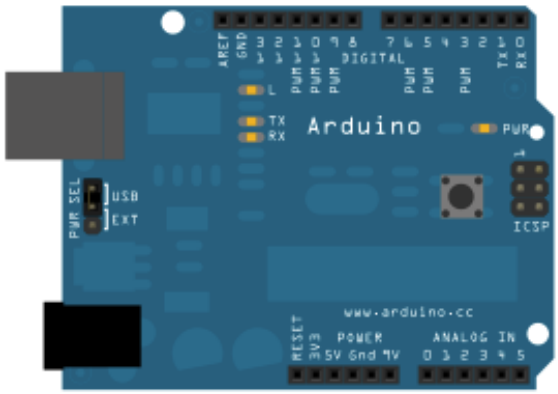
ASCII Table

This example demonstrates the advanced serial printing functions by generating on the serial monitor of the Arduino Software (IDE) a table of characters and their ASCII values in decimal, hexadecimal, octal, and binary. For more on ASCII, see asciitable.com (http://www.asciitable.com%20and%20http://en.wikipedia.org/wiki/ASCII)

Hardware Required

- Arduino or Genuino Board

Circuit



(//www.arduino.cc/en/uploads/Tutorial/Arduino_bb.png)

image developed using Fritzing (http://www.fritzing.org). For more circuit examples, see the Fritzing project page (http://fritzing.org/projects/)

None, but the board has to be connected to the computer through the serial port or the USB port.

Code

The sketch waits for a serial connection in the `setup()` then prints line by line the ASCII table up to the last printable character. When this is accomplished, it enters an endless loop in a while structure and nothing else happens. Closing and opening the serial monitor window of the Arduino Software (IDE) should reset the

```
/*
  ASCII table

  Prints out byte values in all possible formats:
  - as raw binary values
  - as ASCII-encoded decimal, hex, octal, and binary values

  For more on ASCII, see http://www.asciitable.com and
http://en.wikipedia.org/wiki/ASCII

  The circuit: No external hardware needed.

  created 2006
  by Nicholas Zambetti <http://www.zambetti.com>
  modified 9 Apr 2012
  by Tom Igoe

  This example code is in the public domain.

  http://www.arduino.cc/en/Tutorial/ASCIITable
*/

void setup() {
  //Initialize serial and wait for port to open:
  Serial.begin(9600);
  while (!Serial) {
    ; // wait for serial port to connect. Needed for native USB port only
  }

  // prints title with ending line break
  Serial.println("ASCII Table ~ Character Map");
}

// first visible ASCIIcharacter '!' is number 33:
int thisByte = 33;
// you can also write ASCII characters in single quotes.
// for example, '!' is the same as 33, so you could also use this:
// int thisByte = '!';

void loop() {
  // prints value unaltered, i.e. the raw binary version of the byte.
  // The Serial Monitor interprets all bytes as ASCII, so 33, the first number,
  // will show up as '!'
  Serial.write(thisByte);

  Serial.print(", dec: ");
  // prints value as string as an ASCII-encoded decimal (base 10).
  // Decimal is the default format for Serial.print() and Serial.println(),
  // so no modifier is needed:
  Serial.print(thisByte);
  // But you can declare the modifier for decimal if you want to.
  // this also works if you uncomment it:
```

```
    Serial.print(", hex: ");
    // prints value as string in hexadecimal (base 16):
    Serial.print(thisByte, HEX);

    Serial.print(", oct: ");
    // prints value as string in octal (base 8);
    Serial.print(thisByte, OCT);

    Serial.print(", bin: ");
    // prints value as string in binary (base 2) also prints ending line break:
    Serial.println(thisByte, BIN);

    // if printed last visible character '~' or 126, stop:
    if (thisByte == 126) {    // you could also use if (thisByte == '~') {
      // This loop loops forever and does nothing
      while (true) {
        continue;
      }
    }
    // go on to the next character
    thisByte++;
  }
```

[Get Code] (//www.arduino.cc/en/Tutorial/ASCIITable?action=sourceblock&num=1)

Output

```
ASCII Table ~ Character Map
!, dec: 33, hex: 21, oct: 41, bin: 100001
", dec: 34, hex: 22, oct: 42, bin: 100010
#, dec: 35, hex: 23, oct: 43, bin: 100011
$, dec: 36, hex: 24, oct: 44, bin: 100100
%, dec: 37, hex: 25, oct: 45, bin: 100101
&, dec: 38, hex: 26, oct: 46, bin: 100110
', dec: 39, hex: 27, oct: 47, bin: 100111
(, dec: 40, hex: 28, oct: 50, bin: 101000
), dec: 41, hex: 29, oct: 51, bin: 101001
*, dec: 42, hex: 2A, oct: 52, bin: 101010
+, dec: 43, hex: 2B, oct: 53, bin: 101011
,, dec: 44, hex: 2C, oct: 54, bin: 101100
-, dec: 45, hex: 2D, oct: 55, bin: 101101
., dec: 46, hex: 2E, oct: 56, bin: 101110
/, dec: 47, hex: 2F, oct: 57, bin: 101111
0, dec: 48, hex: 30, oct: 60, bin: 110000
1, dec: 49, hex: 31, oct: 61, bin: 110001
2, dec: 50, hex: 32, oct: 62, bin: 110010
3, dec: 51, hex: 33, oct: 63, bin: 110011
4, dec: 52, hex: 34, oct: 64, bin: 110100
5, dec: 53, hex: 35, oct: 65, bin: 110101
6, dec: 54, hex: 36, oct: 66, bin: 110110
7, dec: 55, hex: 37, oct: 67, bin: 110111
8, dec: 56, hex: 38, oct: 70, bin: 111000
9, dec: 57, hex: 39, oct: 71, bin: 111001
:, dec: 58, hex: 3A, oct: 72, bin: 111010
;, dec: 59, hex: 3B, oct: 73, bin: 111011
<, dec: 60, hex: 3C, oct: 74, bin: 111100
=, dec: 61, hex: 3D, oct: 75, bin: 111101
>, dec: 62, hex: 3E, oct: 76, bin: 111110
?, dec: 63, hex: 3F, oct: 77, bin: 111111
@, dec: 64, hex: 40, oct: 100, bin: 1000000
A, dec: 65, hex: 41, oct: 101, bin: 1000001
B, dec: 66, hex: 42, oct: 102, bin: 1000010
C, dec: 67, hex: 43, oct: 103, bin: 1000011
D, dec: 68, hex: 44, oct: 104, bin: 1000100
E, dec: 69, hex: 45, oct: 105, bin: 1000101


...
```

See Also

- increment, ++ (//www.arduino.cc/en/Reference/Increment)
- while (//www.arduino.cc/en/Reference/While)()
- serial (//www.arduino.cc/en/Reference/Serial)()

- Dimmer (//www.arduino.cc/en/Tutorial/Dimmer) - Move the mouse to change the brightness of an LED.
- Graph (//www.arduino.cc/en/Tutorial/Graph) - Send data to the computer and graph it in Processing.
- Midi (//www.arduino.cc/en/Tutorial/Midi) - Send MIDI note messages serially.
- MultiSerialMega (//www.arduino.cc/en/Tutorial/MultiSerialMega) - Use two of the serial ports available on the Arduino and Genuino Mega.
- PhysicalPixel (//www.arduino.cc/en/Tutorial/PhysicalPixel) - Turn a LED on and off by sending data to your board from Processing or Max/MSP.
- ReadASCIIString (//www.arduino.cc/en/Tutorial/ReadASCIIString) - Parse a comma-separated string of integers to fade an LED.
- SerialCallResponse (//www.arduino.cc/en/Tutorial/SerialCallResponse) - Send multiple variables using a call-and-response (handshaking) method.
- SerialCallResponseASCII (//www.arduino.cc/en/Tutorial/SerialCallResponseASCII) - Send multiple variables using a call-and-response (handshaking) method, and ASCII-encode the values before sending.
- SerialEvent (//www.arduino.cc/en/Tutorial/SerialEvent) - Demonstrates the use of SerialEvent().
- VirtualColorMixer (//www.arduino.cc/en/Tutorial/VirtualColorMixer) - Send multiple variables from Arduino to your computer and read them in Processing or Max/MSP.

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