



NATIONAL RESEARCH  
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# Computer Architecture and Operating Systems

## Lecture 3: Computer Architecture and Language

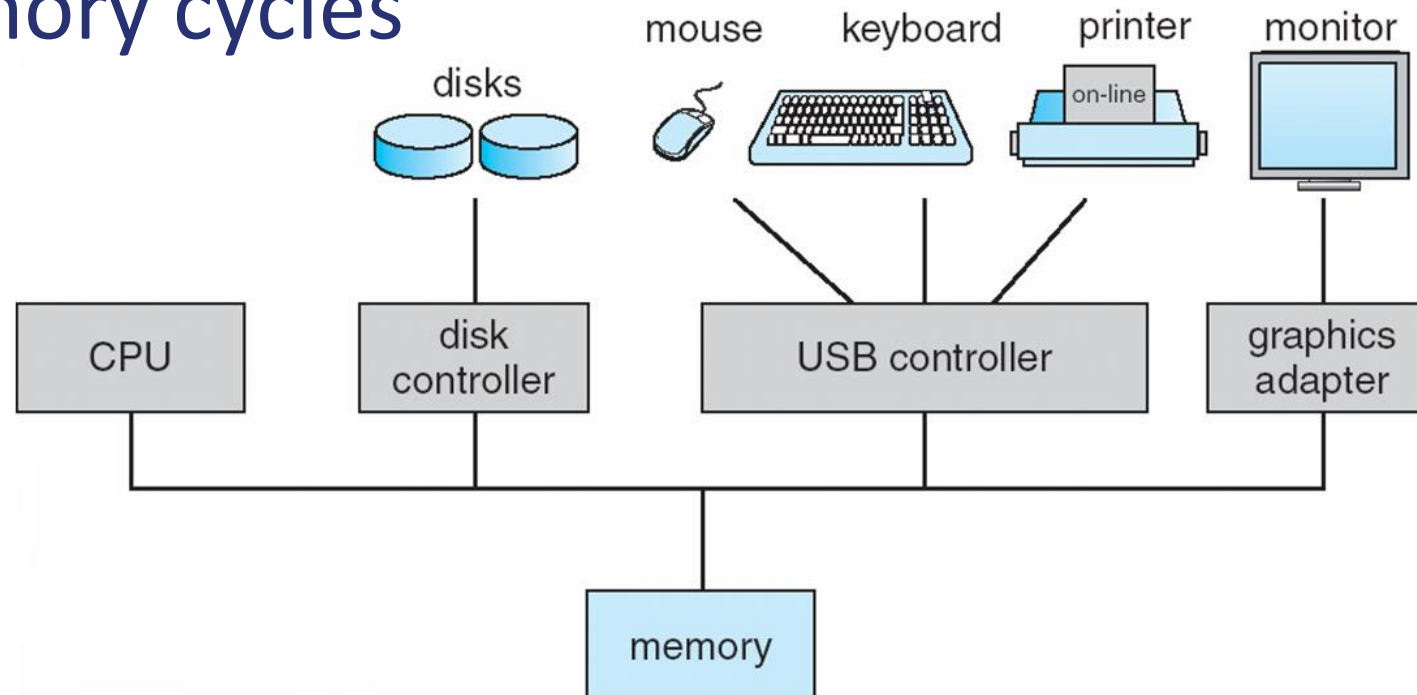
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# Modern Computer Organization

- One or more CPUs and device controllers connect through common bus providing access to shared memory
- Concurrent execution of CPUs and devices competing for memory cycles



# Eight Great Ideas

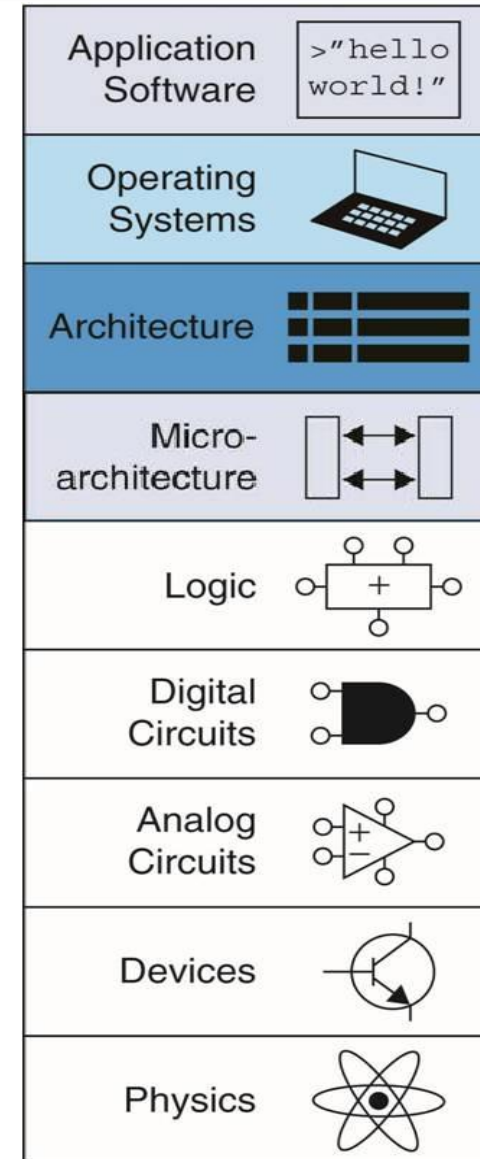
- Design for *Moore's Law*
- Use *abstraction* to simplify design
- Make the *common case fast*
- Performance *via parallelism*
- Performance *via pipelining*
- Performance *via prediction*
- *Hierarchy* of memories
- *Dependability* *via* redundancy



# Abstraction

- Hiding details when they are not important

Focus  
of this  
course



# Any Questions?

```
                .text
__start:        addi t1, zero, 0x18
                addi t2, zero, 0x21
cycle:          beq t1, t2, done
                slt t0, t1, t2
                bne t0, zero, if_less
                nop
                sub t1, t1, t2
                j cycle
                nop
if_less:        sub t2, t2, t1
                j cycle
done:           add t3, t1, zero
```