RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF ENGINEERING & TECHNOLOGY

CSPS-106 Computer Organization

Lecture-06

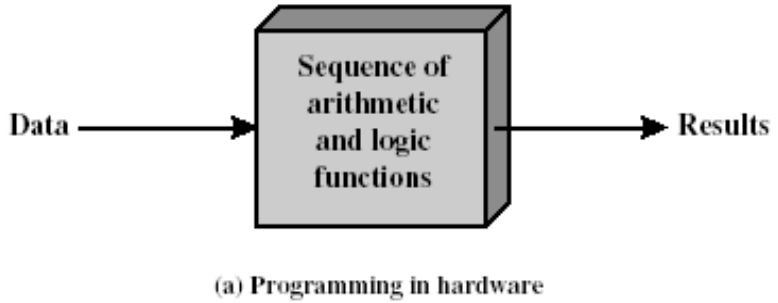
Mr. Dilip Kumar J Saini
Assistant Professor
Computer Science & Engineering

OUTLINE

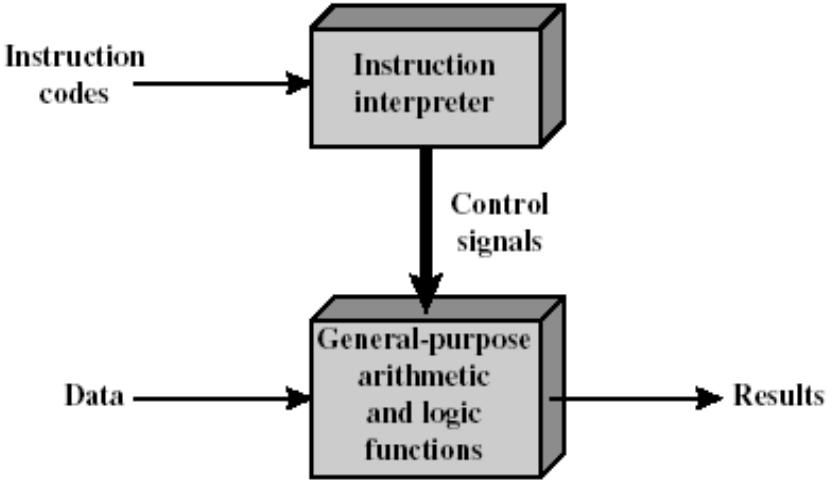
- ENIAC – BACKGROUND
- STRUCTURE OF VON NEUMANN MACHINE
- STRUCTURE OF IAS
- GENERATIONS OF COMPUTER
- PENTIUM EVOLUTION

PROGRAM CONCEPT

- Hardwired systems are inflexible
- General purpose hardware can do different tasks, given correct control signals
- Instead of re-wiring, supply a new set of control signals



(a) Programming in hardware



(b) Programming in software

WHAT IS A PROGRAM?

- A sequence of steps
- For each step, an arithmetic or logical operation is done
- For each operation, a different set of control signals is needed

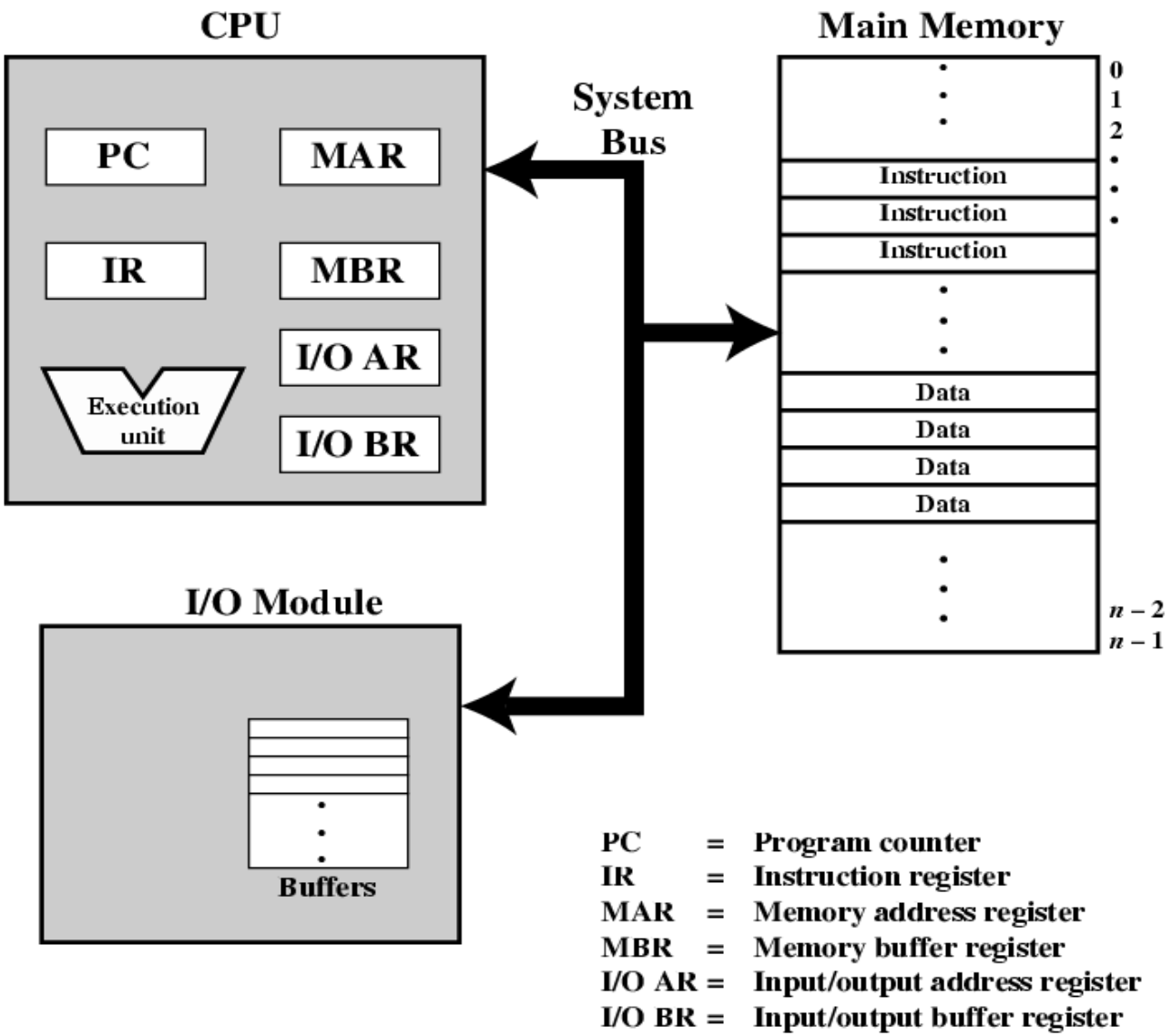
FUNCTION OF CONTROL UNIT

- For each operation a unique code (opcode) is provided
  - e.g. ADD, MOVE
- A hardware segment accepts the code and issues the control signals
- We have a computer!

COMPONENTS

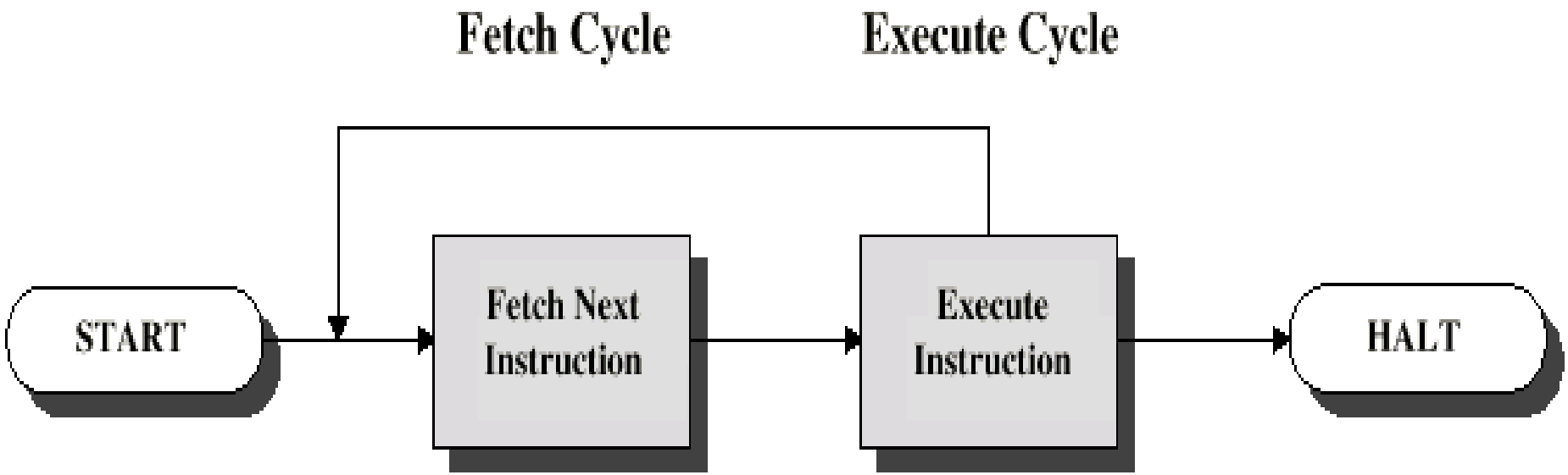
- The Control Unit (CU) and the Arithmetic and Logic Unit (ALU) constitute the Central Processing Unit (CPU)
- Data and instructions need to get into the system and results need to get out
  - Input/output (I/O module)
- Temporary storage of code and results is needed
  - Main memory (RAM)

COMPUTER COMPONENTS:



INSTRUCTION CYCLE

- Two steps:
  - Fetch
  - Execute



FETCH CYCLE

- Program Counter (PC) holds address of next instruction to fetch
- Processor fetches instruction from memory location pointed to by PC
- Increment PC
  - Unless told otherwise
- Instruction loaded into Instruction Register (IR)

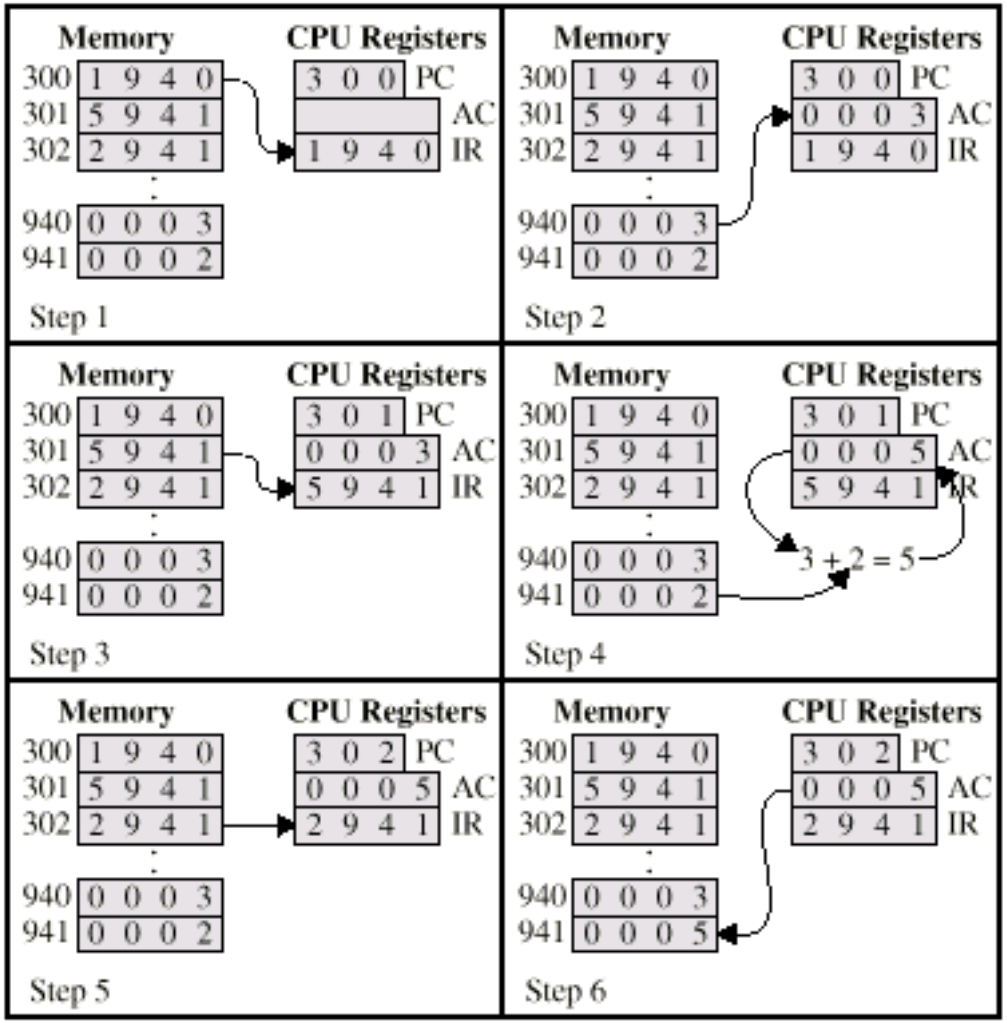
EXECUTE CYCLE

- Processor interprets instruction and performs required actions, such as:
  - Processor - memory
    - data transfer between CPU and main memory
  - Processor - I/O
    - Data transfer between CPU and I/O module
  - Data processing
    - Some arithmetic or logical operation on data
  - Control
    - Alteration of sequence of operations
    - e.g. jump
  - Combination of above

EXAMPLE OF PROGRAM EXECUTION

Note use of hexadecimal

Fetch Execution



Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	The addressing mode which makes use of in-direction pointers is _____	Indirect addressing mode	Index addressing mode	Relative addressing mode	Offset addressing mode
2	The addressing mode/s, which uses the PC instead of a general purpose register is _____	Indexed with offset	Relative	Direct	Both Indexed with offset and direct
3	The addressing mode, where you directly specify the operand value is _____	Immediate	Direct	Definite	Relative
4	_____ addressing mode is most suitable to change the normal sequence of execution of instructions.	Relative	Indirect	Index with Offset	Immediate
5	Which method/s of representation of numbers occupies a large amount of memory than others?	Signs magnitude	1's complement	2's compliment	1's & 2's compliment

REFERENCES

- http://www.engppt.com/search/label/Computer%20Organization%20and%20Architecture
- http://www.engppt.com/search/label/Computer%20Architecture%20ppt