INTRO TO

NUMBERS

Binary

Q. Why do computers use binary, and not just one state of on and off, like we usually have in our lives?

A. Because with binary, there are only two states.

Q. How exactly do computers process the data on our disks, The larger a file is, the more bits it is. With lightswitch, we are used to on and off, or 1 and 0. These are the binary digits, which are the basic units of data.

Computers, on the other hand, use a system called binary, which has only two digits, 0 and 1. They use a system which they call binary system, which means they only use combinations of these 10 digits.

Every number we could possibly imagine or make up of these 10 digits is called a decimal number.

When we count in everyday, we use something called the decimal system, which has ten digits.

The decimal system is based on powers of ten, starting from 10 to the power of 0, which is 1, and then 10 to the power of 1, which is 10, and so on. Each digit in a decimal number represents a power of ten, and the value of the digit is determined by its position in the number. For example, in the number 123, the digit 3 is in the ones place, meaning it represents 3 * 10^0 = 3, the digit 2 is in the tens place, meaning it represents 2 * 10^1 = 20, and the digit 1 is in the hundreds place, meaning it represents 1 * 10^2 = 100. Adding up these values gives us the total value of the number, which is 123.

The binary system is similar, but instead of powers of ten, it uses powers of two. The digits in a binary number represent powers of two, starting from 2^0, which is 1, and then 2^1, which is 2, and so on. Each digit in a binary number represents a power of two, and the value of the digit is determined by its position in the number. For example, in the binary number 1010, the digit 0 is in the ones place, meaning it represents 0 * 2^0 = 0, the digit 1 is in the twos place, meaning it represents 1 * 2^1 = 2, the digit 0 is in the fours place, meaning it represents 0 * 2^2 = 0, and the digit 1 is in the eights place, meaning it represents 1 * 2^3 = 8. Adding up these values gives us the total value of the number, which is 10.

The binary system is used in computers because it is easy to implement with electronic components, which can be in one of two states: on and off. These states can be represented by the digits 0 and 1 in binary.

Computers store and process data using binary digits, which are also called bits. A byte is a group of eight bits, and a kilobyte is 1024 bytes. Computers can store and process large amounts of data using these binary digits. The human brain also uses binary logic to process information. When we think about something, our brain processes the information using two states: yes and no, which can be represented by the digits 0 and 1 in binary.

What are the advantages of using binary over decimal? Binary is easier to process using electronic components because it uses only two states: on and off. This makes it more reliable and faster than using decimal, which uses ten states. Binary also uses less space than decimal because it only uses two digits, while decimal uses ten. This makes it more efficient for storage and transmission of data.