Bits, Bytes, and Packets

Bit: (Binary Digit):

The smallest unit of memory. Can take on one of two values (0 or 1). (All data in a computer is represented as a pattern of bits.)

Byte:

A group of 8 bits. (Memory is measured by the number of bytes it contains.)

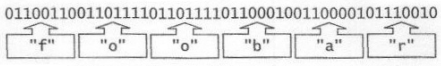
ASCII Code (Unicode):

A standardized scheme for representing characters in patterns of 7 bits. (There are 2^7 = 128 ascii patterns.)

ASCII Character Codes

code	char	code	char	code	char
00100000	space	01000000	@	01100000	'
00100001	!	01000001	A	01100001	a
00100010	"	01000010	B	01100010	b
00100011	#	01000011	C	01100011	c
00100100	$	01000100	D	01100100	d
00100101	%	01000101	E	01100101	e
00100110	&	01000110	F	01100110	f
00100111	'	01000111	G	01100111	g
00101000	(	01001000	H	01101000	h
00101001	)	01001001	I	01101001	i
00101010	*	01001010	J	01101010	j
00101011	+	01001011	K	01101011	k
00101100	,	01001100	L	01101100	l
00101101	-	01001101	M	01101101	m
00101110	.	01001110	N	01101110	n
00101111	/	01001111	O	01101111	o
00110000	0	01010000	P	01110000	p
00110001	1	01010001	Q	01110001	q
00110010	2	01010010	R	01110010	r
00110011	3	01010011	S	01110011	s
00110100	4	01010100	T	01110100	t
00110101	5	01010101	U	01110101	u
00110110	6	01010110	V	01110110	v
00110111	7	01010111	W	01110111	w
00111000	8	01011000	X	01111000	x
00111001	9	01011001	Y	01111001	y
00111010	:	01011010	Z	01111010	z
00111011	;	01011011	[	01111011	{
00111100	<	01011100	\	01111100 |	
00111101	=	01011101	]	01111101	}
00111110	>	01011110	^	01111110	~
00111111	?	01011111		01111111	delete

The ASCII character set.



Representing a string as a sequence of ASCII codes.

ASCII File (or text file):

A document that contains plain text only (e.g.,a Notepad file). Each character of text is stored as a single byte using the ASCII code.

Binary File:

Files that contain data that is not plain text (e.g., word processing files, executable files, graphics files).

File Size:

Numbers of bytes in the file.

1KB (kilobyte) =	2^{10} bytes = 1024 bytes
1MB (megabyte) =	2^{20} bytes = 1024KB
1GB (gigabyte) =	2^{30} bytes = 1024MB
1TB (terabyte) =	2^{40} bytes = 1024GB

File Compression:

Used to reduce the storage requirements for large files (e.g., graphics, music, and video files).
Sample techniques: jpeg, mp3, mpeg, LZW, MH, ...

Speed of Data Transmission:

Data are transmitted at speeds measured in **bps** (bits per second).

Typical Speeds:

Modem -	33.6Kbps, 56Kbps
ISDN -	64Kbps, 2 x 64 Kbps
DSL -	
Cable Modem -	