

ASCII Character Set

The information on this page is in four parts including general ASCII information, conversions of the non-printable control characters, conversions of the printable ASCII characters, and a keyboard input for printable ASCII character conversion.

General Information

Pronounced as-key, ASCII is a sequential formula for representing English characters as numbers, with each letter assigned a number from 0 to 127; however, not all of those are really printable characters. An acronym for American Standard Code for Information Interchange, this is the most common code for text on computers. In common usage, ASCII means a text [file](#) that doesn't include any formatting. In most programs, the "Save As Text" option will create an ASCII file in contrast to a specially formatted file or binary file. An ASCII file is a character by character save process. For example, the ASCII code for an upper case A is decimal 65; the lower case a adds decimal 32 to that and is 97. Most computers use ASCII codes to represent, display or print text, which makes it possible to transfer data from one computer to another. The meaning of the acronym name in itself is misleading as there really is no standard, just a strong suggestion. Many companies have taken generous, liberal and self-enhancing liberties in making modifications to suit themselves, IBM and Microsoft being at the top of the list.

Text files stored in ASCII format are sometimes called text files or ASCII files; they often have the file extensions .TXT, .txt, .ASC or .asc. Text editors and word processors are usually capable of storing data in ASCII format, although ASCII format is not always the default storage format. Most data files, particularly if they contain numeric data, are not stored in ASCII format unless there is a need for easy and quick interchange with several types of systems that access that data. Executable programs are not normally stored in standard ASCII format, though there are certain exceptions such as executable programs running under interpreters.

The standard ASCII character set uses only 7 bits of the 8 bit byte for each character. There are several larger character sets that use all 8 bits of the byte, which gives them an 128 additional characters in the set. The extra characters are used to represent characters not used in the English language, graphics characters or symbols, and mathematical representations or symbols. Several companies and organizations have proposed extensions for these 128 characters; none have made any effort to work together for standards. The DOS operating system uses a superset of ASCII called the ASCII extended set or PC ASCII. A more universal standard is the ISO Latin 1 set of characters used by many current operating systems and most current generation browsers. Typical non-conformer IBM (and several other mainframe makers), use another code set called [EBCDIC](#).

ASCII Control Character Information

ASCII control characters are actually commands for the terminal, monitor, computer, I/O devices, printer or other peripherals to do something. The first 32 values are non-printing control characters, such as Carriage Return (decimal value 13) and Line Feed (decimal value 10). You generate these characters on the keyboard by holding down the Control key while you strike another key. For example, BEL (Bell) is value decimal 7, Control and the letter G at the same time, often shown in documents as ^G. Notice that 7 is 64 less than the value of G (71); the Control key subtracts 64 from the value of the keys that it modifies. It does this by setting bit 6 (the 7th bit in a 0-7 indicated 8 bit byte) to a space. These characters are also capable of being sent to the device by a software sequence, most often by a program. They are usually sent as a string of characters following an attention character, usually ESCape, but not always. This string of characters, or the equivalent numeric representation of each character, is usually done in hexadecimal or decimal, sometimes in octal on older minicomputers, but virtually never (though possible) in binary. Because of that, these software issued control characters or sequences are often termed ESCape sequences.

ASCII Control Characters

The following table lists ASCII Control codes in octal, decimal, hexadecimal and their corresponding Control-key combinations.

Char	Oct	Dec	Hex	Control-Key	Control Action
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NUL	0	0	0	^@	NUL character
SOH	1	1	1	^A	Start Of Heading
STX	2	2	2	^B	Start of TeXt
ETX	3	3	3	^C	End of TeXt
EOT	4	4	4	^D	End Of Transmission
ENQ	5	5	5	^E	ENQuiry
ACK	6	6	6	^F	ACkNOWLEDge
BEL	7	7	7	^G	BELl, rings terminal bell
BS	10	8	8	^H	BackSpace (non-destructive)
HT	11	9	9	^I	Horizontal Tab (move to next tab position)
LF	12	10	a	^J	Line Feed
VT	13	11	b	^K	Vertical Tab
FF	14	12	c	^L	Form Feed
CR	15	13	d	^M	Carriage Return
SO	16	14	e	^N	Shift Out
SI	17	15	f	^O	Shift In
DLE	20	16	10	^P	Data Link Escape
DC1	21	17	11	^Q	Device Control 1, normally XON
DC2	22	18	12	^R	Device Control 2
DC3	23	19	13	^S	Device Control 3, normally XOFF
DC4	24	20	14	^T	Device Control 4
NAK	25	21	15	^U	Negative AcKnowledge
SYN	26	22	16	^V	SYNchronous idle
ETB	27	23	17	^W	End Transmission Block
CAN	30	24	18	^X	CANcel line
EM	31	25	19	^Y	End of Medium
SUB	32	26	1a	^Z	SUBstitute
ESC	33	27	1b	^[ESCape
FS	34	28	1c	^\	File Separator
GS	35	29	1d	^]	Group Separator
RS	36	30	1e	^^	Record Separator
US	37	31	1f	^_	Unit Separator

Printing Characters

Char	Octal	Dec	Hex	Description
SP	40	32	20	Space
!	41	33	21	Exclamation mark
"	42	34	22	Quotation mark (" in HTML)
#	43	35	23	Cross hatch (number sign)
\$	44	36	24	Dollar sign
%	45	37	25	Percent sign
&	46	38	26	Ampersand

`	47	39	27	Closing single quote (apostrophe)
(50	40	28	Opening parentheses
)	51	41	29	Closing parentheses
*	52	42	2a	Asterisk (star, multiply)
+	53	43	2b	Plus
,	54	44	2c	Comma
-	55	45	2d	Hyphen, dash, minus
.	56	46	2e	Period
/	57	47	2f	Slash (forward or divide)
0	60	48	30	Zero
1	61	49	31	One
2	62	50	32	Two
3	63	51	33	Three
4	64	52	34	Four
5	65	53	35	Five
6	66	54	36	Six
7	67	55	37	Seven
8	70	56	38	Eight
9	71	57	39	Nine
:	72	58	3a	Colon
;	73	59	3b	Semicolon
<	74	60	3c	Less than sign (< in HTML)
=	75	61	3d	Equals sign
>	76	62	3e	Greater than sign (> in HTML)
?	77	63	3f	Question mark
@	100	64	40	At-sign
A	101	65	41	Upper case A
B	102	66	42	Upper case B
C	103	67	43	Upper case C
D	104	68	44	Upper case D
E	105	69	45	Upper case E
F	106	70	46	Upper case F
G	107	71	47	Upper case G
H	110	72	48	Upper case H
I	111	73	49	Upper case I
J	112	74	4a	Upper case J
K	113	75	4b	Upper case K
L	114	76	4c	Upper case L
M	115	77	4d	Upper case M
N	116	78	4e	Upper case N
O	117	79	4f	Upper case O
P	120	80	50	Upper case P
Q	121	81	51	Upper case Q

R	122	82	52	Upper case R
S	123	83	53	Upper case S
T	124	84	54	Upper case T
U	125	85	55	Upper case U
V	126	86	56	Upper case V
W	127	87	57	Upper case W
X	130	88	58	Upper case X
Y	131	89	59	Upper case Y
Z	132	90	5a	Upper case Z
[133	91	5b	Opening square bracket
\	134	92	5c	Backslash (Reverse slant)
]	135	93	5d	Closing square bracket
^	136	94	5e	Caret (Circumflex)
_	137	95	5f	Underscore
`	140	96	60	Opening single quote
a	141	97	61	Lower case a
b	142	98	62	Lower case b
c	143	99	63	Lower case c
d	144	100	64	Lower case d
e	145	101	65	Lower case e
f	146	102	66	Lower case f
g	147	103	67	Lower case g
h	150	104	68	Lower case h
i	151	105	69	Lower case i
j	152	106	6a	Lower case j
k	153	107	6b	Lower case k
l	154	108	6c	Lower case l
m	155	109	6d	Lower case m
n	156	110	6e	Lower case n
o	157	111	6f	Lower case o
p	160	112	70	Lower case p
q	161	113	71	Lower case q
r	162	114	72	Lower case r
s	163	115	73	Lower case s
t	164	116	74	Lower case t
u	165	117	75	Lower case u
v	166	118	76	Lower case v
w	167	119	77	Lower case w
x	170	120	78	Lower case x
y	171	121	79	Lower case y
z	172	122	7a	Lower case z
{	173	123	7b	Opening curly brace
	174	124	7c	Vertical line

}	175	125	7d	Closing curly brace
~	176	126	7e	Tilde (approximate)
DEL	177	127	7f	Delete (rubout), cross-hatch box

This [converter](#) requires the use of [Javascript](#) enabled and capable browsers.

Input one keyboard character:

Conversion Results To Base


ASCII To Octal Conversion

ASCII To Decimal Conversion

ASCII To Hex Conversion

ASCII To Binary Conversion

Version 6.2.2

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