

ADVANCED PROCESSOR
ARCHITECTURES AND MEMORY
ORGANISATIONs –
Lesson-7: Performance Metrics

Processor Metrics

- 1) MIPS – Million Instructions Per Second
- 2) MFLOPS – Million Floating Point Operations Per Second
- 3) Dhrystone/s – Number of times a benchmark program called Dhrystone program can run per second. [1MIPS = 1757 Dhrystone/s]

Performance of Memory

- **Accesses from the registers fastest, then fast from caches, then physical memory and then IO units**
- **Fetch or write time intervals during the memory transactions**
- **Memory transactions an effect on the overall system performance**

Example

- **Assume that access time from caches is 5 ns per word**
- **Physical memory access RAM is 100 ns per word**
- **Performance depends on probability that processor finds the data in the caches. When is 0.9, then access time average is $(0.9 \times 5 + 0.1 \times 100) = 4.5 + 10 \text{ ns} = 14.5 \text{ ns}$.**

Example

- **Assume access time from registers is 1 ns and a program in a system uses 10% register accesses in computations then access time average during computations = $(0.9 \times 14.5 + 0.1 \times 1) = 12.65 + .1 \text{ ns} = 12.75 \text{ ns}$**

EDN Embedded Benchmark Consortium (EEMBC) five-benchmark program suites

- Telecommunications
- Consumer Electronics
- Automotive and Industrial Electronics
- Consumer Electronics
- Office Automation.

Summary

We learnt

- Performance Metrics
- Memory Access Performance
- EDN Benchmark

End of Lesson 7 of Chapter 4 on Performance Metrics