CODING CHARTS

As discussed in Chapter 2 of this text, coding systems for text-based data include ASCII, EBCDIC, and Unicode. ■

ASCII and EBCDIC

Figure R-9 provides a chart listing the 8-digit ASCII and EBCDIC representations (in binary) for most of the symbols found on a typical keyboard.

FIGURE R-9
ASCII and EBCDIC binary codes for typical keyboard symbols.

SYMBOL	ASCII	EBCDIC
A	0100 0001	1100 0001
B	0100 0010	1100 0010
C	0100 0011	1100 0011
D	0100 0100	1100 0100
E	0100 0101	1100 0101
F	0100 0110	1100 0110
G	0100 0111	1100 0111
H	0100 1000	1100 1000
I	0100 1001	1100 1001
J	0100 1010	1101 0001
K	0100 1011	1101 0010
L	0100 1100	1101 0011
M	0100 1101	1101 0100
N	0100 1110	1101 0101
O	0100 1111	1101 0110
P	0101 0000	1101 0111
Q	0101 0001	1101 1000
R	0101 0010	1101 1001
S	0101 0011	1110 0010
T	0101 0100	1110 0011
U	0101 0101	1110 0100
V	0101 0110	1110 0101
W	0101 0111	1110 0110
X	0101 1000	1110 0111
Y	0101 1001	1110 1000
Z	0101 1010	1110 1001
a	0110 0001	1000 0001
b	0110 0010	1000 0010
c	0110 0011	1000 0011
d	0110 0100	1000 0100
e	0110 0101	1000 0101
f	0110 0110	1000 0110
g	0110 0111	1000 0111
h	0110 1000	1000 1000
i	0110 1001	1000 1001
j	0110 1010	1001 0001
k	0110 1011	1001 0010
l	0110 1100	1001 0011
m	0110 1101	1001 0100
n	0110 1110	1001 0101
o	0110 1111	1001 0110
p	0111 0000	1001 0111
q	0111 0001	1001 1000
r	0111 0010	1001 1001
s	0111 0011	1010 0010
t	0111 0100	1010 0011
u	0111 0101	1010 0100
v	0111 0110	1010 0101
w	0111 0111	1010 0110
x	0111 1000	1010 0111
y	0111 1001	1010 1000
z	0111 1010	1010 1001
0	0011 0000	1111 0000
1	0011 0001	1111 0001
2	0011 0010	1111 0010
3	0011 0011	1111 0011
4	0011 0100	1111 0100
5	0011 0101	1111 0101
6	0011 0110	1111 0110
7	0011 0111	1111 0111
8	0011 1000	1111 1000
9	0011 1001	1111 1001
(	0010 1000	0100 1101
)	0010 1001	0101 1101
/	0010 1111	0110 0001
-	0010 1101	0110 0000
*	0010 1010	0101 1100
+	0010 1011	0100 1110
,	0010 1100	0110 1011
.	0010 1110	0100 1011
:	0011 1010	0111 1010
;	0011 1011	0101 1110
&	0010 0110	0101 0000
\	0101 1100	1110 0000
$	0010 0100	0101 1011
%	0010 0101	0110 1100
=	0011 1101	0111 1110
>	0011 1110	0110 1110
<	0011 1100	0100 1100
!	0010 0001	0101 1010
|	0111 1100	0110 1010
?	0011 1111	0110 1111
@	0100 0000	0111 1100
_	0101 1111	0110 1101
`	0110 0000	1011 1001
{	0111 1011	1100 0000
}	0111 1101	1101 0000
~	0111 1110	1010 0001
[	0101 1011	0100 1010
]	0101 1101	0101 1010

A 0041	N 004E	a 0061	n 006E	0 0030	{ 007B	* 002A	■ 25A0	অ 0985
B 0042	O 004F	b 0062	o 006F	1 0031	| 007C	+ 002B	□ 25A1	গ 0997
C 0043	P 0050	c 0063	p 0070	2 0032	} 007D	, 002C	▲ 25B2	ে 09C7
D 0044	Q 0051	d 0064	q 0071	3 0033	~ 007E	- 002D	℅ 2105	৯ 09F6
E 0045	R 0052	e 0065	r 0072	4 0034	! 0021	. 002E	₨ 211E	ঀ 0685
F 0046	S 0053	f 0066	s 0073	5 0035	" 0022	/ 002F	⅓ 2153	঴ 06B4
G 0047	T 0054	g 0067	t 0074	6 0036	# 0023	£ 20A4	⅔ 2154	ں 06AA
H 0048	U 0055	h 0068	u 0075	7 0037	$ 0024	∑ 2211	♕ 2655	α 03B1
I 0049	V 0056	i 0069	v 0076	8 0038	% 0025	∅ 2205	☂ 2602	β 03B2
J 004A	W 0057	j 006A	w 0077	9 0039	& 0026	√ 221A	❒ 2750	Δ 0394
K 004B	X 0058	k 006B	x 0078	[005B	' 0027	∞ 221E	✵ 2742	ϕ 03A6
L 004C	Y 0059	l 006C	y 0079	\ 005C	(0028	≤ 2264	➲ 27B2	Ω 03A9
M 004D	Z 005A	m 006D	z 007A	] 005D	) 0029	≥ 2265	♥ 2665	Ÿ 03AB

FIGURE R-10
Selected Unicode codes.

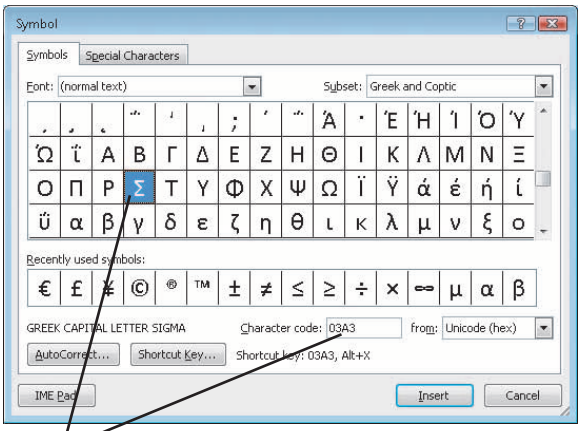
Unicode

Since consistent worldwide representation of symbols is increasingly needed today, use of Unicode is growing rapidly. Unicode can be used to represent every written language, as well as a variety of other symbols. Unicode codes are typically listed in hexadecimal notation—a sampling of Unicode is shown in Figure R-10.

The capability to display characters and other symbols using Unicode coding is incorporated into many programs. For instance, when the Symbol dialog box is opened using the Insert menu in Microsoft Office Word, the Unicode representation (as well as the corresponding ASCII code in either decimal or hexadecimal representation) can be viewed (see Figure R-11). Some programs allow you to enter a Unicode symbol using its Unicode hexadecimal value. For instance, in Microsoft Office programs you can use the Alt+X command when the insertion point is just to the right of a Unicode hex value to convert that hex value into the corresponding symbol. For example, the keystrokes

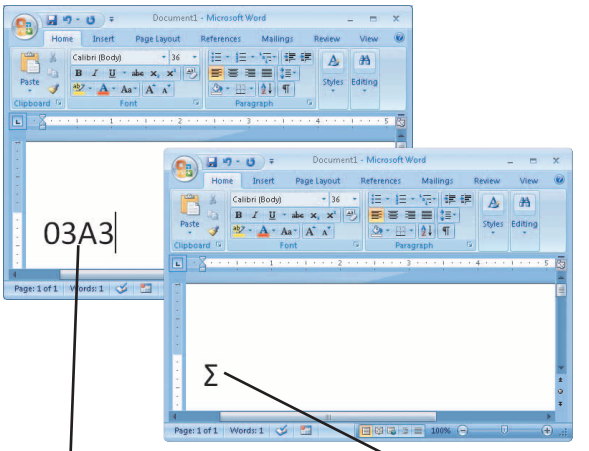
2264Alt+X

result in the symbol corresponding to the Unicode code 2264 (the less than or equal sign ″) being inserted into the document; entering 03A3 and then pressing Alt+X inserts the symbol shown in the Word screen in Figure R-11.



Unicode representation for Greek capital letter sigma ∑ symbol.

UNICODE REPRESENTATION
The Symbol dialog box shown here lists the Unicode representation of each symbol as it is selected. If preferred, the ASCII representation can be displayed.



1. Type code, and then press Alt+X.
2. The corresponding symbol appears.

FIGURE R-11
Using Unicode.

INSERTING SYMBOLS USING UNICODE
In Microsoft Office programs, typing the hexadecimal Unicode code for a symbol and then pressing Alt+X displays the corresponding symbol.