Computer system architecture
Chapt 4. Register transfer & Microoperations

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REGISTER TRANSFER AND MICROOPERATIONS

- Register Transfer Language
- Register Transfer
- Bus and Memory Transfers
- Arithmetic Microoperations
- Logic Microoperations
- Shift Microoperations
- Arithmetic Logic Shift Unit

SIMPLE DIGITAL SYSTEMS

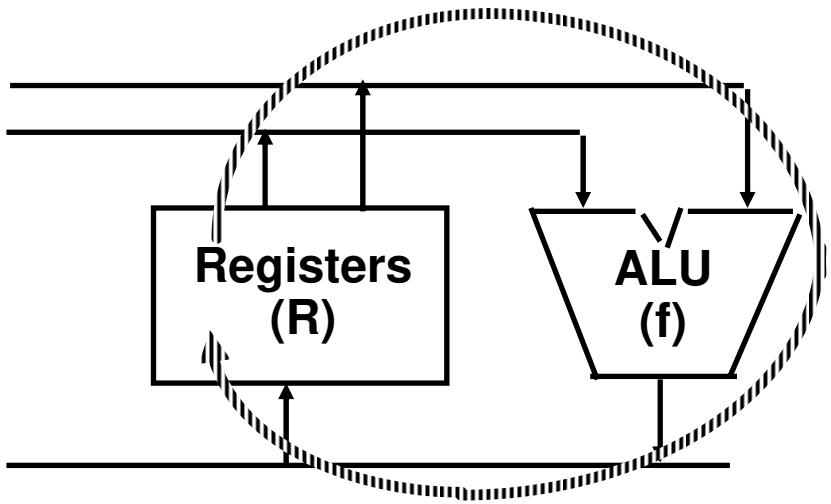
- Combinational and sequential circuits (learned in Chapters 1 and 2) can be used to create simple digital systems.
- These are the low-level building blocks of a digital computer.
- Simple digital systems are frequently characterized in terms of
  - the registers they contain, and
  - the operations that they perform.
  - the control that initiates the sequence of microoperations
- Typically,
  - What operations are performed on the data in the registers
  - What information is passed between registers

MICROOPERATIONS (1)

- The operations on the data in registers are called microoperations.
- The functions built into registers are examples of microoperations
  - Shift
  - Load
  - Clear
  - Increment
  - …

MICROOPERATION (2)

An elementary operation performed (during one clock pulse), on the information stored in one or more registers



1 clock cycle

$R \leftarrow f(R, R)$

f: shift, load, clear, increment, add, subtract, complement, and, or, xor, …