Binary Data

Converting To and From

What is Binary

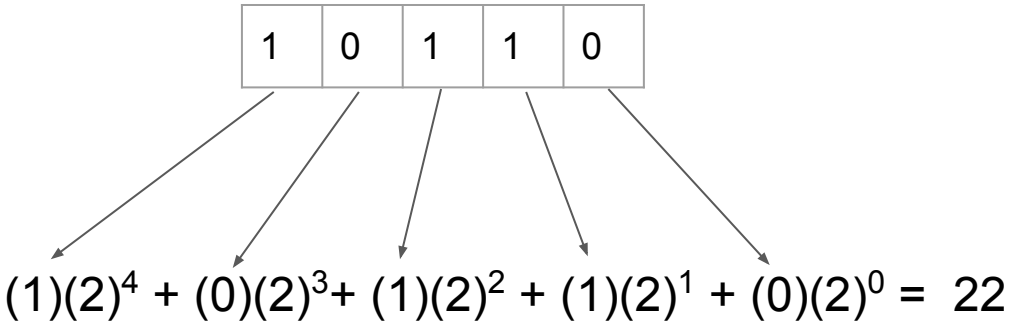
- Computers communicate in a binary fashion, meaning that ultimately all data is represented in zero’s and one’s, thus providing 2 possible digits to work with: (0, 1).

- This is a contrast to our daily lives, where we communicate using a decimal system - where everything is based on 10, thus providing 10 possible digits to work with: (0, 1, 2, 3, 4, 5, 6, 7, 8, 9). This is the origin of the word decimal.

How to Convert a Binary to a Decimal

Let’s take an example, we have a binary number here (10110) and we wish to change that to a decimal number.

- We first count the number of digits (there are 5).
- Then we apply the following process:



How to Convert a Decimal to a Binary

Let’s do the reverse process now and convert 22 to a binary representation. We are going to be a series of divisions and focusing on the remainder we get for each operation.

- 22 divided by 2 gives a remainder of **0**, and a quotient of 11.
- 11 divided by 2 gives a remainder of **1**, and a quotient of 5.
- 5 divided by 2 gives a remainder of **1**, and a quotient of 2.
- 2 divided by 2 gives a remainder of **0**, and a quotient of 1.
- 1 divided by 2 gives a remainder of **1**.

We put the remainders next to each other now: **0 1 1 0 1**, and then we reverse the order to get **1 0 1 1 0**.