

Midterm Review

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Hierarchy is a top down approach

Modularity interfaces

Regularity compartmentalization

Digital Abstraction A to D conversion

Boolean Logic Min term is sum of products, Max term is product of sums.

Number formats Binary $101011_2 \rightarrow 2B_{16} \rightarrow 53_8$

$$\log_2(8) = 3 \text{ use every 3 bits, } \log_2(16) = 4 \text{ use every 4 bits} \quad (1)$$

Kilobyte to kilobit $\frac{kB}{4} = kb \quad 2^{32} = 2^{30} + 2^2 = 4Gb$

Micro arrangement of ...

Assembly Language Human readable format.

Machine Code binary

Principles of Computer Architecture smaller is faster, instruction set limited, limited operands, instruction format limited. Simplicity favors regularity, common format (R,J,I), simple ISA (Load store, registers). Good design demands good compromises, decoding in hardware. Make the common case fast, decoding in hardware (instruction format is similar), smaller instruction set.

Data Storage 1 word = 32 bits, byte addressable (each word needs 4 locations).

little Endian lowest byte = lowest address

big endian highest byte = lowest address
helps with data transfer, MIPS string operations.

branch instructions

instruction types I,J,R

Difference between RISC and SiSC R = MIPS, S = x86

memory Hierarchy

Convert assembly to machine assembly > block > binary (page 309 in textbook)

Convert `addi s7, s1, -15`