

# The ASCII Scheme of Character Encoding

ASCII is short for *American Standard Code for Information Interchange*, a standard mapping characters to 7 bit codes, that is, to numbers ranging from 0 to 127 decimal, or *7F* hexadecimal, according to the following table. Code *20* hex represents the space.

<i>hex</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>
<i>0x</i>	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
<i>1x</i>	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
<i>2x</i>	␣	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
<i>3x</i>	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
<i>4x</i>	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
<i>5x</i>	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
<i>6x</i>	‘	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
<i>7x</i>	p	q	r	s	t	u	v	w	x	y	z	{		}	~	DEL

The first 32 codes are assigned to functions rather than characters. For example, HT means “move to next tab stop.” Many of these *control codes* are for specific applications and rarely used nowadays. Anyway, here is what they mean and their C escape sequences:

## Transmission Control

<i>01</i>	SOH	Start of Heading
<i>02</i>	STX	Start of Text
<i>03</i>	ETX	End of Text
<i>04</i>	EOT	End of Transmission
<i>05</i>	ENQ	Enquiry (goes with ACK)
<i>06</i>	ACK	Acknowledge
<i>10</i>	DLE	Data Link Escape
<i>15</i>	NAK	Negative Acknowledge
<i>16</i>	SYN	Synchronous Idle
<i>17</i>	ETB	End Transmission Block

## Device Control

<i>11</i>	DC1	XON (okay to send)
<i>12</i>	DC2	Device Control 2
<i>13</i>	DC3	XOFF (pause listings)
<i>14</i>	DC4	Device Control 4

## Code Extensions

<i>0E</i>	SO	Shift Out (use alternate code)
<i>0F</i>	SI	Shift In (resume default code)
<i>1B</i>	ESC	Escape

## Formatting

<i>08</i>	BS	Backspace	\b
<i>09</i>	HT	Horizontal Tabulation	\t
<i>0A</i>	LF	Line Feed	\n
<i>0B</i>	VT	Vertical Tabulation	\v
<i>0C</i>	FF	Form Feed (page eject)	\f
<i>0D</i>	CR	Carriage Return	\r

## Information Separation

<i>1C</i>	FS	File Separator
<i>1D</i>	GS	Group Separator
<i>1E</i>	RS	Record Separator
<i>1F</i>	US	Unit Separator

## Others

<i>00</i>	NUL	Null character	\0
<i>07</i>	BEL	Bell (audible alert)	\a
<i>18</i>	CAN	Cancel line	
<i>19</i>	EM	End of Medium	
<i>1A</i>	SUB	Substitute	