

BINARY NUMERAL SYSTEM

LEVEL II

INTRODUCTION

In 1679, German mathematician Gottfried Leibniz published an article titled "Explanation of the Binary Arithmetic", in which he spoke of a numeral system consisting of only the digits 0 and 1, and how it could be useful. Today, the Binary Number System is the foundation for all modern electronics. Unlike our current number system, which uses the digits 0-9, the binary system only uses two digits, 0 and 1. Using these two digits, any number can be represented. This is extremely useful in computing, where memory consists of tiny elements that may only be in two states, on and off, or 0 and 1.

PRINCIPLES?

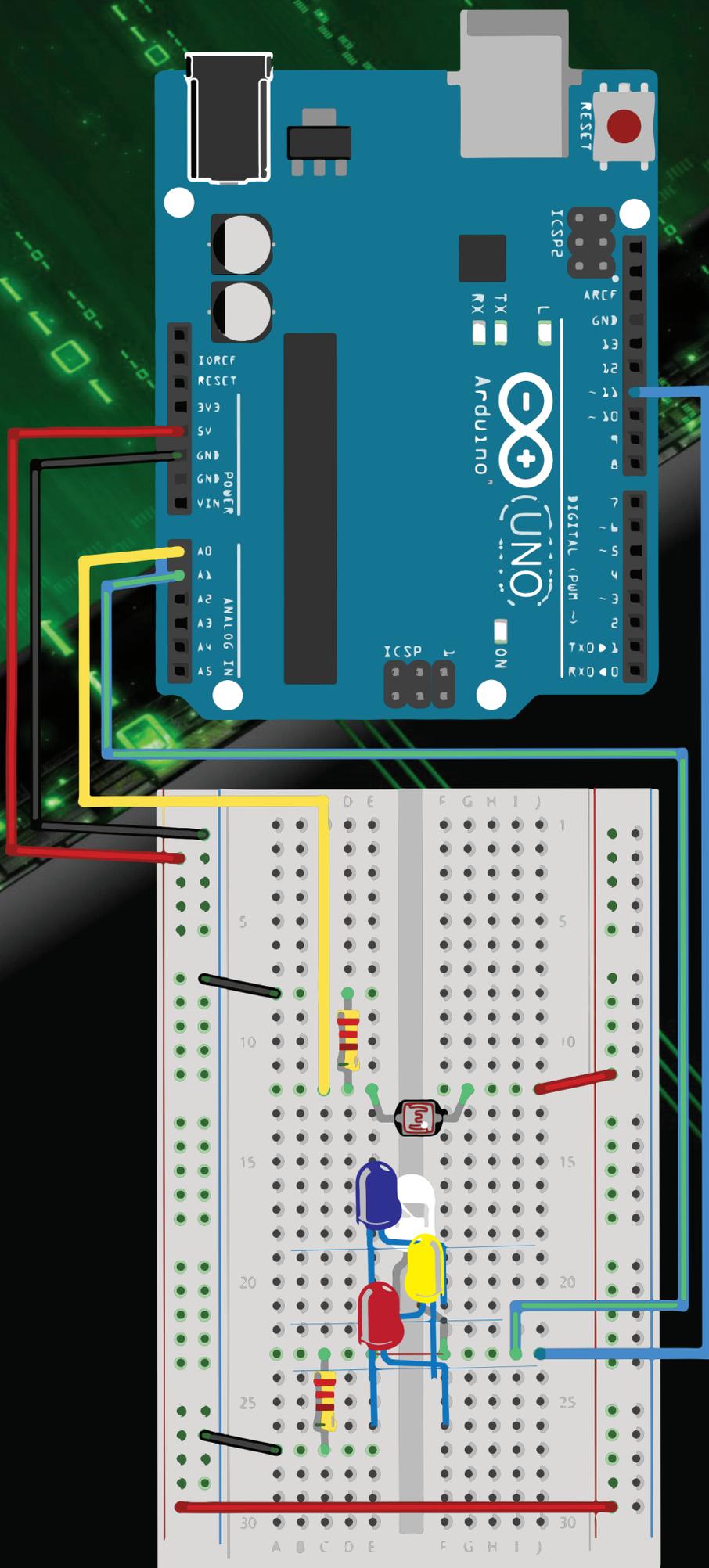
Now you may be wondering, how can we represent any number using just 0's and 1's? The answer is quite simple. Imagine a set of powers of two, starting from 2 raised to the zeroth power. A binary number such as 0101, can be read as powers of two. Starting from right to left, the first digit is simply 2 raised to the zeroth power, the second digit is 2 raised to the first power, the third digit is 2 squared, and the fourth digit is 2 cubed.

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BINARY COUNTERS

A binary counter uses LED's to represent binary numbers. Each LED that is glowing represents a 1, and each LED that is off represents a 0. In my binary counter, there are a total of 8 LED's, so any number from 1 through 255 can be displayed. For example, the number 40 is represented by the 6th and 4th LED's glowing. We can interpret this as 00101000 based on the state of the LED's. So the number 255 can be represented by all of the LED's glowing, or 11111111, and the number 1, can be displayed by only the first LED glowing, or 00000001.

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WEBSITE



VIDEO

