only to the screen while list is generally used for displaying information to the printer.

Display will be covered, but the same information holds for list.

Syntax:

DISPLAY[<scope>][<expression list>][FOR<condition>][OFF]
[TO PRINT]

<Scope> refers to how much of the data base should be worked with. The scope can be any of the following:

- | | |
|--------------|---|
| All | The entire data base. |
| Next<number> | The next <number> of records will be displayed. |

<Expression List> refers to which fields should be displayed. If an expression list is not specified, all fields will be displayed. The expression list can include formulas. For example, if one of the fields is HourlyWage, HourlyWage * 40 can be entered in the expression list.

FOR <condition> allows the user to specify conditions that must be satisfied for the record to be displayed. The for condition is used to compare the value in a field to a user specified value. Numeric values are entered as usual, character fields are entered with quotation marks, logic fields can be entered by themselves. The DTOC³² function must be used with date fields and memo fields cannot be used.

Multiple conditions can be strung together with .AND. and/or .OR. and conditions can be reversed or negated with .NOT.

The [Off] option is used to turn off the displaying of record numbers.

[To Print] will send the output to the printer. (And the screen)

Assume the following data for the upcoming examples:

Brett Schuchert	inst.	Wouldn't you like to know	Iowa City	IA 52240	319 351-5702	1000.00	01/04/88	.F.
Shawn Olson	Inst.	30 S. Johnson, Apt 4	Iowa City	IA 52240	319 351-6621	300.00	12/16/88	.F.
Mary Farlithen	Ms.	Main street	Chicago	IL 60602	312 653-7643	1200.00	12/01/88	.F.
Charles Bergdon	Inst.	1200 W. Benton	Iowa City	IA 52240	319 337-4666	13000.00	11/01/88	.T.
Linda Johnson	Dr.	1132 Bloomington	Minneapolis	MN 55402	612 552-1254	1200.00	12/14/88	.F.
Nancy Larkin		3342 E. 12th Street	St. Louis	MO 44531	612 344-4321	300.00	11/01/89	.F.
Fred Harrison	Sr.	312 12th Street	Minneapolis	MN 55402	612 344-4321	2300.00	01/06/89	.F.
Larry Targeniz		2213 12th Street	Downers Grove	IL 55332	312 377-8871	5000.00	12/09/88	.T.

³²This function converts a date to a string. DTOC(duedate) can be compared to "05/02/92", for example.

Examples:

<Scope> = all
<Expression List> = Fname, Lname

Notice that the word "off" at the end of the command.
It causes the record numbers to NOT be displayed.
Contract this with the next figure.

```
. Display ALL Fname, Lname off
Fname      Lname
Brett      Schuchert
Shawn      Olson
Mary       Farlthon
Charles    Bargdon
Linda      Johnson
Nancy      Larkin
Fred       Harrison
Larry      Targeniz
```

Figure 53

<Scope> = all
<Expression List> = Fname, Lname

In this case the word "off" is not used. We get record numbers in this printout.

```
. Display ALL fname, lname
Record#  fname      lname
1   Brett      Schuchert
2   Shawn      Olson
3   Mary       Farlthon
4   Charles    Bargdon
5   Linda      Johnson
6   Nancy      Larkin
7   Fred       Harrison
8   Larry      Targeniz
```

Figure 54

<condition> = .NOT. BK

<Scope> =

Due to the <condition>,
<Scope> is all items that fit the
condition.

<expression list> =
 fname, lname, state

```
. Display Fname, Lname, State FOR .not. BK
Record#  Fname      lname      state
1   Brett      Schuchert    IA
2   Shawn      Olson       IA
3   Mary       Farlthon     IL
5   Linda      Johnson     MN
6   Nancy      Larkin      MO
7   Fred       Harrison    MN
```

Figure 55

Notice that only 6 records are displayed. The records for which the BK field are false (.F.) are displayed. Records 4 and 6 are skipped over because the BK field is true(.T.).

Whenever a FOR condition is used, there MUST be at least 1 field name. The for condition reduces everything to either true or false. If the final result is false the record will not be displayed, if the result is true the record will be displayed.

```
. Display fname, State, phonenum for STATE = "IA"
Record#  fname          State phonenum
        1  Brett           IA   351-5702
        2  Shawn           IA   351-6621
        4  Charles          IA   337-4666
```

Figure 56

<condition> = FOR STATE = "IA"
 <Expression List> = fname, State, phonenum

Notice that only 3 records are displayed. This time the for condition retrieved all people who live in Iowa. State is a character field so quotation marks are placed around the value to be searched for. i.e. "IA". Also, when matching character fields, the case of the letters must be the same. i.e. IA does not equal ia.

```
. display fname, state, phonenum for loanamt > 1000
Record#  fname          state phonenum
        3  Mary            IL   653-7643
        4  Charles          IA   337-4666
        5  Linda            MN   552-1254
        7  Fred             MN   344-4321
        8  Larry            IL   377-8871
```

Figure 57

<condition> = for loanamt > 1000
 <Expression List> = fname, state, phonenum

COMPARISON/LOGIC SYMBOLS

The following comparison symbols can be used for comparisons:

=	equal to
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
<>	not equal to

Brett's loan amount is 10000 and is not displayed. For Brett to be included in the list, the > would have to be changed to >=.

Finally notice that the dollar amount is not quoted. Numeric fields cannot be compared to something with quotation marks around it.

```
. display fname,loandate for loanamt >=5000 .and. state = "IA"
Record#    fname          loandate
        4   Charles       11/01/88
```

Figure 58

```
<condition> = for loanamt >= 5000 .and. state = "IA"
<Expression List> = fname, loandate
```

This is the first condition with two parts. The first part is Loanamt ≥ 5000 and the second part is state = "IA". These two parts are connected together with the .AND. clause which means that BOTH conditions must be satisfied for the record to be displayed. Charles is the only person to match these conditions.

Every time there is a FOR, there will be at least one field name. An additional field name is necessary for each additional .AND. or .OR. used.

DISPLAY STRUCTURE

The Display structure command will display the structure of the current data base along with size of each record, the last time the data base was updated and the file name.

GOTO

The goto command allows the user to set the current record.

The current record is the record last modified or displayed. If the data base has just been loaded, the current record is number 1.

Examples:

GOTO 4<enter>

Record 4 becomes the active record.

```
. display structure
Structure for database: C:guido.dbf
Number of data records: 8
Date of last update : 01/15/88
Field Field Name Type Width Dec
 1 FNAME Character 13
 2 LNAME Character 16
 3 TITLE Character 6
 4 STRADDR Character 30
 5 CITY Character 13
 6 STATE Character 2
 7 ZIP Character 5
 8 AC Character 3
 9 PHONENUM Character 8
10 LOANAMT Numeric 8      2
11 LOANDATE Date 8
12 BK Logical 1
** Total **           114
```

Figure 59 A Structure Displayed

REPORT/LABEL FORM

The report/label form command USES an already created report or label format.
REPORT FORM <filename> [FOR<condition>][TO PRINT]

The [to print] and [for condition] are the same as previously mentioned.

LABEL FORM <filename> [FOR<condition>][TO PRINT]

This command parallels the report form command.

DELETE

Delete marks a record for deletion. A deleted record will have an * by it when displayed.

Delete by itself will delete the current record.

Delete Record 4<enter>

Will mark record 4 for deletion.

PACK

Pack removes records from the data base that have been marked for deletion by the delete command. This command is not reversible.

PACK<enter>

RECALL

Recall will unmark a record that has been marked for deletion. It cannot recover records after the pack command has been used.

Recall Record 4<enter>

Will recall record 4 if it was deleted and not packed.

INSERT

Inserts a record in to the data base.

Insert will allow a record to be inserted after or before the current record.

INSERT[BEFORE]

Insert<enter>

Will insert a blank record AFTER the current record. (See page 167.)

Insert before<enter>

Will insert a blank record BEFORE the current record.

EDIT

The edit command allows a record to be modified.

Edit<enter>

Will edit the current record.

Edit record 6<enter>

Will edit record 6.

SORT

Sort makes a sorted copy of the current data base in either numerical or alphabetical order.

This command does NOT sort the current data base but rather creates a new data base in a file that is user specified.

SORT TO <filename> on <Field1>[/A][/]D[/C] [,<Field2> [/A][/]D[/C]] ...

[/A] sort ascending, low to high.

[/D] sort descending high to low.

[/C] treat capital and lower case letters as the same.

Examples:

Sort to Guidosrt on lname /C <enter>

This will create a new data base called Guidosrt with the records sorted by last name. The new order will be:

Charles	Bargdon	Inst.	1200 W. Benton	Iowa City	IA	52240	319	337-4666	13000.00	11/01/88	.T.
Mary	Farithon	Ms.	Main street	Chicago	IL	66402	312	653-7643	1200.00	12/01/88	.F.
Fred	Harrison	Sr.	312 12th Street	Minneapolis	MN	55402	612	344-4321	2300.00	01/06/89	.F.
Linda	Johnson	Dr.	1132 Bloomington	Minneapolis	MN	55402	612	552-1254	1200.00	12/14/88	.F.
Nancy	Larkin		3342 E. 12th Street	St. Louis	MO	44531	612	344-4321	300.00	11/01/89	.F.
Shawn	Olson	Inst.	30 S. Johnson, Apt 4	Iowa City	IA	52240	319	351-6621	300.00	12/16/88	.F.
Brett	Schuchert	Inst.	Wouldn't you like	Iowa City	IA	52240	319	351-5702	1000.00	01/04/88	.F.
Larry	Targenix		2213 12th Street	Downers Grove	IL	55332	312	377-8871	5000.00	12/09/88	.T.

Figure 60 First Sorting

Note that this figure is slightly incomplete due to margin constraints. See page 177.

Sort to Guido2 on loanamt<enter>

This will create a new data base called Guido2 sorted numerically on the loan amount.

Shawn	Olson	Inst.	30 S. Johnson	Iowa City	IA	52240	319	351-6621	300.00	12/16/88	.F.
Nancy	Larkin		3342 E. 12th Street	St. Louis	MO	44531	612	344-4321	300.00	11/01/89	.F.
Brett	Schuchert	Inst.	Wouldn't you like	Iowa City	IA	52240	319	351-5702	1000.00	01/04/88	.F.
Mary	Farithon	Ms.	Main street	Chicago	IL	66402	312	653-7643	1200.00	12/01/88	.F.
Linda	Johnson	Dr.	1132 Bloomington	Minneapolis	MN	55402	612	552-1254	1200.00	12/14/88	.F.
Fred	Harrison	Sr.	312 12th Street	Minneapolis	MN	55402	612	344-4321	2300.00	01/06/89	.F.
Larry	Targenix		2213 12th Street	Downers Grove	IL	55332	312	377-8871	5000.00	12/09/88	.T.
Charles	Bargdon	Inst.	1200 W. Benton	Iowa City	IA	52240	319	337-4666	13000.00	11/01/88	.T.

Figure 61 Second Sorting

The new order will be:

Sort on state/C, lname/C to guido3

This creates a data base sorted first by state (all people from the same state are grouped together) and then sort all the people from the same state by last name. The result is:

To actually see the result of the sort command, the USE command must be executed.

Charles Bargdon	Inst.	1200 W. Benton	Iowa City	IA 52240	319 337-4666	13000.00	11/01/88	.T.
Shawn Olson	Inst.	38 S. Johnson	Iowa City	IA 52240	319 351-6621	300.00	12/16/88	.F.
Brett Schuchert	Inst.	Wouldn't you like	Iowa City	IA 52240	319 351-5702	1000.00	01/04/88	.F.
Mary Farlton	Ms.	Main street	Chicago	IL 60602	312 633-7643	1200.00	12/01/88	.F.
Larry Targenitz		2213 12th Street	Downers Grove	IL 55332	312 377-8871	3000.00	12/09/88	.T.
Fred Harrison	Sr.	312 12th Street	Minneapolis	MN 55402	612 344-4321	2300.00	01/06/89	.F.
Linda Johnson	Dr.	1132 Bloomington	Minneapolis	MN 55402	612 552-1254	1200.00	12/14/88	.F.
Nancy Larkin		3342 E. 12th Street	St. Louis	MO 44531	612 344-4321	300.00	11/01/89	.F.

Figure 62 Third Sorting

USE

Open a data base to be worked with.

USE<filename><enter>

To see the results of the above sort commands, the following commands could be used.

USE Guido3<enter>	Open the data base.
DISPLAY ALL<enter>	Display the data base.
USE Guido2<enter>	Open a new data base.
DISPLAY ALL<enter>	Display the current data base.
USE Guidosrt<enter>	Open the third data base.
DISPLAY ALL<enter>	Display the current data base.

The above six commands load the data bases, created with the sort command, into memory and displays them.

Remember, sorting a data base creates a DIFFERENT data base file. The new data base file has the same structure and data but the data is in a different order.

The USE command is required to see the results of the sort command.

To see the results of a sort command, follow these steps:

1. Create the sort file with the SORT command.
2. Use the USE command to activate the sort file.
3. List the sort file.

ASSIGNMENTS

1. List the command(s) necessary to retrieve a data base called GUIDO.
2. List the command(s) necessary to print all information in the data base to the printer.
3. List the command(s) necessary to retrieve and print all data in the data base called INVENTORY.
4. List the command(s) necessary to save the current data base and quit from dBase.

(10 points total)

Chapter 14a -- dBase Command Reference

The current dBase Command Reference chapter is under repair. This chapter is included to clarify parts of that chapter. Eventually, this chapter will replace the current chapter 14 in its entirety.

Many commands listed here are not strictly separate. For example, *create* and *create report* are variations of the *create* command. However, treating each version of the *create* command separately will ease the discussion.

Simple examples are included for some of the commands while more complex examples are reserved for the end of this chapter.

APPEND

The append command is used to add records to an existing data base. With a data base in memory, just type *append<enter>* at the dot prompt.

EXAMPLE: *.append<enter>*

CREATE

The *create* command is used to create new data bases. The syntax of the command is:
create <filename><enter>

If a data base is already in memory when the *create* command is used, the old data base will be closed and all of its data saved.

You cannot use the *create* command with an already open data base. For example, if the data base "foo" is currently open, you cannot issue the command *create foo<enter>*.

Finally, if you attempt to use the name of an already existing data base, dBase will ask you to confirm that you wish to remove the old file and create a new file.

EXAMPLE: *.create guido<enter>*

CREATE REPORT

The *create report* command is used to create new report formats. The syntax of the command is:

create report <filename><enter>

Report formats allow the user to display information from the data base with automatic pagination, page numbers and the current date. The user also selects what information will be contained in the report format by selecting fields from the data base or by combining fields to create new information. The user is also able to place a descriptive heading above each of the columns of the report.

If the *create report* command is used with an existing file, rather than overwrite the existing report format, the user is allowed to make changes to the report format.

The <filename> associated with the report format can be any valid <filename> but be thoughtful in your choice of file names. dBase does not keep any kind of record to associate a particular report format with a particular data base; it is up to the user to remember which report formats go with a particular data base.

EXAMPLE: *.create report gudirpt<enter>*

DELETE RECORD

The *delete record* command is used to mark records in the data base to be removed upon the next use of the *pack* command. The syntax of the command is:

delete record <n><enter>

Where <n> is a number from 1 to the number of records in the data base. If a record is deleted from the data base, an asterisk (*) will be displayed by the record when using the *list* command. The record is thus marked for deletion. To physically remove the record from the data base, the *pack* command must be used.

EXAMPLE: *.delete record 5<enter>*

MODIFY REPORT

The *modify report* command is used to make modifications to an existing report format. The syntax of the command is:

modify report <filename><enter>

Where <filename> is any valid file. After issuing this command, the user will be allowed to make changes to the report format.

EXAMPLE: *modify report gudirpt<enter>*

EDIT RECORD

The *edit record* command is used to make modifications to an existing record in the data base. The syntax of the command is:

edit record <n><enter>

Where *<n>* is a number from 1 to the number of records in the data base. When this command is issued, record *<n>* will be displayed on the screen, allowing the user to make modifications to the record. Once changes have been made, press *Ctrl-<End>* to save the changes.

If you wish to discard the changes, press *<Esc>*.

EXAMPLE: .edit record 5<enter>

INDEX

The *index* command is used to order the current data base based on a character value in one or more fields. If the field type is not character, it must be converted to a character field for the command. The syntax of the command is:

index on <value> to <filename>

Where *<value>* is some character expression and *<filename>* is a valid file name.

EXAMPLE: .index on lastname to gudiindx<enter>

INSERT RECORD

The *insert record* is used to insert a new record into the data base. By default, the *insert record* command will add a new record after the current record in, but the keyword *before* can be added to insert before the current record. The syntax of the command is:

insert record [before]<enter>

EXAMPLES: .insert record<enter>
.insert record before<enter>

LIST

The *list* command is used to retrieve information from the data base. The *list*³³ command has four parts:

list [list of fields] [for <something> <comparison> <something>] [to print]
1 2 3 4

- 1 The command itself. This part is mandatory.
- 2 A list of fields. This list of fields consists of fields in the data base separated by commas. You can also perform simple math on the fields. For example, consider the following data base:

<u>Field Name</u>	<u>Field Type</u>	<u>Field Size</u>	<u>Decimal Places</u>
Fname	Character	13	
Lname	Character	17	
YrIncome	Numeric	9	2
PhNum	Character	8	

A list of fields for the above data base could be any of the following:

Fname, Lname
Fname, YrIncome
Fname, YrIncome/52
Fname, PhNum, YrIncome*10

Notes:

You do NOT place a comma after the last field.
YrIncome/52 and YrIncome*10 will give the weekly pay and the total amount earned over 10 years, respectfully.

- 3 The *for* option of the *list* command is used to select specific records from the data base based on some condition or conditions. Definitions:

<something> is either a field name or a <constant>

<constant> is either a number or string constant in "quotes". Examples:

Fname	A character field
YrIncome	A numeric field
"Brett"	A string constant
12300.00	A numeric constant

³³This information applies to the *display* command also.

<comparison> is one of the following:

- > Greater than
- < Less than
- = Equal to
- >= Greater than or equal to
- <= Less than or equal to
- <> Not equal to

Possible uses of the *for* option of the *list* command include:

```
for fname = "Brett"  
for YrIncome > 12000  
for Lname <> "Smith"
```

The first option lists all records in the data base for which the first name of the person is equal to Brett

The second option lists all records in the data base for which the person's yearly income is greater than 12000.

The last option list all records in the data base for which the last name is NOT equal to Smith.

Notes:

You can add additional conditions by using .and. or .or. and putting another FULL condition after it. If you do this, the two conditions are typed such that either could stand alone. For example:

```
for fname = "Brett" .and. YrIncome > 10000
```

List all people whose first name is Brett and who make more than 10000 per year.

Note that the first condition is: fname = "Brett", and the other condition is: YrIncome > 10000, and that both of these conditions can stand alone as complete conditions.

Another example:

```
for fname = "Brett" .or. fname = "Laurie"
```

List for all people whose first name is either Brett or Laurie. Note here that the condition: fname = "Brett" and the condition: fname = "Laurie", are both complete comparisons and could stand alone.

Also note that since the first name field is used for both comparisons, it is typed twice.

- 4 The last option, *to print*, if typed, will cause the output to go both to the printer and the screen.

NOTES:

Do not type a comma after the last file in a list of fields.

You must use "" around string constants.

You cannot use "" around numeric constants.

Compare numeric fields to numeric constants or other numeric fields.

Compare character fields to character constants or other character fields.

EXAMPLES: At the end of the chapter.

MODIFY STRUCTURE

The *modify structure* command is used to change the structure of the current data base.
The syntax of the command is:

```
modify structure<enter>
```

After issuing this command, the user will be allowed to update any of the following:
field names, field sizes, field types.

If field names are changed, data may be lost, so avoid changing field names.

Changing field sizes may cause data to be lost if the field is made smaller. Making a field wider will not cause problems.

Changing field types is difficult and generally speaking, data is lost unless the field type is changed to character. Use this option with caution.

EXAMPLE: .modify structure<enter>

MODIFY SCREEN

The *modify screen* command is used to change the structure of a data entry screen. The syntax of the command is:

modify screen <filename>

Where *<filename>* is any valid file name.

<ADD LOTS OF STUFF HERE>

EXAMPLE: .modify screen gudiscrn<enter>

PACK

The *pack* command is used to remove records in the data base that have been marked for deletion. The syntax of the command is:

pack<enter>

Records that were marked for deletion are removed and cannot be recovered. If records are to be undeleted, use the *recall* command before issuing the *pack* command.

EXAMPLE: .pack<enter>

QUIT

The *quit* command is used to exit from dBase and save any open data bases. The syntax of the command is:

quit<enter>

EXAMPLE: .quit<enter>

RECALL RECORD

The *recall* command is used to undelete records from the data base. This command reversed the effect of the *delete record* command. The syntax of the command is:

recall record <n><enter>

Where *<n>* is any number from 1 to the number of records in the data base.

EXAMPLE: .recall record 5<enter>

REPLACE

The *replace* command is used to replace fields in the data base with new values based on some <scope> or <condition>. The syntax of the *replace* command is:

replace <scope> <field> with <expr>[,<field> with <expr> ...]

Where <scope> is any of the following:

- | | |
|---------------|----------------------------------|
| <i>all</i> | to include all records. |
| <i>next</i> | to include the next <n> records. |
| <i>record</i> | to include record <n>. |

<field> is any valid field in the current data base.

<expr> is some value to replace the field with. If the field is a numeric field, then the expression should be numeric in nature. If the field is a character field, the expression should be character in nature.

Notice that a comma can be appended to the command and additional fields can be modified.

One final note, the *for* keyword can be applied to this command and it has the same meaning as for the *list* command.

EXAMPLES: At the end of the chapter.

REPORT FORM

The *report form* command is used to apply an existing report format to the current data base. The syntax of the command is:

report form <filename>[to print]<enter>

Where <filename> is any filename.

Note that *to print* can be appended to the command to direct the output of the command to the printer.

Note also that the *for* keyword can be used with this command and it has the same effect as for the *list* command.

EXAMPLE: .report form gudirpt<enter>

SORT

The *sort* command is used to create a new data base that is a sorted, either alphabetically or numerically, version of the current data base. The syntax of the command is:

sort on <field>[/C][/A][/D][,<field> ...] to <filename>

Where <field> is any valid field name in the data base, and <filename> is a valid file name.

This command creates a new data base with the name <filename> that contains all the same information at the current data base but in a (possibly) different order.

/A can be appended to a field name to sort ascending (low values to high value) but this is the default behavior. /D can be appended to a field name to sort descending (high value to low). /C can be appended to character fields and causes dBase to treat lower case and upper case letters as equivalent.

Notice that a comma can be appended to the end of the command and additional fields can be added to sort on multiple fields. An example of where this might be useful is when sorting mailing labels where you want to sort data by zip code for bulk mailing and alphabetically by the last names for convenience.

To see the results of a *sort* command, the *use* command must be used to make the newly created file the current file.

EXAMPLE: .sort on lastname to guidisrt

USE

The *use* command is used to retrieve a data base from disk. The syntax of the command is:

use <filename>

Where <filename> is any valid filename.

If any data base is already open when the *use* command is used, the data base is saved and closed before another data base is retrieved from disk.

EXAMPLE: .use guidosrt<enter>

Things To Watch Out For

- To see the results of a *sort* command, you must *use* the file first and then use the *list* command.

ASSIGNMENTS

Assignment #1

A company needs to keep track of payroll type information for its employees. The name and address of the employee are not important since another data base contains that information. The company decides to maintain the following information:

Employee number	5 wide
Department	5 wide
Hourly Rate	5 w/2 decimal places
Union Dues	4 w/2 decimal places
Vacation Hours	3 w/0 decimal places
Vacation Request	3 w/0 decimal places
Insurance Rate	4 w/2 decimal places
FICA Rate	4 w/2 decimal places
State Rate	4 w/2 decimal places
Federal Rate	4 w/2 decimal places
Weekly Hours	4 w/1 decimal place
Year To Date Hours	6 w/1 decimal place

The following fields are based on the amount a person pays per hour for a given item: Union Dues, Insurance Rate, FICA Rate, State Rate and Federal Rate. That is, to determine how much a person will pay for insurance for a given week, take the weekly hours times the insurance rate. To determine how much a person has paid for state taxes so far in a given year, multiply the year to date hours time the State Rate.

Employee number and department are character fields, all other fields are numeric.

You are to create a data base that contains this structure and add information to the data base.

Data will be supplied.

-----PARTS TO BE ADDED-----

Entry of 5 records

Creation of an entry screen

Entry of 20 more records with the new entry screen

Several commands to retrieve data from the data base

Creation of 1 or 2 report formats

Use of the replace command

AND MUCH MUCH MORE

Chapter 15 -- dBase Tutorial

This chapter will give a somewhat detailed explanation of how to do the following:

- Create Guido's data base.
- Display information in Guido's data base.
- Create and print a report for Guido's data base.

WATCH the computer screen while you do the tutorial. If you do not you might as well not waste your time doing it.

This is the structure for Guido's data base.

1	FNAME	Character	13		
2	LNAME	Character	16		
3	TITLE	Character	6		
4	STRADDR	Character	30		
5	CITY	Character	13		
6	STATE	Character	2		
7	ZIP	Character	5		
8	AC	Character	3		
9	PHONENUM	Character	8		
10	LOANAMT	Numeric	8	2	
11	LOANDATE	Date	8		
12	BK	Logical	1		

1. Get into dBase.
2. Type:
Create Guido<enter>
3. The screen will clear and the screen for defining a structure will be displayed. (See page 172.)
4. Type:
fname<enter>C13<enter>

Type in fname and press enter to complete this entry.
 C for character. (no enter necessary)
 Type 13 for the length of the field and press <enter>.

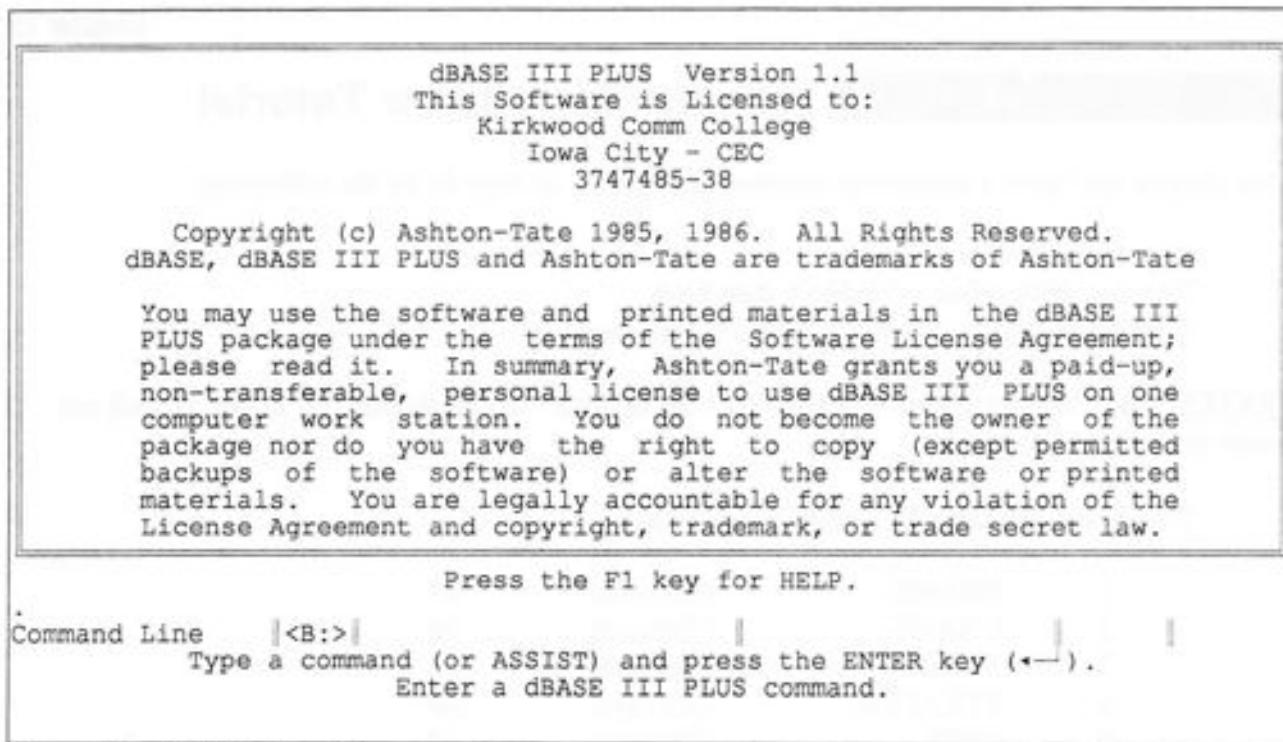


Figure 63 Initial dBase Screen

```
Iname<enter>c16<enter>title<enter>c6<enter>
straddr<enter>c30<enter>city<enter>c13<center>
state<enter>c2<enter>zip<enter>c5<enter>
ac<enter>c3<enter>phonenum<enter>c8<enter>
loanamt<enter>n8<enter>2<enter>
```

This one is a bit different from the previous lines. The field type is numeric so the number of decimal places must be defined. (The 2<enter>)

```
loandate<enter>d
```

This one is also different. Since loandate is a date field, typing D for date not only defines the field type but it also defines the field size. No <enter> is necessary.

```
BK<enter>l
```

This entry is the same as the date entry. A logical field is also predefined to be one character long (for T or F) so a field size cannot be entered here either.

5. At this point the structure has been entered, the screen should look similar to the following:

				Bytes remaining: 3887			
CURSOR <-- -->		INSERT		DELETE		Up a field: ↑ Down a field: ↓ Exit/Save: ^End Abort: Esc	
Char:	← →	Char:	Ins	Char:	Del	Word:	^Y
Word:	Home End	Field:	^N	Word:	^Y	Field:	^U
Pan:	^ ^	Help:	F1				
Field Name	Type	Width	Dec	Field Name	Type	Width	Dec
1 FNAME	Character	13		9 PHONENUM	Character	8	
2 LNAME	Character	16		10 LOANAMT	Numeric	8	2
3 TITLE	Character	6		11 LOANDATE	Date	8	
4 STRADDR	Character	30		12 BK	Logical	1	
5 CITY	Character	13		13		Character	
6 STATE	Character	2					
7 ZIP	Character	5					
8 AC	Character	3					

CREATE ||<B:>||GUIDO | Field: 13/13 | |
Enter the field name.
Field names begin with a letter and may contain letters, digits and underscores

Figure 64 Create Structure Revisited

If it does not, use the cursor keys to move to the error (may be an incorrect field name or size) and type over the mistake.

When all the field definitions are correct, type:

Ctrl-<end>

Remember, this means hold down the control key and press the <end> key.

6. At the bottom of the screen the computer will respond:
Press ENTER to confirm. Any other key to resume.

Press <enter> to save the structure.

7. The computer will next ask if data records are to be entered now. Type Y for yes.
8. The screen will clear and the data entry screen will be displayed. The cursor will be in the fname box. Type the following:

```
Brett<enter>Schuchert<enter>inst.<enter>Wouldn't you like to know.<enter>Iowa
City<enter>IA<enter>52240<enter>
319<enter>351-5702<enter>1000.00<enter>010488 <enter>F<enter>
```

Basically all that is being done is to type the entry and press <enter>. Do not type the slashes on date fields or the periods on the logical fields. Enter the following data:

Shawn	Olsen	Inst.	Jg S. Johnson	Iowa City	IA	52240	319	351-6621	300.00	12/16/88	.F.
Mary	Farlthon	Ms.	Main street	Chicago	IL	66402	312	653-7643	1200.00	12/01/88	.F.
Charles	Bargdon	Inst.	1200 W. Benton	Iowa City	IA	52240	319	337-4666	13000.00	11/01/88	.T.
Linda	Johnson	Dr.	1132 Bloomington	Minneapolis	MN	55402	612	552-1254	1200.00	12/14/88	.F.
Nancy	Larkin		3342 E. 12th Street	St. Louis	MO	44531	612	344-4321	300.00	11/01/89	.F.
Fred	Harrison	Sr.	312 12th Street	Minneapolis	MN	55402	612	344-4321	2300.00	01/06/89	.F.
Larry	Targeniz		2213 12th Street	Downers Grove IL	IL	55332	312	377-9871	5000.00	12/09/88	.T.

Figure 65 Guido's Data

Hitting <enter> after the last entry for BK will advance dBase to the next record. A second blank entry line will be displayed.

The arrow keys can be used at any time to move up, down, right or left through the data to make corrections. The <PgUp> key will move the cursor to the beginning of the previous record. The <PgDn> key will move the cursor to the beginning of the next record.

9. After all information has been entered, press <enter> at the beginning of a blank entry screen. Ctrl-<end> can also be used to save the work, but DO NOT use ctrl-<end> on a blank entry screen, or there will be a blank record in the data base.

The data base has been created and entered. Each record in this data base is 114 characters long (the sum total of the width of each field) which is too long to fit on the screen. (The screen is 80 characters wide) As a result, the following commands to display information will only display a sub-set of the available fields.

10. Type the lettered commands:

- a. Display all fname,lname off to print<enter>

This will display the first and last names without record numbers. Send the output to the printer.

- b. Display ALL fname, phonenum, loanamt to print<enter>

Display the first name, phone number and loan amount. Send the output to the printer.

- c. Display fname, state for loanamt >= 2000 to print<enter>

Display the first name and state for each person whose loan amount is greater than or equal to \$2000. Send the output to the printer.

d. Display lname, loanamt for BK to print<enter>

Display the last name and loan amount for all the people who have broken knees.

e. Display fname, lname, phonenum for .NOT. BK .and. loanamt >= 1000 to print<enter>

Display the first and last name followed by the phone number of everybody without a broken knee and who owe \$1000 or more.

f. Sort on loandate to GuidDate<enter>

Create a sorted file. This will be used later.

In the next series of steps, a report format will be created. The report format should include the first and last names, the phone numbers loan dates of every person in the data base.

11. Type:

Create report Gurpt1<enter>

The screen will clear and the report format screen will be displayed.. Follow these steps to create a report:

12. The options menu should be visible. If not, type:

O

13. Move the selection bar to Page title and hit <enter>.

A smaller box will open up to the right of the options menu. Type the following for the page title. (It will automatically center itself.

Guido's Loan Shark Agency<enter>

<enter>

Report 1, Then entire group.<enter>

<enter>

After the last <enter>, the window will close up.

14. Next compute the length of the report by adding up the field widths and one space between each field.

fname	13
Lname	16
Phonenum	8
City	13
State	2
Loandate	8
=====	
	60
+ 6	
=====	
	66

The page width is 80 characters. This means there are 14 characters left over.
 Divide by two to get a left margin of 7 and a right margin = 7.

15. Position the selector bar over the Left margin selection and hit <enter>. Type:
 7<enter>

Position the selector bar over the Right margin selection and hit <enter>. Type:
 7<enter>

The screen should now resemble Figure 66.

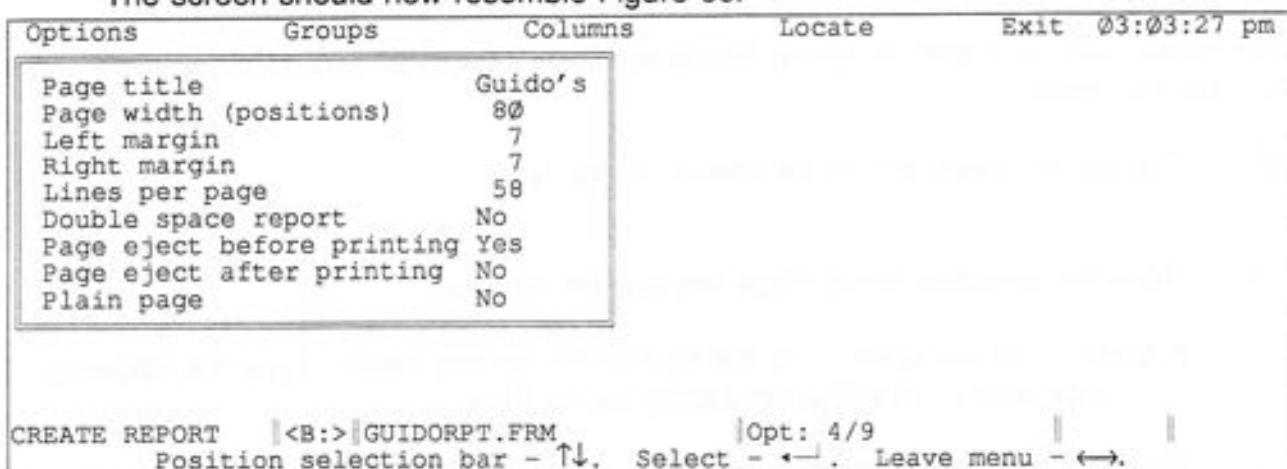


Figure 66 Create Report, Step 1

16. Move the menu selector over to Columns: (Either hit the right arrow key twice or type C.)

Contents	Which field will be used for a given column.
Heading	The column header.
Width	How wide the column needs to be.
Decimal places	The number of decimal places to be displayed. Applies only to numerical data.
Total this column	Also applies only to numerical data. Allows the total to be printed at the end of the report.

Hit <enter> on contents and then type:

fname<enter>

Move the selector bar to Heading and hit <enter>. Type:

First<enter>

Name<enter>

<enter><enter>

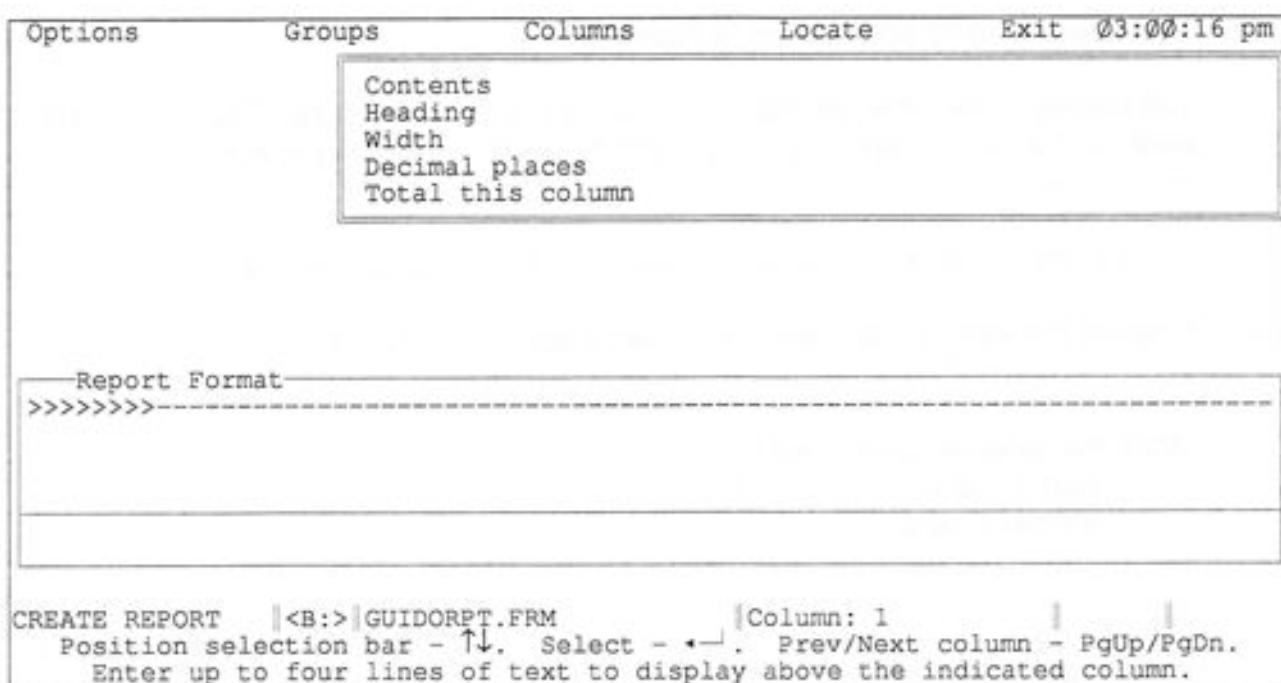


Figure 67 Define Report With Column Sub-Menu.

17. Notice that a small window opened up, the column header was typed and when the header was complete, the window closed.

The width field should reflect the current column width.

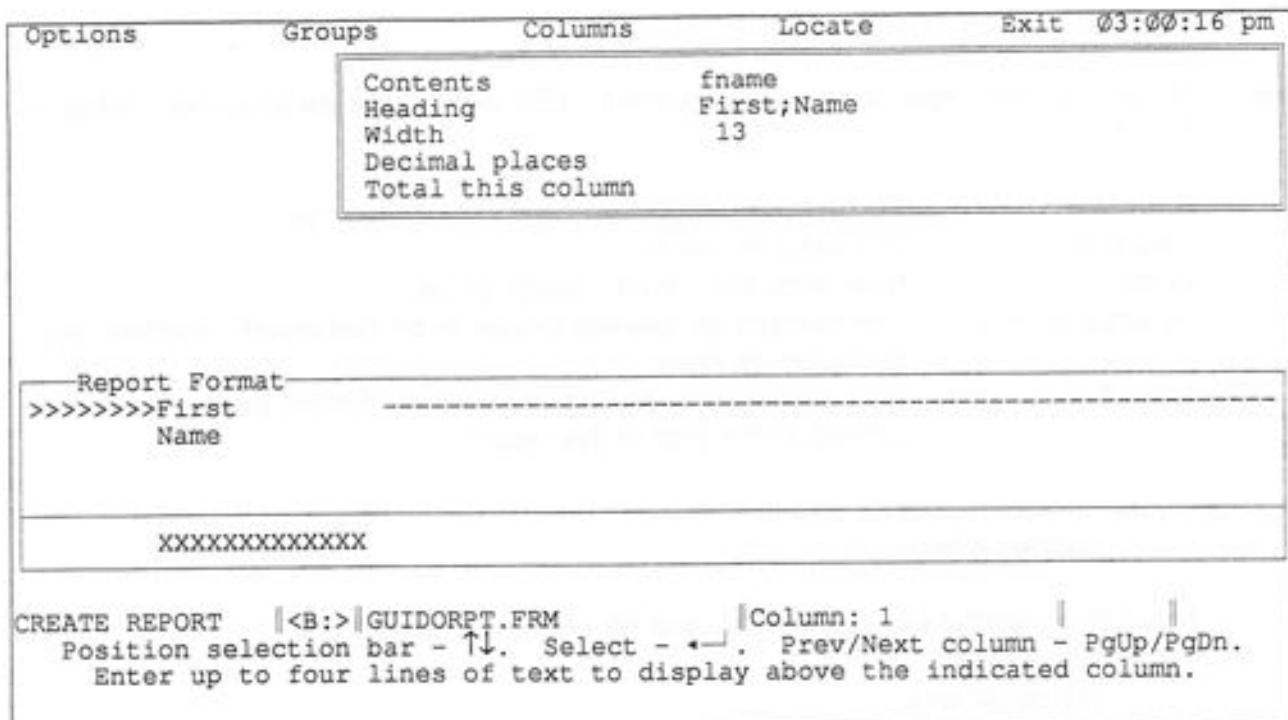


Figure 68 Column 1 Defined

18. The screen should now resemble Figure 68.

The display shows the left margin, (>>>) the column headers, (First Name) the width of the column (the XXXXXXXX) and finally the remaining space. (The ----- -----)

19. Hit <PgDn> to get a new Column menu. (The old one is now one step back)
20. Position the selector bar over the contents option and hit <enter>. Type:
 Iname<enter>

Move the selector bar to Heading and hit <enter>. Type:
 Last<enter>
 Name<enter>
 <enter><enter>

The width field should reflect the current column width. The bottom of the screen should resemble Figure 69.

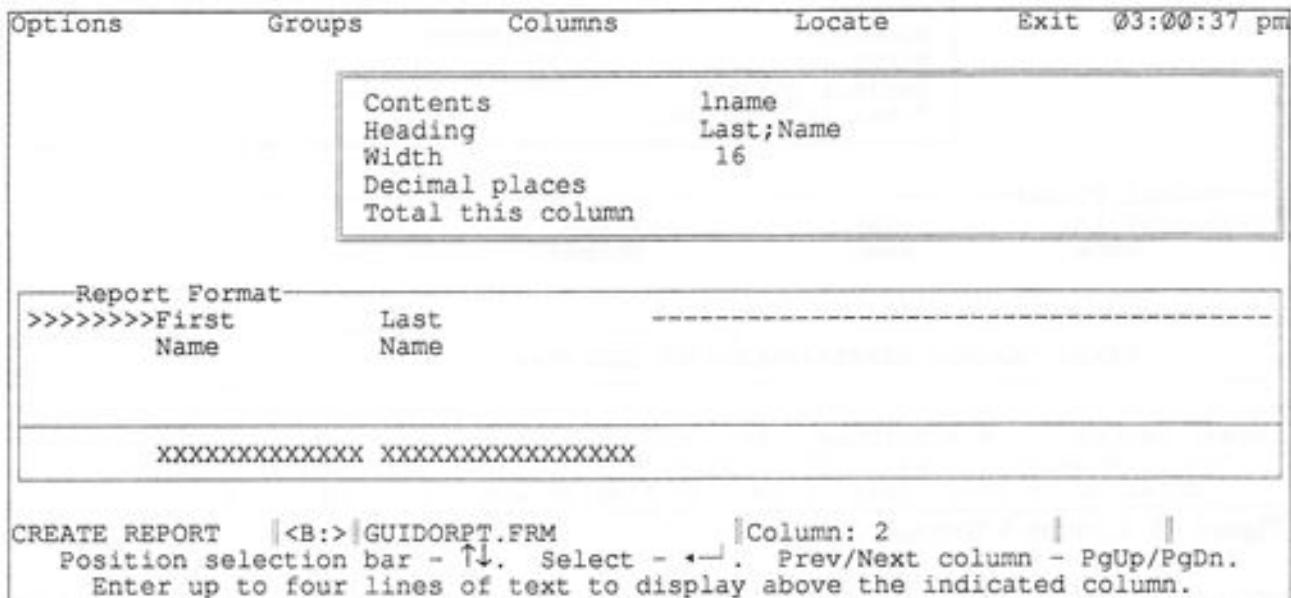


Figure 69 Column 2 Defined

21. Hit <PgDn> to get a new Column menu. (The old one is now one step back)
22. Position the selector bar over the contents option and hit <enter>. Type:
phonenum<enter>

Move the selector bar to Heading and hit <enter>. Type:

Phone<enter>
Number<enter>
<enter><enter>

Your screen should resemble Figure 70.

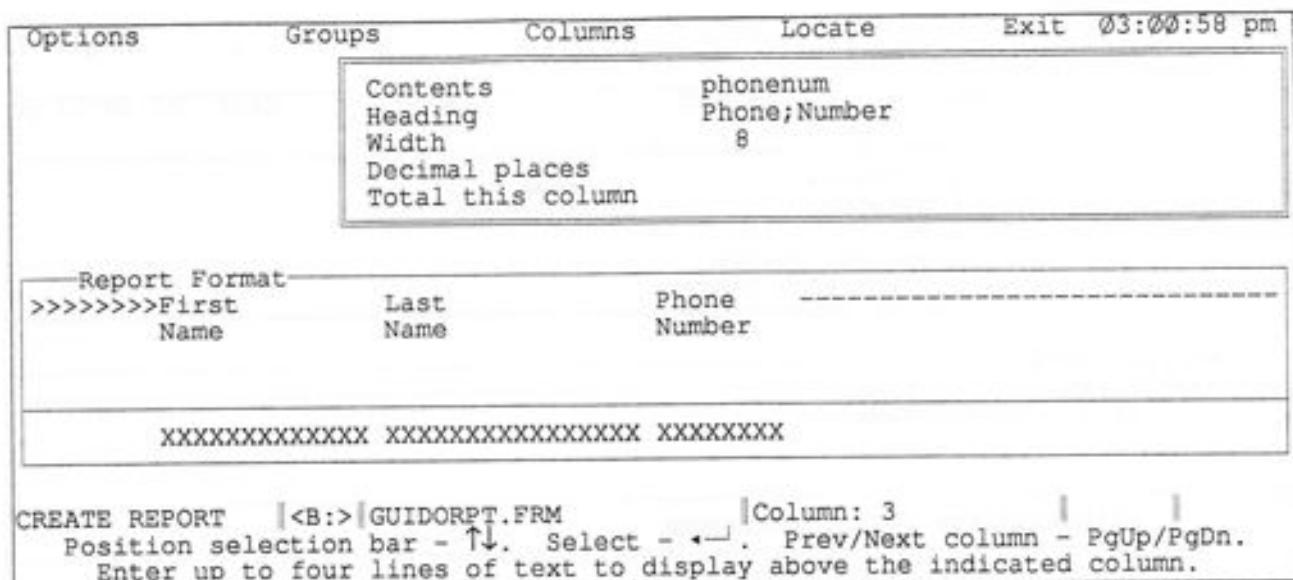


Figure 70 Column 3 Defined

23. Hit <PgDn> to get a new column menu.
24. Position the selector bar over Contents and hit <enter>. Type:
City<enter>

Move the selector bar to Heading and hit <enter>. type:
City<enter><enter><enter><enter>

The bottom of the screen should resemble Figure 71.

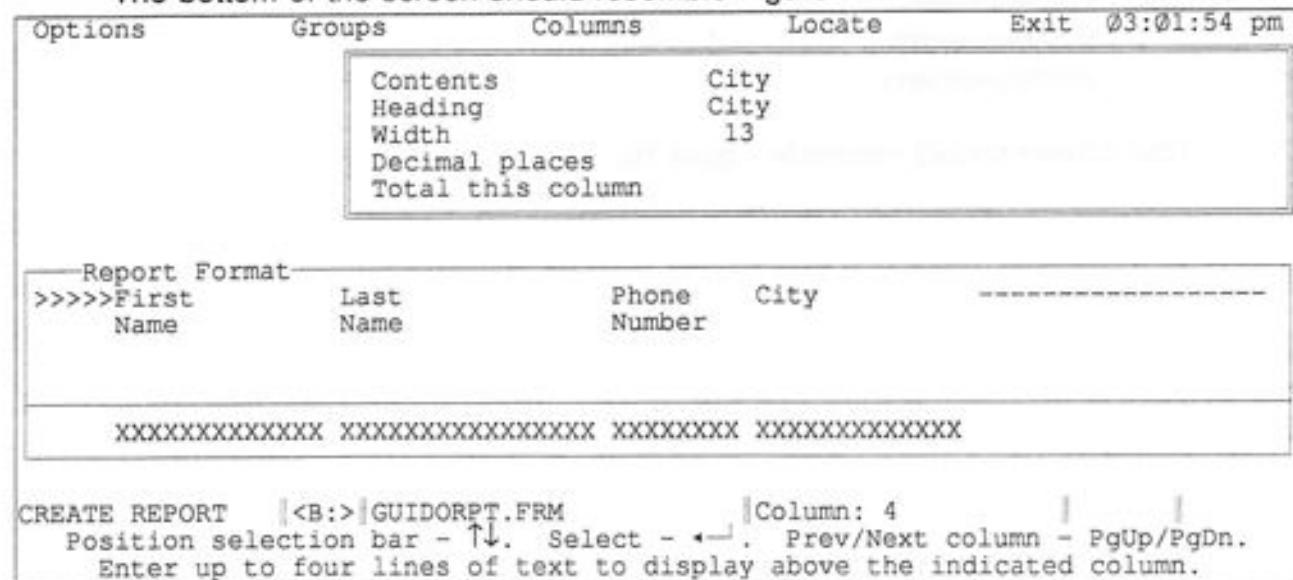


Figure 71 Column 4 Defined

25. Hit <PgDn> to get a new column menu.
26. Position the selector bar over Contents and hit <enter>. Type:
State<Enter>

Move the selector bar to Heading and hit <enter>. Type:

St<enter>
<enter><enter><enter>

For now it is necessary to use St instead of state. The field size is 2 characters but the word state is 5 characters long. Your screen should resemble Figure 72.

Options	Groups	Columns	Locate	Exit 03:02:06 pm
		Contents State Heading St Width 2 Decimal places Total this column		
Report Format Last Name Phone Number City St -----				
XXXX XXXXXXXXXXXXXXXX XXXXXXXX XXXXXXXXXXXXX XX				
CREATE REPORT <B:> GUIDORPT.FRM Column: 5 Position selection bar - ↑↓. Select - ←→. Prev/Next column - PgUp/PgDn. Enter up to four lines of text to display above the indicated column.				

Figure 72 Column 5 Defined

27. Hit <PgDn> to get a new column menu.
28. Position the selector bar over Contents and hit <enter>. Type:
LoanDate<enter>

Move the selector bar to Heading and hit <enter>. Type:

Loan<enter>
Date<enter>
<enter><enter>

The final screen should resemble Figure 73.

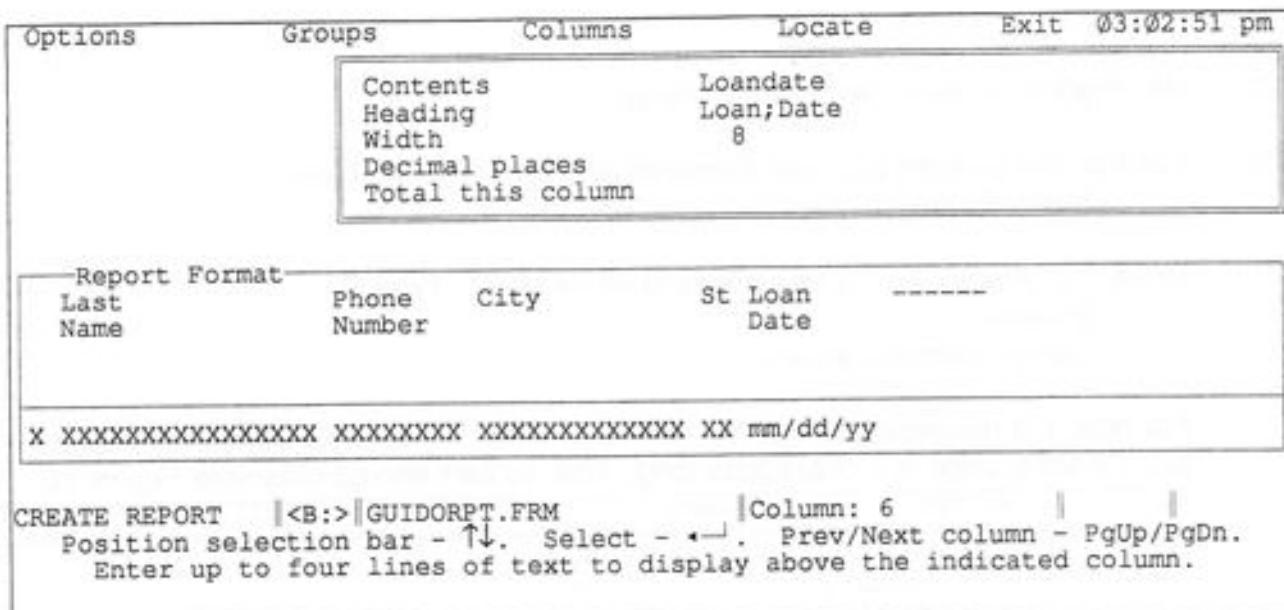


Figure 73 Column 6 Defined

The display will shift to the left as the column entries are made.

29. Check over the screen and verify its correctness. If there are mistakes in any of the columns do the following:

Move the cursor over the Locate menu.

Find the column that has the mistake. (by finding the name of the field that is in the column)

Press <enter> on the field name.

Move back to the Column menu. This allows convenient editing of the already defined columns.

30. When all mistakes have been corrected, position the menu selector over Exit. Select save and press <enter>.

Step 30 takes you back to the dot prompt.

31. Type the following:

report form gurpt1 to print<enter> (See step 11.)

This command generates a report.

32. Retrieve the sort file created in step 10.e, 10.f. Type:
USE gudidate<enter>

33. Type:
report form gurpt1 to print<enter>

Notice that the same report format is being used on two "different" data bases. The data bases are actually the same, the information is just sorted by date in the second data base.

33. Quit out of dBase with the following command:

quit<enter>

Total points for tutorial: 30

This ends the dBase tutorial. The intention of this chapter is not to completely describe dBase but rather to give an overall idea of how the dBase user interface works.

It is not necessary to memorize all of this information, the best thing to do is learn what dBase can do and if something is needed in the future, look it up.

Label formats are not covered because they very closely parallel report formats. The primary difference is that the contents for 1 - 5 lines of a label are needed to define a label while the contents for a series of columns is necessary for a report.

The next chapter gives a few additional assignments for dBase. These assignments are designed to be thorough and tough. Have fun.

Chapter 16 -- dBase Assignments

ASSIGNMENT #1

1. Create the data base contained in Figure 74.

The field names, types and sizes are to be derived from the table. Numeric data is right justified, textual data is left justified. (20)

2. Use the list command to display the following: (The output of all of these commands should be printed when handing in the assignment.)
 - a. Display the data base structure. (1)
 - b. Display the Item name, part number, standard price and Order date for all Items in the Kids Toys department (KT in the Dept field). (2)
 - c. Display the item name, standard price, Sale Cost, number of items in stock and whether the item is on sale or not. Print only the items in the Computer & Electronics department (CE in the Dept field). (3)
 - d. Display the item name and part number for all items whose standard price is greater than \$100. (2)
 - e. Display the Part name, number, standard price and order date for all items that are under stocked (FOR InStock < Min). (2)
 - f. Display the part name, number, standard price and order date for all items that are overstocked. (2)
 - g. Display all sale items. (1)
 - h. Display all the items that are on sale and cost less than \$20 (sale price). (2)
 - i. Display all items that Cost between 50 and 100 dollars. (For the standard price field, not the sale price field.) (3)
 - j. Display the item name, number and date ordered for all items that cost more than five dollars. Only include items in the Men's clothing department (MC in Dept). (3)

- k. Display the part name and stock value for all items that are overstocked. (DISPLAY PART NAME, INSTOCK*STDPRICE FOR ONHAND > MAX.) (2)
 - l. Display the part name, part number and the difference in standard price versus sale price for all items. (DISPLAY PART NAME, PART NUMBER, STDPRICE - SALE PRICE) (2)
 - m. Display the Part name, Order date and stock value for all items in the computer and electronic department. (Stock value = on hand * stdprice) (2)
 - n. Sort the data base by department. Retrieve and print this file. (2)
 - o. Sort the data base by cost within department. (That is, SORT TO <FileName> ON Department, stdprice) Retrieve this file and print it. (2)
3. Create a report format with the following fields: Stock name, stock number, number in stock, minimum, maximum, and order date. Call this report format PARTSORT. (5)
- a. Use this report format on the entire data base (and print the results). (2)
 - b. Use this report format on the data base created in step 2.n (and print the results). (3)
 - c. Use this report format on the data base created in step 2.o (and print the results). (3)
 - d. Change the report to do a subtotal on department.

Follow these steps to add a sub-total:

- i. Type:
MODIFY REPORT PARTSORT<enter>
- ii. Move the menu selector bar to the Groups menu.
- iii. Hit <enter> on the Group no expression.
- iv. Type:
DEPARTMENT<enter>

If you called the department field something other than department, type your field name. (1)

- e. Use the modified report on the 2 files created in steps 2.n and 2.o (and print the results). (5)

Stock Item Name	Stock Number	In Price	Stock Min	Max	Last Order	On Sale	Sale Price	Dept	
Big Swing Set	SWI009BIG	139.95	2	4	10	12/12/88	.F.	124.95	KT
Boy's 24" 10-Speed	B2410	69.95	12	15	32	12/01/88	.T.	59.95	KT
Killer Mutant Mom	KILLER666	24.95	45	20	40	11/12/88	.T.	12.95	KT
Destruction Set 13	DEST13	34.95	34	10	30	12/20/88	.T.	24.95	KT
Large Flannel Plaid	LFP1399	12.95	60	10	40	10/09/88	.T.	10.99	MC
Commodore 64	COM64B	129.95	12	2	8	08/19/88	.F.	99.95	CE
Commodore 1541	COM1541	159.98	5	2	12	09/12/88	.T.	129.95	CE
Bathroom Radio Dlux	BRD12001A	9.95	44	10	30	02/28/88	.T.	4.95	CE
5.25" DSDD Floppy	DISKDSDD	10.95	100	25	80	12/19/87	.T.	4.95	CE
1/2 Drill	DRILL.5	69.99	12	2	15	09/06/88	.T.	54.95	HC
33 Gal Trash Can	33GTC	12.95	44	12	50	01/05/88	.F.	9.99	LG
Battery Alarm Clock	CLOCKBA12	8.95	13	5	20	11/12/88	.F.	6.95	CE
Std. Drill Bit Set	HIDB8	12.50	34	8	29	10/28/88	.F.	11.34	HC
Rake	R11234	12.95	43	10	50	12/03/88	.F.	11.95	LG
Hoe	HOE11009A	14.95	35	10	50	12/03/88	.F.	12.95	LG
Leather Belt, 32"	LB32	9.95	37	10	40	11/12/88	.F.	9.50	MC
Spring Jacket-Large	SJLARGE	29.95	30	10	30	01/06/88	.F.	27.50	MC
HP 28S Adv Sci Calc	HP28S	199.95	4	1	5	11/30/88	.T.	189.95	CE
25 Lbs. Black Clay	BC257761	24.95	6	2	8	10/11/88	.F.	23.95	HC
24 Gal Dehumidifier	DHM109001	59.98	4	1	6	07/02/88	.T.	49.50	HC
Bird Feeder	BF112	13.95	14	5	25	10/13/88	.T.	12.99	HC
Black Dress Socks	BDS0001	4.99	42	15	50	12/01/88	.F.	3.50	MC
Gaudy Tie	GTBADUGLY	1.94	101	0	10	09/09/88	.T.	0.50	MC
Electric Lawn Mower	LM12"ELEC	49.99	9	2	10	11/11/88	.F.	44.99	LG
Lawn&Garden T-Bags	LGBTB33GAL	9.95	56	20	75	12/01/88	.F.	8.95	LG
Uzi 9mm Pistol	UZI9MM	299.95	4	1	7	12/05/88	.F.	279.95	KT

Figure 74 Inventory Data

ASSIGNMENT #2

1. The second assignment is to develop a data base to keep track of a music collection. Use the following fields:

Group	The name of the group.
Title	The title of the album.
Cost	The cost of the album.
YearPub	The year the album was published.
Medium	The medium of the music. i.e. CD, Record, Cassette or 8-Track.
Type	The type of music. (Rock, classical, new wave, jazz.)

(20)

2. Use the display command to display the following:
 - a. All music which costs \$10 or more.
 - b. All music which costs less than \$10.
 - c. Display all music of one type. (i.e. Display all the rock music or all the classical music.)
3. Create a report format that uses at least 4 fields from the data base. Use this report format on the entire data base. (6)
4. Sort the data base by the group name and use the report format from step 3 on the sorted data base. (9)

See Figure 45, page 170 if you need data for this assignment.

ASSIGNMENT 3

1. Create one of the data bases you described in question 1 on page 170. It must have a minimum of 6 fields and 15 records. (15)
2. Create a report format that uses at least 4 fields from your data base. Use this report format on the entire data base. (10)

Chapter 17 -- Computer Terminology

ACCOUNTING PACKAGES

Software programs used to keep general ledgers, accounts payable, accounts receivable, payroll, job cost, inventory and other types of accounting.

ALPHANUMERIC

The symbols which comprise the letters of the alphabet and single digit numbers. Often this term also includes other printable symbols such as the following:
!@#\$%^&*()_-+={[]};;"|\<,>,.?/~/.).

ANALOG

Information which is represented by a continuously flowing signal. Compare Figure 75 with Figure 81 to get an idea of the relationship between analog and digital signals.

Examples include music from a record, a pulse rate, passing of time ...

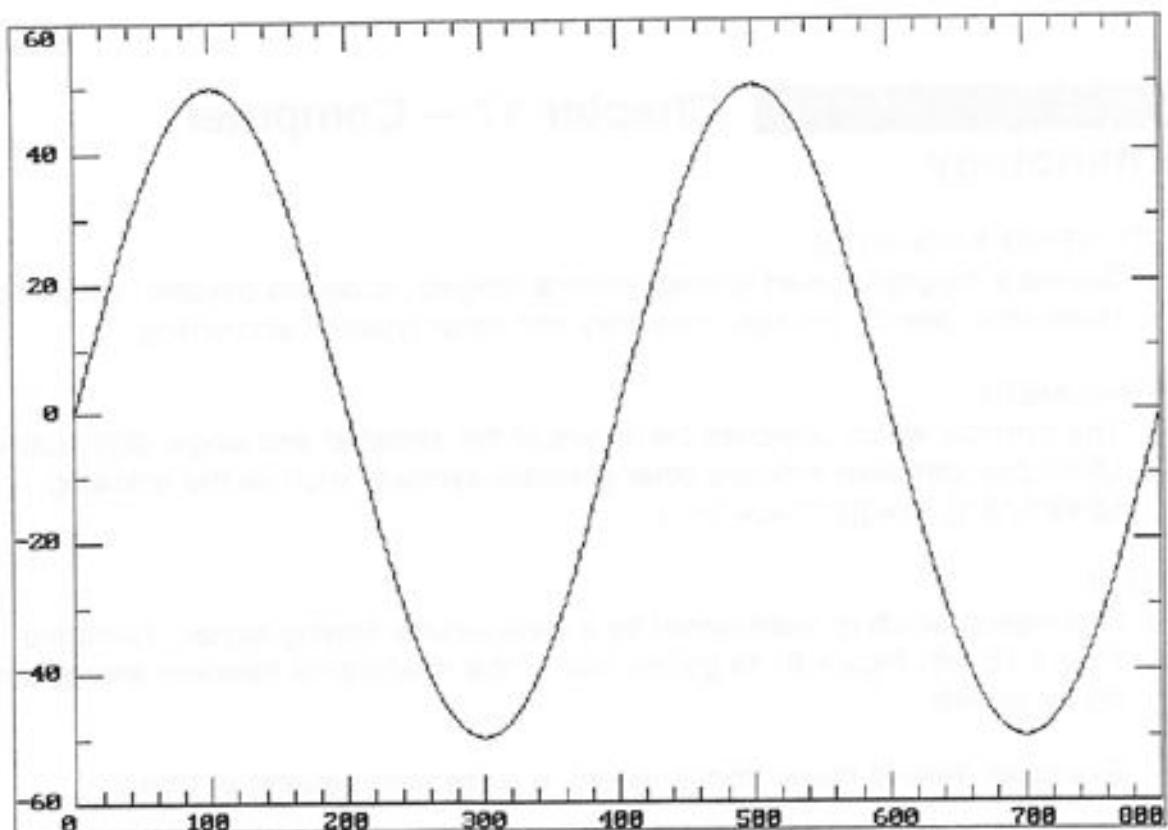


Figure 75 Analog Sine Wave

APPLICATION SOFTWARE

Application software is created to perform specific tasks. E.g. word processing software is used to create memos, papers, books and other forms of correspondence.

ASCII (American Standard Code for Information Interchange)

A code which assigns a numeric value to special characters, symbols, the alphabet ... For example, the number 48 represents the digit zero while the number 65 represents a capital letter A. See Figure 76.

000 NUL	016 DLE	032 SP	048 0	064 @	080 P	096 `	112 p
001 SOH	017 DC1	033 !	049 1	065 A	081 Q	097 a	113 q
002 STX	018 DC2	034 "	050 2	066 B	082 R	098 b	114 r
003 ETX	019 DC3	035 #	051 3	067 C	083 S	099 c	115 s
004 EOT	020 DC4	036 \$	052 4	068 D	084 T	100 d	116 t
005 ENQ	021 NAK	037 %	053 5	069 E	085 U	101 e	117 u
006 ACK	022 SYN	038 &	054 6	070 F	086 V	102 f	118 v
007 BEL	023 ETB	039 ,	055 7	071 G	087 W	103 g	119 w
008 BS	024 CAN	040 (056 8	072 H	088 X	104 h	120 x
009 HT	025 EM	041)	057 9	073 I	089 Y	105 i	121 y
010 LF	026 SUB	042 *	058 :	074 J	090 Z	106 j	122 z
011 VT	027 ESC	043 +	059 ;	075 K	091 [107 k	123 {
012 FF	028 FS	044 ,	060 <	076 L	092 \	108 l	124
013 CR	029 GS	045 -	061 =	077 M	093]	109 m	125 }
014 SO	030 RS	046 .	062 >	078 N	094 ^	110 n	126 ~
015 SI	031 US	047 /	063 ?	079 O	095 _	111 o	127 DEL

Figure 76 ASCII Code Table

BASE EIGHT

(See also BASE TWO, BASE SIXTEEN and BASE TEN)

A numbering system generally used in conjunction with computers. This numbering system uses 8 digits to represent numbers. (Note that 8 is 2^3 .) The digits 0 - 7 represent the values zero through seven.

Numbers are computed by taking the value of the digit multiplied by 8 raised to the power of its offset from the right of the number. Consider the number 34771_8 . To determine the value of this number do the following.

$$1 \times 8^0 + 7 \times 8^1 + 7 \times 8^2 + 4 \times 8^3 + 3 \times 8^4 = 14841_{10}$$

The octal numbering system and the binary numbering system are closely related since both of their bases are powers of two. The binary numbers are very closely

related to the inner workings of a computer but are very cumbersome to work with ($34771_8 = 1110011111001_2$). The octal numbering system simplifies number representation.

BASE SIXTEEN

(See also BASE TWO, BASE EIGHT and BASE TEN)

A numbering system generally used in conjunction with computers. This numbering system uses 16 symbols to represent numbers. (Note that 16 is 2^4 .) The digits 0 - 9 represent the values zero through nine. The letters A through F represent the values ten through fifteen.

Numbers are computed by taking the value of the digit multiplied by 16 raised to the power of its offset from the right of the number. Consider the number $10AFF0_{16}$. To determine the value of this number do the following.

$$0 \times 16^0 + F(15) \times 16^1 + F(15) \times 16^2 + A(10) \times 16^3 + 0 \times 16^4 + 1 \times 16^5 = \\ 1,093,616_{10}$$

The hex numbering system and the binary numbering system are closely related since both of their bases are powers of two. The binary numbers are very closely related to the inner workings of a computer but are very cumbersome to work with ($10AFF0_{16} = 10000101111110000_2$). The hex numbering system simplifies number representation.

BASE TEN

(See also BASE TWO, BASE EIGHT and BASE SIXTEEN)

Base ten refers to the numbering system used for normal number representation. Notice that the word, "base" refers to the number of unique digits. The ten digits 0 through 9 are used to represent numbers.

In a base ten numbering system, the digits are multiplied by 10 raised to a power. The digit's offset from the right side of a number determines the power.

For example, consider the number 534267. In grade school we were taught to evaluate the number with the following method.

There are 7 ones, 6 tens, 2 hundreds, 4 thousands, 3 ten thousands and 5 hundred thousands.

Another way to get the same result is as follows:

$$7 \times 10^0 + 6 \times 10^1 + 2 \times 10^2 + 4 \times 10^3 + 3 \times 10^4 + 5 \times 10^5$$

Notice that the first digit (the 7) is zero places to the left of the right side of the number. 10^0 is equal to 1. The second digit (the 6) is one place to the left of the right side of the number. 10^1 is equal to 10 . (10^5 is equal to $10 \times 10 \times 10 \times 10 \times 10$ or 100000 .)

BASE TWO

(See also BASE EIGHT, BASE TEN and BASE SIXTEEN)

Binary numbers or base two, is a numbering system that uses only the digits 0 and 1.

Consider the number 101010_2 (the $_2$ refers to the base of the number).

One way to "read" this number is to do the following:

0 Ones, 1 two, 0 fours, 1 eight, 0 sixteens and 1 thirty two.

Another way to read this number is as follows:

$$0 \times 2^0 + 1 \times 2^1 + 0 \times 2^2 + 1 \times 2^3 + 0 \times 2^4 + 1 \times 2^5$$

2^0 is equal to 1, 2^1 is equal to 2, , 2^5 is equal to 32. (2^5 is equal to $2 \times 2 \times 2 \times 2 \times 2$ or 32.)

BATCH SYSTEMS

A batch system receives a large amount of input and processes this input without human intervention. When the processing is completed, the system puts the result somewhere and is finished.

BINARY NUMBER

See BASE TWO.

BINARY REPRESENTATION

Inside the computer is a series of electronic switches. These switches can either be on or off, i.e. they have two states. Binary numbers nicely parallel the idea of a computer being comprised of a collection of switches.

BIT (BInary digiT)

A Bit is the smallest piece of information that a computer can deal with. It can have one of two values, 0 or 1. (OFF or ON.)

BIT MAPPED

A mode of operation on the computer where individual pixels on the screen can be turned on or off. A bit mapped screen is used to display graphics.

BUFFER

A buffer is a temporary holding place where data is placed until it can be processed. The buffer normally resides in memory.

BYTE

A byte is a collection of eight bits. It can represent the numbers 0 through 255. This is generally the size of data the computer works with at any given time. The number 8 was picked since it is a power of two. ($2^3 = 8$).

CD ROM

Compact Disk ROM is used to store large amounts of data on a compact disk. The CD is placed in a CD player and the information is sent to a computer via a parallel port or serial port. Note that a CD ROM reads the digital information off a CD and sends this digital signal to the computer. A CD player used in most home stereo systems converts the digital signal to an analog signals and sends the signal to an amplifier.

CGA (Color Graphics Adaptor)

A CGA screen has up to 4 colors and can be used to display graphics. CGA was the first attempt at graphics that IBM used on their original PCs.

CHIP

A piece of plastic with a silicon wafer in the middle and connecting wires. A chip contains the circuitry necessary to make a computer function.

Chips are also called integrated circuits.

CLI (Command Line Interface)

This type of systems software uses a prompt (A> for example) to tell the user it is ready to perform a task. The user types a command with optional parameters and a task is performed.

COMMAND

A command is an instruction to perform some action. In the context of this book, a command refers to entering an instruction on a keyboard to perform some task.

COMPILED LANGUAGE

In compiled languages, all of the program lines are converted to a machine readable form once and stored. When the program is executed, the program has already been transformed so the computer can just run the program.

COMPUTER

A computer is an electrical device which performs the following operations: add, subtract, multiply, divide and compare. The computer only works with numeric values, but these values can represent other types of data. (See ASCII above.)

COMPUTER LANGUAGE

A computer language is used to give the computer instructions on HOW to perform tasks. A computer language is to a computer as a language is to human communication.

Computer languages are a type of software which facilitates creation of programs. Languages have a set of syntactic as well as semantic rules that must be followed when programming.

Most languages are designed to serve a special purpose. FORTRAN (FORmula TRANslation) is used when numerical calculations need to be performed.

The following three programs, written in different computer languages, perform the same task; they each print the numbers 1 through 30.

```
#include <stdio.h>
main()
{
    int i;
    for (i=1;i<=30;i++)
        printf("%d\n", i);
    return;
}
```

```
10      For I = 1 to 30
20      Print I
30      Next I
40      End
```

Figure 78 BASIC

```
PROGRAM Print_30(Output);
VAR
    I:Integer;
Begin
    For I := 1 to 30 do
        writeln(I);
End.
```

Figure 77 Pascal

Figure 79 C

COMPUTER SYSTEM

A computer and its peripheral devices.

For example, a computer system can be made up of one 3½" 1.44 Meg floppy, one 5¼" 1.2 Meg floppy, an 80 Meg hard drive, analog color monitor, VGA graphics, HP DeskJet printer, mouse, modem, two serial ports, one parallel port, 640 K of RAM and 384 K of extended memory.

COPROCESSOR BOARD

A coprocessor board adds an additional CPU to the computer. With two CPUs, the computer can do two things at once.

CPU (Central Processing Unit)

The CPU is the part of the computer that performs arithmetic and logical operations of the computer and manages the flow of data through the system.

CURSOR

Usually a flashing line or block on the screen. It points to where a character will appear when it is typed. NOTE: the cursor does not always flash.

CYLINDER

A cylinder is a conceptual separation of the various parts of a hard drive or multi-platter drive.

In a device like a hard drive, multiple platters are placed on top of one another. See Figure 80.

Like a track, a cylinder is a region on the surface of the platter. The difference is that a cylinder includes the same track on each platter in a multi-platter device.

DATA

Raw facts. The successful processing of data produces information.

DATA BASE MANAGEMENT SYSTEMS

Software created to keep track of large quantities of data. A membership list, recipes and inventory are examples of data that might be collected into a data base. Once the information is collected, the data base allows the user to retrieve certain parts of the data base depending on specified conditions.

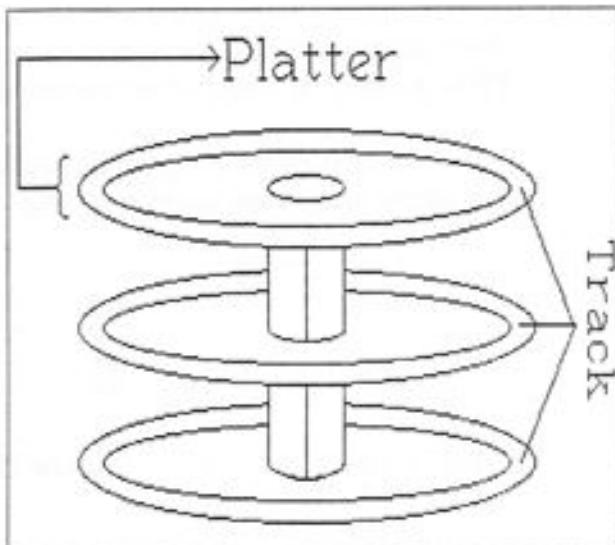


Figure 80 Platter Layout

DECIMAL

See BASE TEN.

DEFAULT DRIVE

See LOGGED DRIVE.

DENSITY

A measure of the number of tracks on a disk. The actual number of tracks depends on the type of disk. Classifications are:

- SD Single Density
- DD Double Density
- HD High Density

DEVICE

A device is some object which is either physically part of or connected to a computer system. Printers and disk drives are examples of devices.

A device is connected to the computer to perform a specific task. The printer is used to generate hard copies while a disk drive is used to read and write information to and from the disk.

DIGITAL

Information which can take on only certain values. Information which is represented by a discontinuously flowing signal. Compare Figure 75 with Figure 81 to get an idea of the relationship between analog and digital signals.

An example of digital information is the electronic signals in a computer. Each signal represents a value of on or off.

DISK

A storage media used with a disk drive to save and retrieve data.

The surface of a disk is magnetic in nature and stores information in a series of magnetic impulses. The disk is organized into tracks and sectors. See Figure 82.

In Figure 82, the numbers 1 through 5 (organized horizontally) represent track numbers. Each complete arc (circle) is one track.

The track is further broken up into smaller segments. Each of these segments is called a sector. The numbers 1 through 8, in Figure 82, around the metal hub represent sectors.

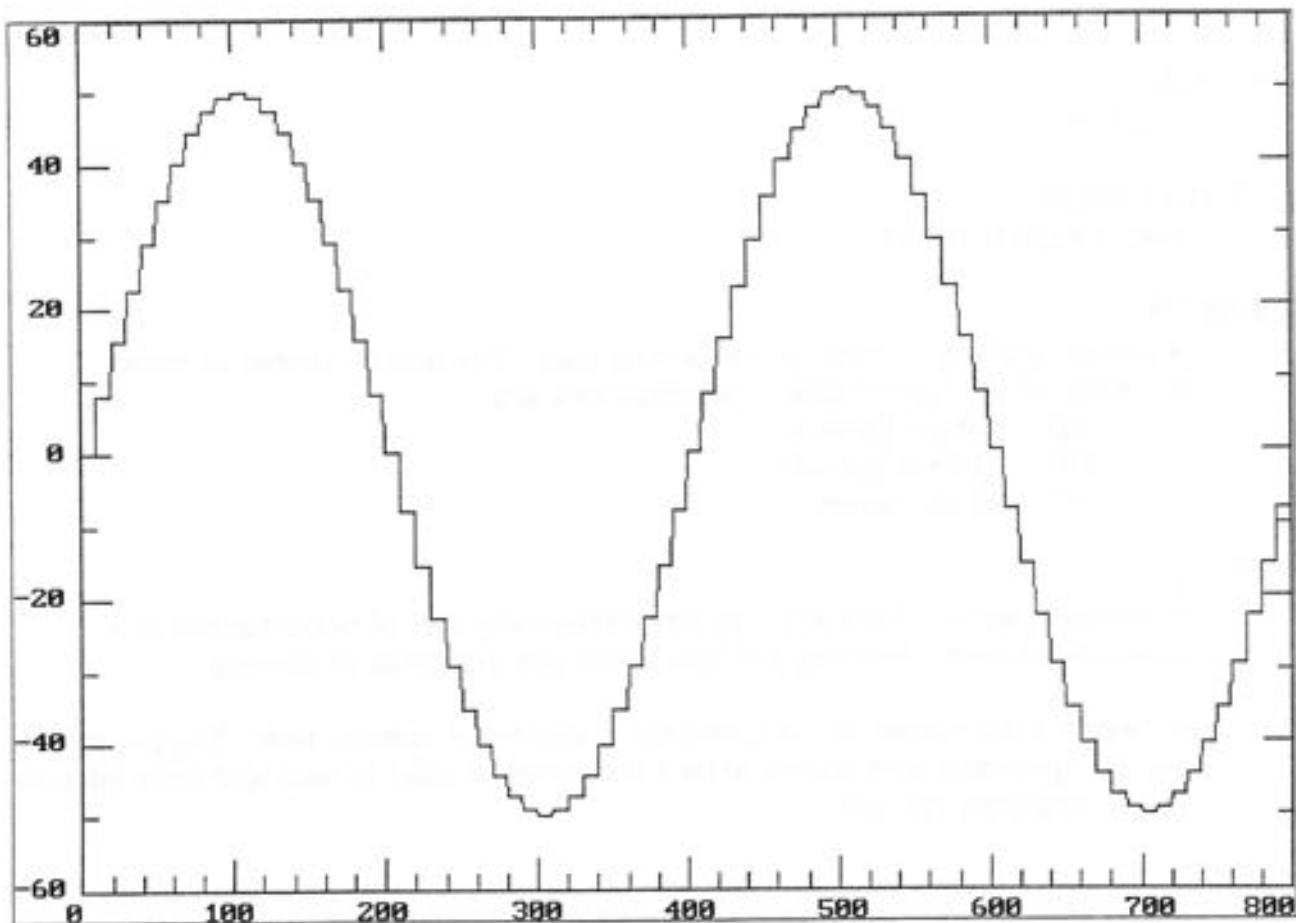


Figure 81 Digital Sine Wave

On a 3½" DSDD disk there are 80 tracks, 9 sectors per track and both sides are used. Each sector holds 512 bytes of information. The total storage available on one 3½" is therefore:

$$(80 \text{ tracks}) \times (9 \text{ sectors/track}) \times (512 \text{ bytes/sector}) \times (2 \text{ sides}) = \\ 737,280 \text{ bytes or } 720 \text{ K.}$$

DISK DRIVE

The storage device used to read/write information to/from the disk.

The disk drive uses a read/write head, like the one in a cassette deck, to place magnetic signals onto the disk. The disk drive is an input and an output device used for storage purposes.

DMA (Direct Memory Access)

DMA is used to allow input and output devices to write to and read from memory directly. On older machines, when input was received from a device, the CPU

had to handle getting the data from the device and putting it in memory for later usage. Since I/O devices operate much slower than the CPU, the CPU had to wait for the device to finish. With DMA, the CPU tells the device to put its data in a certain memory location. The CPU may need to wait for the input to be completed, but it can process other information while waiting for the device to finish.

DOS (Disk Operating System)

See the discussion on page 16.

DRAFT

Refers to the quality of printing on a printer. Draft printing is low quality, high speed printing. Draft mode is generally used to print rough drafts. Using draft mode saves printer ink and gives printed results faster.

DRIVE LETTER

A drive letter indicates which disk drive is being used. Valid drive letters are A: and B:. C: may be included if a hard drive (or fixed disk) is included in a system.

DOCUMENT

Text contained in a file or in the memory of the computer. This term is associated with word processing, text editing or desktop publishing.

DOT MATRIX

1. Process by which letters are formed by a group of dots. See Figure 83 for an example on how letters can be formed with dots.
2. Refers to all impact printers that use dot matrix to form characters.

END USER

The person who uses a completed product.

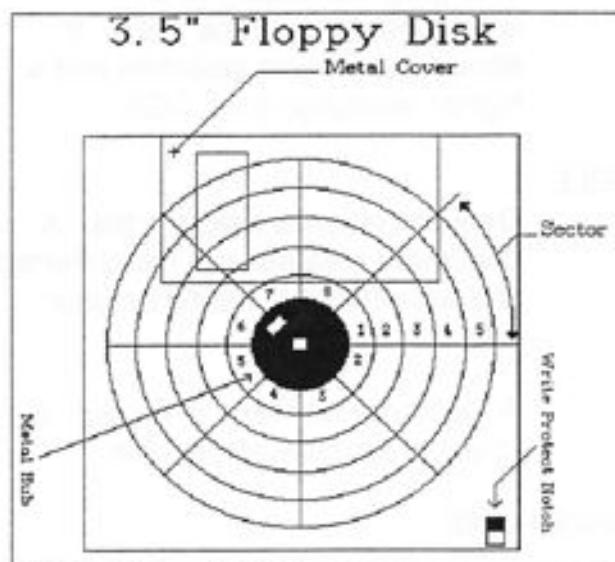


Figure 82 -- A Disk

EGA (Enhanced Graphics Adaptor)

This graphics display is an enhancement over the CGA. It allows better color selection and a higher resolution than CGA.

FILE

Data stored on a disk is a file. A document created with Word Perfect is a file when it is stored on your disk.

A file name identifies a file with a physical location on the disk.

FILE NAME

A file name relates information to a physical location on the disk drive.

Valid file names can include most alphanumeric characters excluding * and ?. A file name can have 1-8 alphanumeric characters followed by an optional . (period) and 1-3 additional alphanumeric characters.

FIRMWARE

Software put into a hardware case. The best example of this are games for home video game systems. The games available for a home video game system are programs which have been placed on chips and put in a plastic protective case.

FIXED DRIVE

See hard drive.

FORM FEED

Forcing some device to advance to the beginning of the next form. On a printer this refers to ejecting the current page and aligning the paper at the beginning of a new page.

FORMAT

1. Prepare a disk for use on a specific machine.
2. Change a document to conform to some standards. e.g. 1" margins, page numbers ...

GRAPHICS

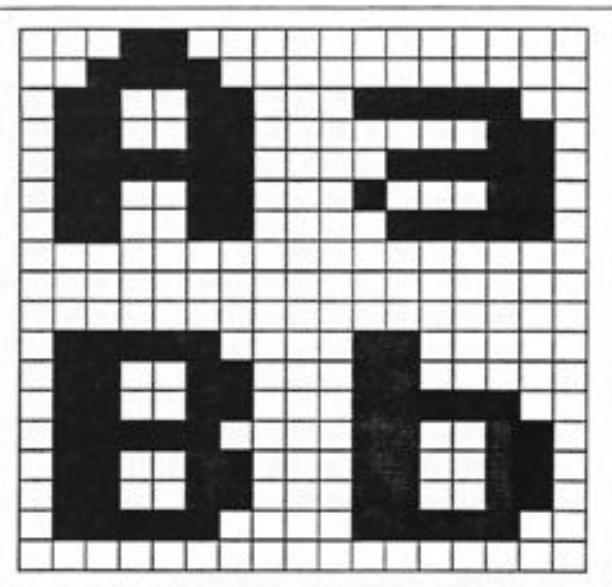


Figure 83 Dot Matrix

A mode of operation on the computer which allows pixels on the monitor's screen to be a certain color. The range of colors, total number of colors, number of pixels across and number of pixels down is determined by the type of graphics (CGA, EGA, VGA ...) the computer has. Graphics allow graphs, charts and pictures to be displayed on a screen. See also RESOLUTION.

HARD DRIVE

A device and a media contained together in one case. Hard steel platters contained in a dust-proof container are used like the media on a floppy disk. Since the platters are rigid, locating the read/write head is more accurate and more information can be stored on the platters. Also, since the platters are hard, they can spin much faster, allowing information to be found more quickly. Hard drives are high capacity storage devices which transfer information at a relatively high rate.

HARD COPY

Output received from a printer or plotter.

HARDWARE

A physical component. Some component which is physically part of the computer system. If it can be touched, its hardware.

Hardware and firmware are closely related. Firmware performs some task via a program placed in a hardware case. Hardware performs some task by circuitry which represents the logic of the device. Both hardware and firmware can be touched.

HEXADECIMAL

See BASE SIXTEEN.

HIGH LEVEL LANGUAGE

Computer languages that allow programming at a more abstract level at the expense of speed. High level languages can be used on more machines than low level languages. High level languages go through more conversion than do low level languages.

I/O DEVICE

A device connected to a computer system to perform input and/or output to or from a computer. I/O stands for input/output.

ICON BASED

This type of systems software uses icons(pictures) to represent tasks. A pointing device, such as a mouse, is used to select a task and the task is performed.

IMPACT

A part of the printer strikes an ink ribbon imprinting an image on paper. Dot matrix printers are an example of impact printers.

INKJET

An inkjet printer sprays dots of ink onto the paper. This is a non-impact dot matrix printer.

INPUT

Entering of data or instructions into the computer system via a device.

INTEGRATED SOFTWARE

Software which includes several of the above software types to produce a "complete" package. Integrated software allows data to be shared between different types of programs in an easy manner.

INTERACTIVE SYSTEMS

An interactive system requires a user to be involved with all or most of the steps in a process. Word processing is an example of an interactive system. The user types information into the computer, formats the document and prints the results.

INTERPRETED LANGUAGE

In an interpreted language, each line of the program is converted to machine language and executed. If the same line is encountered more than once, the line is converted to machine languages each time the line is executed.

K (KILOBYTE)

$1024 (2^{10})$ bytes. Written as either 1K or 1 kilobyte.

KEYBOARD

The keyboard allows the user to type alphanumeric characters, function keys and other special keys. When a letter is typed on the keyboard and the character typed is sent to the computer via the keyboard port. What the computer does with this character is entirely up to the program controlling the computer at the time of the key press.

LASER PRINTER

The image of an entire page is formed in the memory of the laser printer. The laser printer uses an electrostatic drum to put magnetic toner on a page. Laser printers use a dot matrix system to define the images, but the resolution is high enough that the images created appear to be of letter quality.

LETTER QUALITY

Letter quality printers use fully formed characters to generate images. A typewriter is an example of a letter quality device. Fully formed letters are pressed against a ribbon and transferred onto paper.

Examples of letter quality printers:

Thimble

A thimble shaped object contains the letters. The thimble turns to the letter to be printed, presses the letter against a ribbon and an image is formed on the printed page.

Daisy Wheel

An object shaped like a flower, with one pedal for each letter, (upper and lower case) is used to generate images. The wheel turns to the letter and presses the pedal against the ribbon.

LIGHT PEN

A light pen is touched to a screen, checks the scan beam of the monitor to find the pen's location and sends the location to the computer.

LINE FEED

Advancing a device from one line to the next. On the printer this refers to moving the paper to the next line.

LOGGED DRIVE

The drive that DOS will look at for programs or data unless otherwise told to do so. The DOS prompt, A> or B>, lists the logged drive.

LOW LEVEL LANGUAGES

Computer languages that closely follow the logic and internal structuring of a given computer system. Low level languages are designed for a specific brand of computer and cannot generally be used on another brand machine.

MEDIA (MEDIUM)

The material used to store information. Paper is the media used by a printer. The disk is the media used by the disk drive to store data/programs.

MEMORY

A component of a computer that can hold data/information/instructions. The memory of a computer is generally volatile.

MICR (Magnetic Ink Code Recognition)

A MICR device reads magnetic letters and numbers off paper. The number on a check is written with magnetic ink. Once the MICR device has read the number, the number can be sent to a computer.

MODEM (MODulator/DEModulator)

A device hooked up to the computer system to convert digital information to analog information. The analog form of the information can be transferred over a phone line. The device also converts analog information from a phone line back to digital information.

MONITOR

A device used to view what the computer is doing. It is a T.V. like device which the computer uses to display information. Graphs, text and other visually oriented information can be displayed on monitors. The information on the screen of the monitor is often called a soft copy (as opposed to a hard copy) since this information cannot be retained permanently. (Or if it is you need a new monitor.)

MONOCHROME

A display adaptor which allows two colors on a text screen. Black and white, Green and black or Amber and black are available. This video adaptor, as produced by IBM, did NOT allow graphics but did allow better displaying of text.

Hercules Corporation made an enhancement to the IBM monochrome display which added graphics. The graphics allowed two colors and several more pixels on the screen than the CGA.

MOUSE

A mouse is a pointing device. It is moved across a flat surface. Generally there is a special cursor or icon³⁴ on the screen to represent the location of the mouse. As the mouse is moved, the icon moves in the same direction. The mouse allows the user to select options on the screen by moving the mouse over the option and hitting a button.

NLQ (Near Letter Quality)

The term refers to the print quality of a printer. The letters generated by some printer are formed with dots instead of fully formed characters. NLQ uses more dots per character than draft printing and, as a result, is nearer to letter quality output than is draft printing.

³⁴An icon is a graphic image.

NON-IMPACT

Non-impact printers do not actually touch the paper. Laser printers attract magnetically charged toner particles to the page. Inkjet printers spray ink on the page. Thermal printers burn images onto the page.

NONVOLATILE

Information that is retained when the power is shut off.

NUMERIC COPROCESSOR

A numeric coprocessor aids the computer by doing the computations for the CPU. When math is requested by a program, the CPU normally computes the result. With a numeric coprocessor, the CPU allows the numeric coprocessor to take the numbers and compute the result. The numeric coprocessor is dedicated to mathematical computations and can perform them much faster than the CPU.

NYBBLE

Four bits make a nybble. Two nybbles make a byte.

OCTAL

See BASE EIGHT.

OUTPUT

Information sent from the computer to an output device.

PARALLEL

Transmission of data one byte, eight bits, at a time. Printers are often hooked up via a parallel port. Note that transmission of more than 8 bits at a time is also considered parallel transmission.

PARAMETER

Information supplied with a command to complete the command. Consider the following command,

`DIR A:<enter>`

The command is DIR. The DIR command displays a DIRectory of a disk. A: is the parameter. By default the DIR command will display the directory of the logged drive. The parameter A: tells the DIR command to display a directory of the A: drive regardless of the what the logged drive is.

PERIPHERAL DEVICE

A device connected to a computer via a cable. A printer or monitor is a peripheral device. Devices which are physically contained within the casing of the computer are not peripheral devices. Hard drives and disk drives are generally not peripheral devices. NOTE: the monitor on the IBM PS/2 Model 25 is NOT a peripheral device since it is contained within the case of the computer.

PIXEL

A individual dot on the monitor's screen.

PART

A point of connection between a computer and peripheral device.

PRINTER

A peripheral device used to produce hard copies. The printer receives information from the computer and copies this electronic information into a human-readable form on paper. The printer produces alphanumeric characters, graphs and other visual information on paper.

Two categories of printers are non-impact and impact.

PROCESS

A series of actions that produces a predictable result based on the input. The computer processes input (data) and generates output (information).

RAM (Random Access Memory)

The RAM of a computer, also called memory, is used to store information and intermediate results of a process. Information in RAM is lost when the computer is shut off and it is therefore call volatile memory.

RESOLUTION

The resolution of a graphics system determines its quality. Higher resolution means more pixels to work with and more detail which can be displayed.

Example resolutions:

CGA	320 x 200 x 4 colors.
EGA	640 x 350 x 16 colors.
VGA	640 x 480 x 16 colors.
	320 x 200 x 256 colors.

ROM (Read Only Memory)

ROM supplies the information necessary to interact with devices at the most basic level, such as what to do when the power switch is turned on and how to turn on

a disk drive. Information contained in ROM is NOT lost when the computer is shut off and it is therefore called nonvolatile memory.

SECTOR

A sector is section of a track on a disk. Information on the surface of a disk is organized into tracks and sectors. See Figure 82 and the discussion on disks.

SERIAL

Transmission of data one bit at a time. Communications between a modem and a computer is generally done via a serial port.

SOFTWARE

A collection of instructions which tell the computer what to do and how to do it. Software is written in a computer language and is used to perform some task. Examples of software are spreadsheets, data bases and word processors. This book was written using a word processor to place the text and pictures on the page.

There are different types of software. The classification of software is basically arbitrary. The two major types are systems and application software.

SPEAKER

The IBM PC family of computers has a very limited sound capability. The output of a program can be tones played on the speaker of the computer.

SPREADSHEETS

Spreadsheets are used to manipulate numbers, plan budgets and other numerically related tasks. Spreadsheets allow the user to organize numbers into columns and rows and then to perform complicated math on those numbers.

STORAGE

Permanent holding of information. This term is used in one of two manners. The first is in reference to an amount, while the second refers to the action of holding onto information. Examples of usage:

1. This disk can store 720K of data.
2. Store that file on my work disk so I can look at it later.

SYSTEMS SOFTWARE

Systems Software is used as an interface between information being entered into and received from the computer. This interface includes working with I/O devices as well as humans.

Systems software is the human interface. It allows the user to work with the computer and the computer to work with the various devices.

There are two major classifications of systems software, Icon (or graphically) based and CLI (Command Line Interface).

TEXT

1. Data typed into a document.
2. Alphanumeric data.
3. A mode of operation on the computer where the screen contains alphanumeric information. While the screen is in text mode, graphs, charts and pictures cannot be displayed on the screen.

TELECOMMUNICATION

Software used to allow communication between two computers via the phone line. Telecommunications software is used to control a modem.

THERMAL TRANSFER

Thermal transfer printers burn images onto specially treated paper. This is a non-impact dot matrix printer.

TOUCH SCREEN

Some monitors have sensors that allow the monitor to tell the computer where the screen is being touched.

TRACK

A region on the surface of a disk which is used to store information. Tracks are used to break the surface of a disk up into manageable, addressable regions. See Figure 82 and the discussion of a disk.

USER

The person using the computer system.

VGA (Video Graphics Array)

An enhancement over EGA. It allows several more colors than EGA and better control over these colors. It also has a higher potential resolution than EGA.

VOLATILE

Refers to information that is lost when the computer is shut off. RAM is volatile memory since any information in RAM is lost when the computer is shut off.

WORD PROCESSING

Software which allows the user to use a computer instead of a typewriter to create memos, letters and other forms of correspondence.

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