

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.

| hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0x | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1x | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2x | ␣ | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4x | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5x | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6x | ' | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7x | 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 very specific applications and are rarely used nowadays. Anyway, here is what they mean:

Transmission Control

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

Device Control

| | | |
|----|-----|-----------------------|
| 11 | DC1 | XON (okay to send) |
| 12 | DC2 | Device Control 2 |
| 13 | DC3 | XOFF (pause listings) |
| 14 | DC4 | Device Control 4 |

Code Extensions

| | | |
|----|-----|--------------------------------|
| 0E | SO | Shift Out (use alternate code) |
| 0F | SI | Shift In (resume default code) |
| 1B | ESC | Escape |

Formatting

| | | |
|----|----|------------------------|
| 08 | BS | Backspace |
| 09 | HT | Horizontal Tabulation |
| 0A | LF | Line Feed |
| 0B | VT | Vertical Tabulation |
| 0C | FF | Form Feed (page eject) |
| 0D | CR | Carriage Return |

Information Separation

| | | |
|----|----|------------------|
| 1C | FS | File Separator |
| 1D | GS | Group Separator |
| 1E | RS | Record Separator |
| 1F | US | Unit Separator |

Others

| | | |
|----|-----|----------------------|
| 00 | NUL | Null character |
| 07 | BEL | Bell (ring the bell) |
| 18 | CAN | Cancel line |
| 19 | EM | End of Medium |
| 1A | SUB | Substitute |