

Understanding Bits vs Bytes

What is a Bit?

- A Bit (Binary Digit) is the smallest unit of data in computing.
- It can only be 0 or 1 (like a light switch - ON/OFF).

What is a Byte?

- A Byte is a group of 8 Bits.
- Example: 01100101 (8 individual bits = 1 Byte)

Why is this important?

- All files (text, image, audio) are stored in bytes.
- A character like 'A' is stored as a byte: ASCII value 65 = 01000001 in binary.

Comparison Table:

Unit	Symbol	Size
Bit	b	0 or 1
Byte	B	8 bits
Kilobyte	KB	1024 Bytes
Megabyte	MB	1024 KB
Gigabyte	GB	1024 MB

Kotlin Example:

```
val char = 'A'
val ascii = char.code // 65
println(Integer.toBinaryString(ascii)) // Output: 1000001
val padded = ascii.toString(2).padStart(8, '0') // 01000001
```