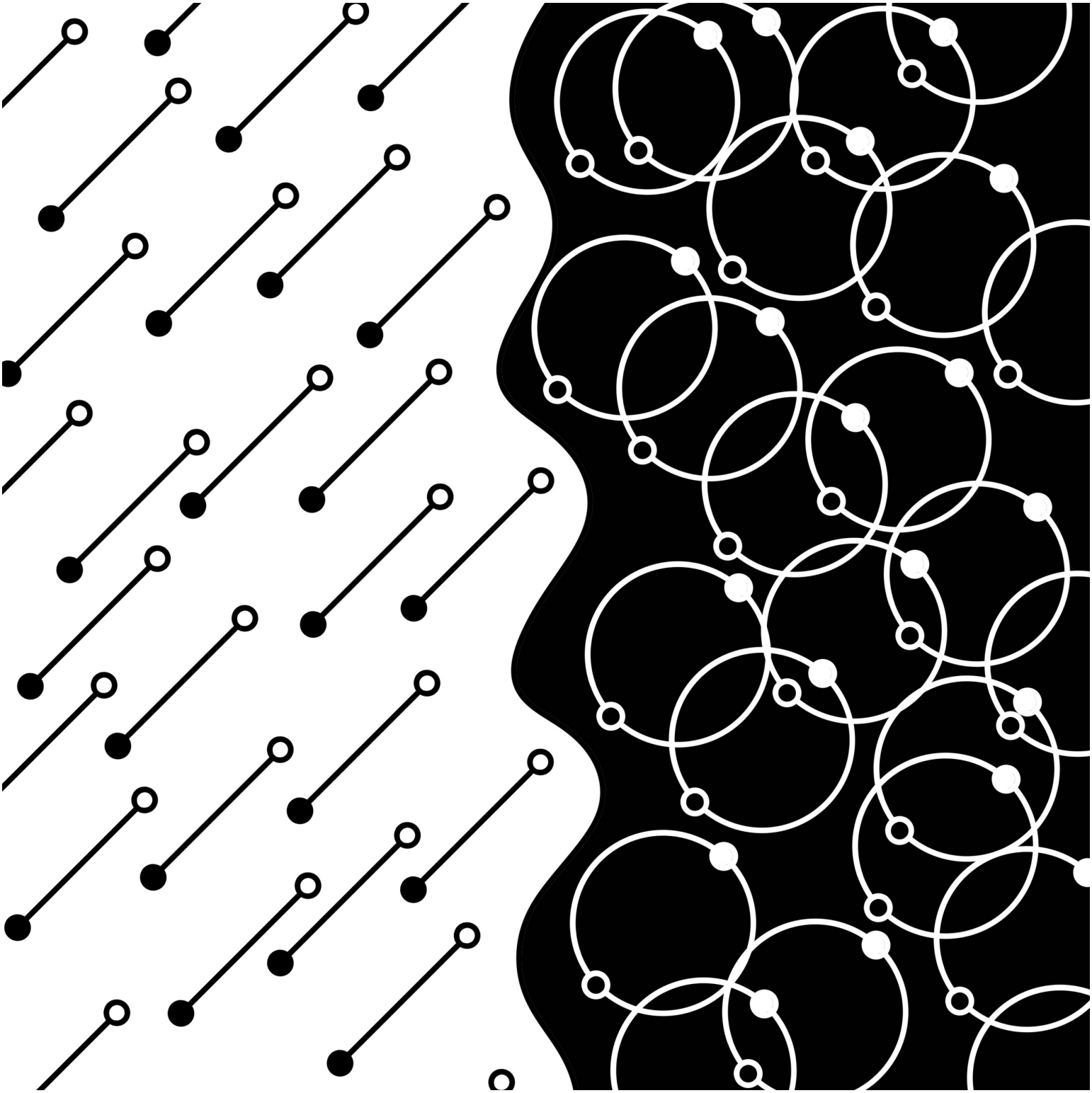

Bits vs. Qubits

The general concept of any computer is that you can use it to store and process information, called **data**. The smallest piece of information is a **bit**–something that is either on or off, like a light switch. When a computer writes data, it assigns a 0 or 1 to each bit, and the bit has that value until it is read. To store more data, bits can be put together in a string of 1's and 0's, which we call **binary code**. Computers are able to read the binary code bit by bit and translate the data into the visuals that we see in our internet browsers, video games, and so on.

The smallest piece of information in a quantum computer is a quantum bit, or a **qubit**. Qubits are different from bits because they can exist in a **quantum state** of both 0 and 1. However, once we read the value of the qubit, it collapses into either 0 or 1. The quantum state determines how **probable**, or likely, it is that you read a 0 or a 1. Multiple qubits can be entangled together, which increases the processing power of the quantum computer twofold: it exponentially increases the amount of data the qubits can hold and allows the quantum computer to simultaneously translate the data from each of the qubits.