Other Useful Representations

- Octal number
  - only need 8 numbers: 0~7
  - use 3 bits to represent one digit

- Hexadecimal number
  - need 16 numbers: 0~9 and A-F
  - use 4 bits to represent one digit

- Example: 2023 in binary, octal, and hexadecimal (use unsigned number)
  - binary: $(11111100111)_2$
  - octal: $111110111_8$ (3 7 4 7)
  - hexadecimal: $011111100111_{16}$ (7 E 7)

- ASCII: a type of character code, to map character onto integers
  - Each computer has a set of characters that it uses, such as 26 uppercase letters and 26 lowercase letters. In order to transfer these characters into computer, each one is assigned a number.
  - These numbers can be converted into binaries so that characters can be stored in a computer too.
  - Originally, each ASCII character has 7 bits, allowing for 128 characters in all. Then, to support more characters, the table is extended to 255 characters, using 1 byte to represent.
  - Online ASCII table: [http://www.asciitable.com](http://www.asciitable.com)

- Images: pixels (RGB values)
- Videos: flows of images and voice data