Bits and Bytes

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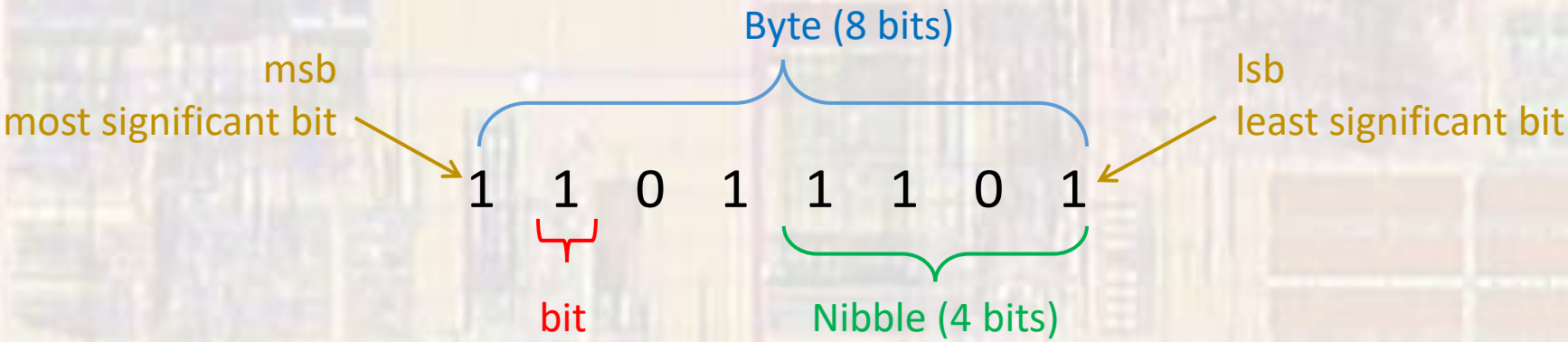
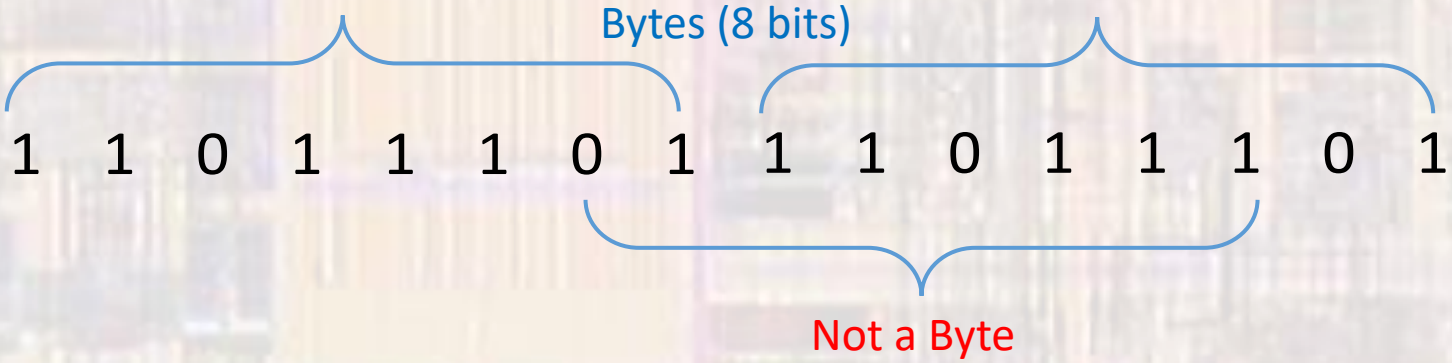
Bits and Bytes

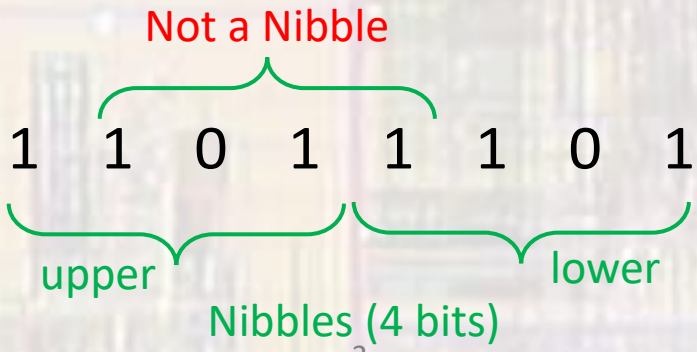
- Binary Terminology
  - Bit: single binary element
    - denoted with a small b
    - "0110 is a 4b number"
  - Nibble: a group of 4 bits
    - not normally referenced
  - Byte: a group of 8 bits
    - denoted with a capital B
    - "I need a 64B memory chip"
- MSB: Most significant bit
  - Furthest bit to the left
  - Highest valued bit when interpreted as a binary number – see Binary slides
- LSB: Least significant bit
  - Furthest bit to the right
  - Lowest valued bit when interpreted as a binary number – see Binary slides



Bits and Bytes

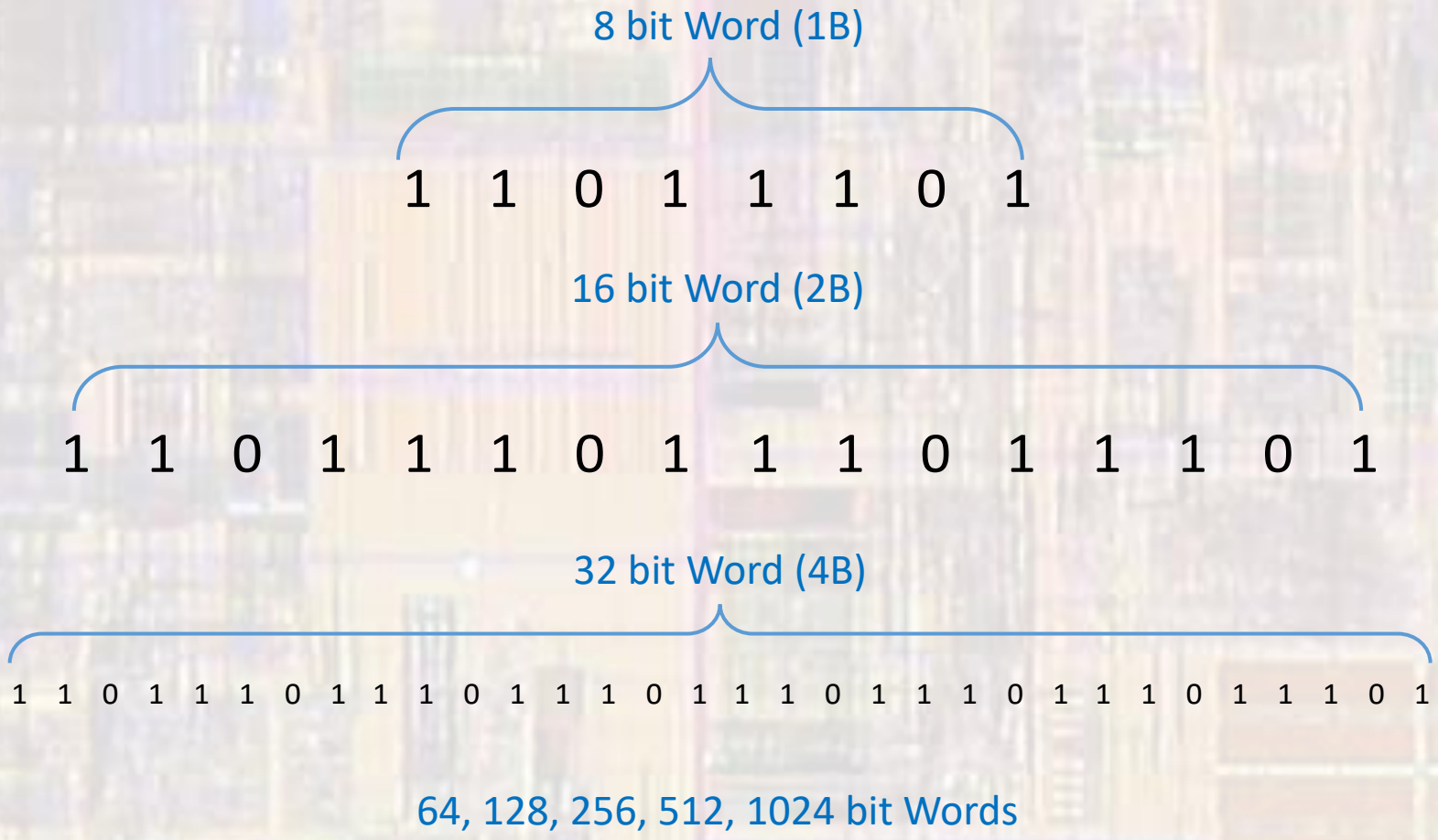
- Binary Terminology
  - Bits can be anywhere in the binary number
  - Bytes are segmented from the binary point
    - Not just any set of 8 bits
  - Nibbles are segmented within a byte
    - Upper and lower nibble





Bits and Bytes

- Binary Terminology
  - A Word is a logical collection of bytes



Bits and Bytes

- Binary Terminology
  - Assume S is an 8 bit binary number

S = 10010110

- S — 10010110
- S[7:0] = 10010110 — 10010110
- S[3:0] = 0110 — 10010110
- S[7:6] = 10 — 10010110
- S[5] = 0 — 10010110
- S[6,3] = 00 — 10010110
- S[1] = 1 — 10010110
- S[0] = 0 — 10010110