

Summary of Important Items to Understand Chapter 3

1. Measures of machine performance
 - Execution time
 - Clock speed
 - Clocks per instruction (CPI)
 - MIPS (Millions of Instructions Per Second)
 - FLOPS (FLoating point Operations Per Second)
 - MFLOPS (Millions of FLOPS)
 - Whetstone benchmarks
 - Dhrystone benchmarks
 - SPEC (System Performance Evaluation Cooperative) benchmarks
2. Characteristics of Reduced Instruction Set Computer (RISC)
 - One instruction per cycle
 - Fixed instruction length
 - Only load and store instructions access memory
 - Simplified addressing modes
 - Fewer and simpler instructions
 - Delayed loads and branches
 - Prefetch and speculative execution
 - Let the compiler do it
3. Characteristics of Complex Instruction Set Computer (CISC)
 - Many complex instructions and addressing modes
 - Some instructions take many steps to execute
 - Not always easy to find the best instruction for a task
4. Motorola 68000 processor
 - Understand as an example of a CISC architecture
 - Instruction set
 - Instruction formats
 - Register set
 - Addressing modes
 - Memory organization
 - Condition code bits
 - Assembly language programming
 - Input/Output (I/O)
 - Memory-mapped I/O
 - Isolated I/O
5. Sun Microsystems SPARC (Scalable Processor ARChitecture)
 - Understand as an example of a RISC architecture
 - Instruction set
 - Instruction format
 - Register set
 - Concept of pipelining