



# The ASCII Character Set

The American Standard Code for Information Interchange or ASCII assigns values between 0 and 255 for upper and lower case letters, numeric digits, punctuation marks and other symbols. ASCII characters can be split into the following sections:

- ❑ 0 – 31 Control codes
- ❑ 32 – 127 Standard, implementation-independent characters
- ❑ 128 – 255 Special symbols, international character sets – generally, non-standard characters.

## Control Codes : ASCII Characters 0 - 31

The following table lists and describes the first 32 ASCII characters, often referred to as control codes. The columns show the decimal and hexadecimal ASCII values for each code along with their abbreviated and full names. Descriptions are given to those most in use today.

Decimal	Octal	Hexadecimal	Code	Description
000	000	00	NUL	Null
001	001	01	SOH	Start Of Heading
002	002	02	STX	Start of TeXt
003	003	03	ETX	End of TeXt
004	004	04	EOT	End Of Transmission
005	005	05	ENQ	ENQuiry
006	006	06	ACK	ACKnowledge

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Decimal	Octal	Hexadecimal	Code	Description
029	035	1D	GS	Group Separator
030	036	1E	RS	Record Separator
031	037	1F	US	Unit Separator

## The Standard ASCII Characters : 32 - 127

ASCII Characters 32 - 127 are the standard, implementation-independent alphanumeric characters we work with every day. The tables below show the characters along with both their decimal and hexadecimal ASCII values.

### Characters 32 - 64

The first table, which contains characters 32 - 64, contains the majority of the standard symbolic characters and the numbers from zero to nine.

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
032	040	20	Space	049	061	31	1
033	041	21	!	050	062	32	2
034	042	22	"	051	063	33	3
035	043	23	#	052	064	34	4
036	044	24	\$	053	065	35	5
037	045	25	%	054	066	36	6
038	046	26	&	055	067	37	7
039	047	27	'	056	070	38	8
040	050	28	(	057	071	39	9
041	051	29	)	058	072	3A	:
042	052	2A	*	059	073	3B	;
043	053	2B	+	060	074	3C	<
044	054	2C	,	061	075	3D	=
045	055	2D	-	062	076	3E	>
046	056	2E	.	063	077	3F	?
047	057	2F	/	064	100	40	@
048	060	30	0				

Decimal	Octal	Hexadecimal	Code	Description
007	007	07	BEL	BELL. Caused teletype machines to ring a bell. Causes a beep in many common terminals and terminal emulation programs.
008	010	08	BS	BackSpace. Moves the cursor move backwards (left) one space.
009	011	09	HT	Horizontal Tab. Moves the cursor right to the next tab stop. The spacing of tab stops is dependent on the output device, but is often either 8 or 10 characters wide.
010	012	0A	LF	Line Feed. Moves the cursor to a new line. On Unix systems, moves to a new line AND all the way to the left.
011	013	0B	VT	Vertical Tab
012	014	0C	FF	Form Feed. Advances paper to the top of the next page (if the output device is a printer).
013	015	0D	CR	Carriage Return. Moves the cursor all the way to the left, but does not advance to the next line.
014	016	0E	SO	Shift Out
015	017	0F	SI	Shift In
016	020	10	DLE	Data Link Escape
017	021	11	DC1	Device Control 1
018	022	12	DC2	Device Control 2
019	023	13	DC3	Device Control 3
020	024	14	DC4	Device Control 4
021	025	15	NAK	Negative AcKnowledge
022	026	16	SYN	SYNchronous idle
023	027	17	ETB	End of Transmission Block
024	030	18	CAN	CANcel
025	031	19	EM	End of Medium
026	032	1A	SUB	SUBstitute
027	033	1B	ESC	ESCape
028	034	1C	FS	File Separator

**Characters 65 - 127**

The second table, which contains characters 65 - 127, contains the standard Latin alphabet characters both lower and upper case, separated only by a few characters at 91 - 96 and 123 - 127.

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
065	101	41	A	097	141	61	a
066	102	42	B	098	142	62	b
067	103	43	C	099	143	63	c
068	104	44	D	100	144	64	d
069	105	45	E	101	145	65	e
070	106	46	F	102	146	66	f
071	107	47	G	103	147	67	g
072	110	48	H	104	150	68	h
073	111	49	I	105	151	69	i
074	112	4A	J	106	152	6A	j
075	113	4B	K	107	153	6B	k
076	114	4C	L	108	154	6C	l
077	115	4D	M	109	155	6D	m
078	116	4E	N	110	156	6E	n
079	117	4F	O	111	157	6F	o
080	120	50	P	112	160	70	p
081	121	51	Q	113	161	71	q
082	122	52	R	114	162	72	r
083	123	53	S	115	163	73	s
084	124	54	T	116	164	74	t
085	125	55	U	117	165	75	u
086	126	56	V	118	166	76	v
087	127	57	W	119	167	77	w
088	130	58	X	120	170	78	x
089	131	59	Y	121	171	79	y
090	132	5A	Z	122	172	7A	z

ASCII values

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
091	133	5B	[	123	173	7B	{
092	134	5C	\	124	174	7C	
093	135	5D	]	125	175	7D	}
094	136	5E	^	126	176	7E	~
095	137	5F	_	127	177	7F	delete
096	140	60	'				

## The Non-Standard ASCII Characters : 128 - 255

The second half of the ASCII table holds the non-standard extension set of characters which may vary depending which computer system you may be using. One common – but in no way definitive – example of this extended set is as follows.

### Characters 128 - 191

This first table contains characters 128 - 191, abstract symbols that appear in text from time to time.

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
128	200	80	•	160	240	A0	non-breaking space
129	201	81	•	161	241	A1	ı
130	202	82	,	162	242	A2	¢
131	203	83	f	163	243	A3	£
132	204	84	„	164	244	A4	¤
133	205	85	...	165	245	A5	¥
134	206	86	†	166	246	A6	ı
135	207	87	‡	167	247	A7	§
136	210	88	^	168	250	A8	¨
137	211	89	‰	169	251	A9	©
138	212	8A	Š	170	252	AA	ª
139	213	8B	<	171	253	AB	«

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Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
140	214	8C	Œ	172	254	AC	¬
141	215	8D	•	173	255	AD	-
142	216	8E	Ž	174	256	AE	®
143	217	8F	•	175	257	AF	-
144	220	90	•	176	260	B0	°
145	221	91	'	177	261	B1	±
146	222	92	'	178	262	B2	²
147	223	93	"	179	263	B3	³
148	224	94	•	180	264	B4	´
149	225	95	•	181	265	B5	µ
150	226	96	–	182	266	B6	¶
151	227	97	–	183	267	B7	·
152	230	98	˘	184	270	B8	¸
153	231	99	™	185	271	B9	¹
154	232	9A	š	186	272	BA	º
155	233	9B	›	187	273	BB	»
156	234	9C	œ	188	274	BC	¼
157	235	9D	•	189	275	BD	½
158	236	9E	ÿ	190	276	BE	¾
159	237	9F	ÿ	191	277	BF	¿

### Characters 192 - 255

The second table contains characters 192 - 255, variously accented alphabetical characters.

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
192	300	C0	À	224	340	E0	à
193	301	C1	Á	225	341	E1	á
194	302	C2	Â	226	342	E2	â
195	303	C3	Ã	227	343	E3	ã
196	304	C4	Ä	228	344	E4	ä

Decimal	Octal	Hexadecimal	Character	Decimal	Octal	Hexadecimal	Character
197	305	C5	Å	229	345	E5	å
198	306	C6	Æ	230	346	E6	æ
199	307	C7	Ç	231	347	E7	ç
200	310	C8	È	232	350	E8	è
201	311	C9	É	233	351	E9	é
202	312	CA	Ê	234	352	EA	ê
203	313	CB	Ë	235	353	EB	ë
204	314	CC	Ì	236	354	EC	ì
205	315	CD	Í	237	355	ED	í
206	316	CE	Î	238	356	EE	î
207	317	CF	Ï	239	357	EF	ï
208	320	D0	Ð	240	360	F0	ð
209	321	D1	Ñ	241	361	F1	ñ
210	322	D2	Ò	242	362	F2	ò
211	323	D3	Ó	243	363	F3	ó
212	324	D4	Ô	244	364	F4	ô
213	325	D5	Ö	245	365	F5	ö
214	326	D6	Ö	246	366	F6	ö
215	327	D7	×	247	367	F7	÷
216	330	D8	Ø	248	370	F8	ø
217	331	D9	Ù	249	371	F9	ù
218	332	DA	Ú	250	372	FA	ú
219	333	DB	Û	251	373	FB	û
220	334	DC	Ü	252	374	FC	ü
221	335	DD	Ý	253	375	FD	ý
222	336	DE	Þ	254	376	FE	þ
223	337	DF	ß	255	377	FF	

ASCII values