## Ch 1.1 Our Book's Title

NOTE03 - Introduces the foundational concept in our text - structured computer org

Text reference: **Section 1.1, 1.5** 

Instruction set, machine code - engineering decisions! Structure computer organization -

important advantages Level 5 Problem-oriented language level Translation (compiler) Level 4 Assembly language level Six level computer (bottom up) Translation (assembler) Operating system machine level Level 3 5 = Bingo! Java, C++, etc. Partial interpretation (operating system) 4 = symbolic/human access Level 2 Instruction set architecture level 3 = sys calls & resources Interpretation (microprogram) or direct execution 2 = machine + microcode Microarchitecture level Level 1 1 = datapath, microcode Hardware Level 0 Digital logic level 0 = gates, registers

"Hardware and Software are logically equivalent." "Hardware is just petrified software." When can an algorithm be moved to hardware?

Software -> Microcode -> Machine code. Example: Add = machine code; Multiply = microcode. Microcode history.

## Ch 1.5 - Metric units

- kilo, mega, giga, tera, peta, ...
- 10<sup>3</sup>, 10<sup>6</sup>, 10<sup>9</sup>, 10<sup>1</sup>2, 10<sup>1</sup>5, ...
- 2<sup>1</sup>0, 2<sup>2</sup>0, 2<sup>3</sup>0, 2<sup>4</sup>0, 2<sup>5</sup>0, ...