Bit: "binary digit"

□ ← can contain a 0 or a 1

Byte: 8 bits

Fred Brooks
"The Mythical Man-Month"
Character encodings
(how do you store a character as a sequence of bytes)

ASCII
American Standard Code for Inform Interchange
1 byte = 8 bits
How many different bit patterns can you have in 1 byte?

\[
\begin{align*}
&\underbrace{00000000} \\
&\overbrace{01011010} \\
&\vdots \\
&\underbrace{2^8 = 256}
\end{align*}
\]

\[
\text{ASCII}
\]

\[
128 = 2^7 \quad (7 \text{ bit characters})
\]
Coming
Unicode
UTF-8
Binary

128 64 32 16 8 4 2 1

01001011

\[ \begin{align*}
2^3 & \cdot 2 + 2^2 & \cdot 1 & \cdot 2 + 1 \\
8 & + 0 & + 8 & + 0 & + 2 & + 1 \\
\end{align*} \]

= 75 ten
95_{ten} = ? \cdot \text{two}

Biggest power of 2 \leq 95

64 \quad 64 \quad 64
+ 31 \quad + 16 \quad + 16
+ 15 \quad + 8 \quad + 8
+ 4 \quad + 4 \quad + 4
+ 2 \quad + 2
+ 1

1011111_{two}
01011111_{two} = 9_{ten}

5 F

16 place
ones place

0 1 2 3 4 ... 9 ABCDEF

↑

15
`char str[8] = "dog";`

What is the type of `str`?
- `char *` (pointer to a `char`)
- `char const *`

`str` does not change.
\text{const char *} t = \text{"cat"}.

the string itself cannot be changed