Binary

Recall: $6293_{10} = 6000 + 200 + 90 + 3$
$= 6 \times 10^3 + 2 \times 10^2 + 9 \times 10^1 + 3 \times 10^0$

Binary is the same but using base 2 instead of 10.

eg. $101100_2 = 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0$
$= 32 + 8 + 4$
$= 44_{10}$.

- Any positive integer can be written in binary
- Any character is represented as a specific number code.
  - String is a sequence of characters → sequence of #s.
- Colors?
  Color → 3 numbers for red, green, blue.
  typically 8 bits per color.
  Each "pixel" (picture element) is R+G+B.

Picture = big grid of pixels.
Video = sequence of pictures.

1 byte = 8 bits. (bit = 1 or 0, "binary digit")
1 kilobyte (KB) = 1024 bytes. = 2^{10} (text message)
(kibibyte (KiB))
1 megabyte (MB) = 2^{20} bytes (small picture)
1 gigabyte (GB) = 2^{30} bytes (video, game)
1 terabyte (TB) = 2^{40} bytes (hard drive)
1 petabyte (PB) = 2^{50} bytes
exabyte (EB) = 2^{60} (Google)
⋮ (internet)