University of Salahaddin – College of Engineering
Software & Informatics Dep.

Computer Architecture II
2023-2024

Lecture 1

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intel
pentium 4
2.4 GHZ/512/400/1.5V
SL65R COSTA RICA
3212A185-0282
INTEL©'01

Micro processor Architecture

A computer system has three main component (internal H/W feature)

- ❖CPU (processor)
- ❖Memory (ROM, RAM,..)
- ❖Internal bus

External H/W feature are

- ❖I/O device such as (Keyboard, printer, hand scanner,…..)

Software :

- ❖Operating system
- ❖Program and data file stored on disk

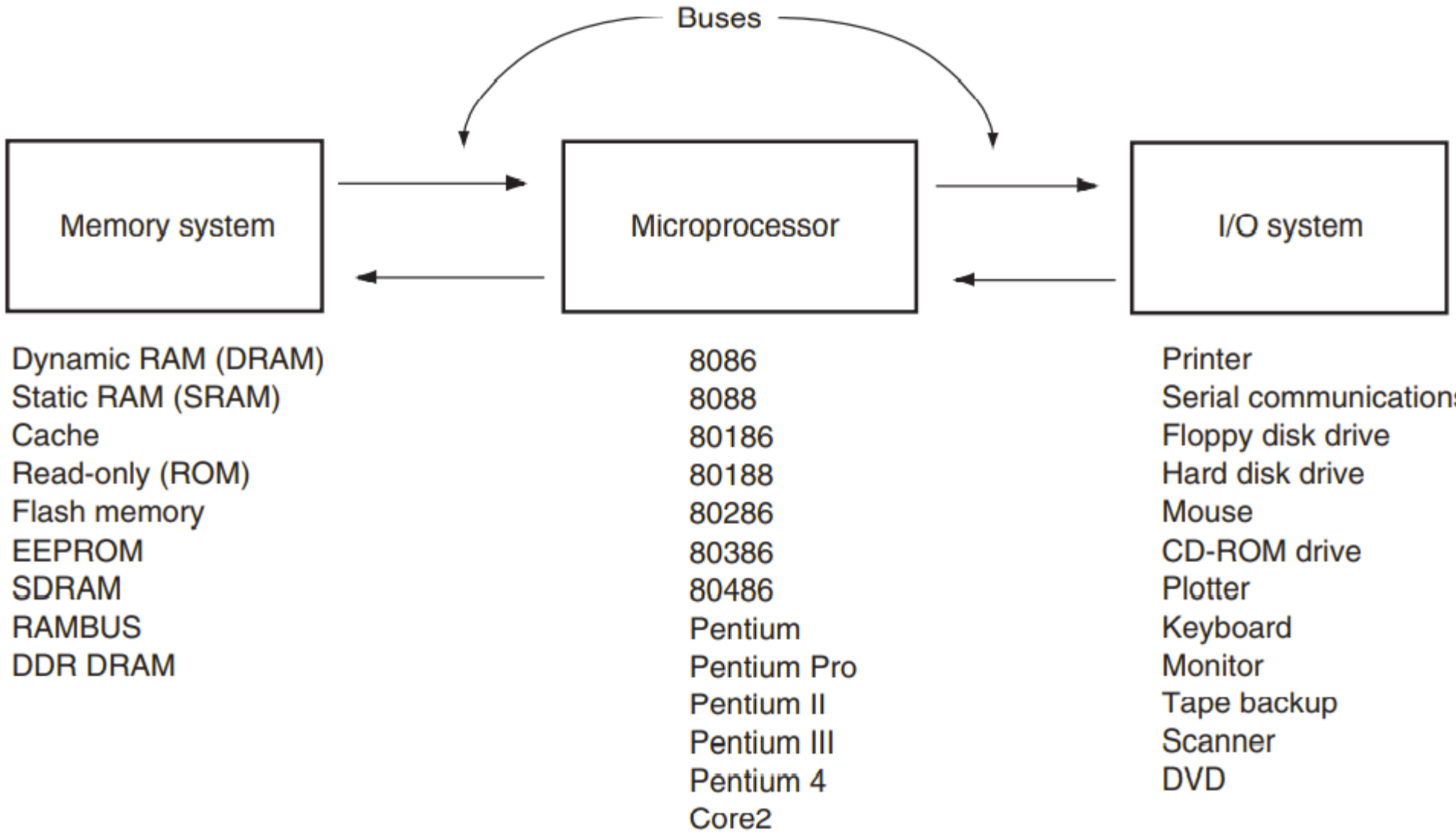
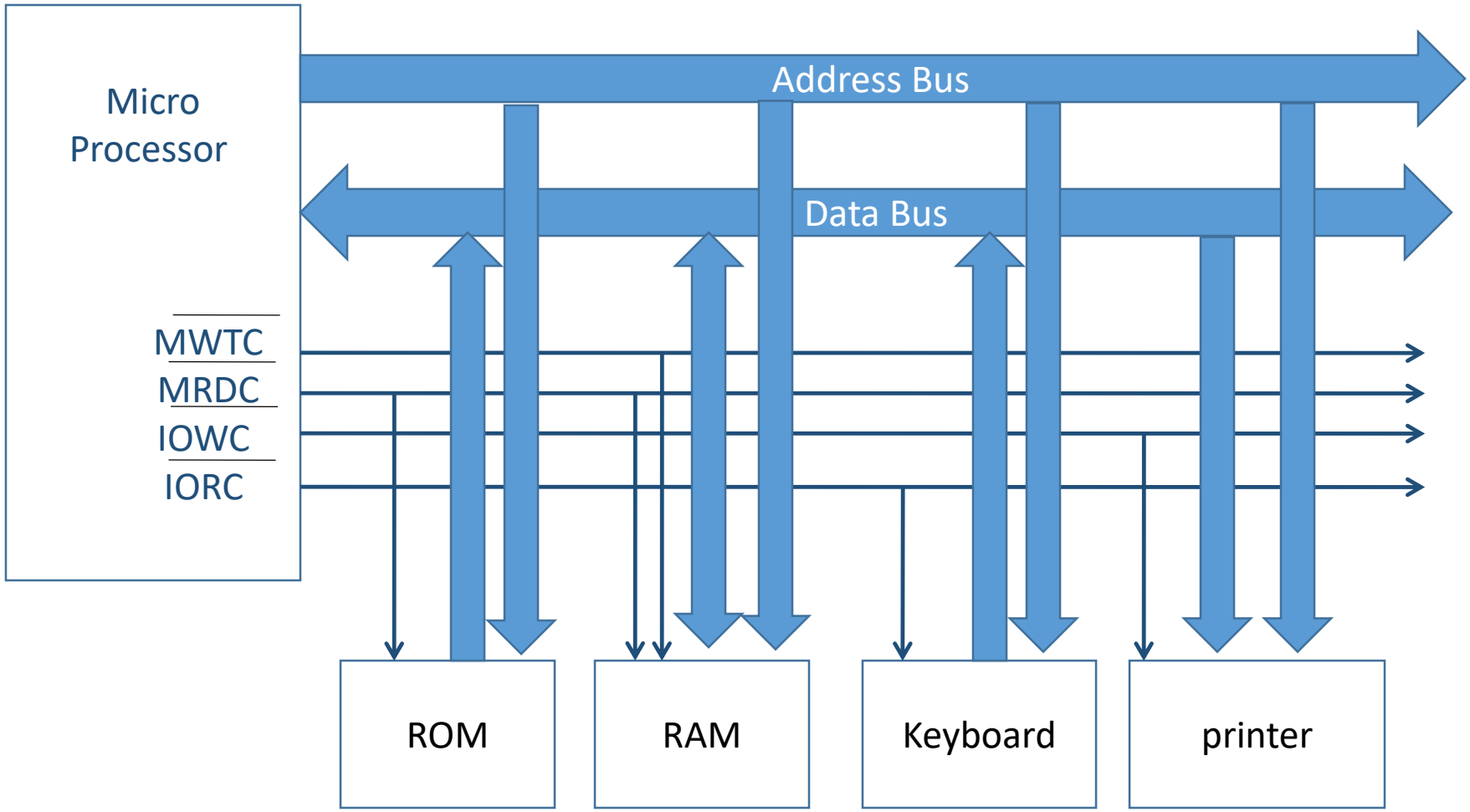


FIGURE 1 The block diagram of a microprocessor-based computer system.



Block diagram of a computer system showing the address, data, and control bus structure

System bus

- Definition : common group of wires connect the component of the system {processor, memory, and peripherals} .

❖Address bus

❖Data bus

❖Control bus

Internal Architecture of 8086

8086 has two Main Units BIU and EU:

The BIU performs all bus operations such as instruction fetching, reading and writing operands from and to memory and calculating the operands address.

* The instruction bytes are transferred to the instruction queue.

  EU executes instructions from the instruction system byte queue.

* Both units operate **Asynchronously** to give the processor an overlapping instruction fetch and execution mechanism which is called as **Pipelining**. This results in efficient use of the system bus and system performance.

Internal Architecture of 8086

* BIU is responsible for performing all external bus operations.

* BIU contains Instruction queue, Segment registres, Instruction pointer, Address adder.

* Processor provides a full 16 bit bidirectional data bus and 20 bit address bus (memory of 1 Mbyte size).

8086 Microprocessor (cont..)

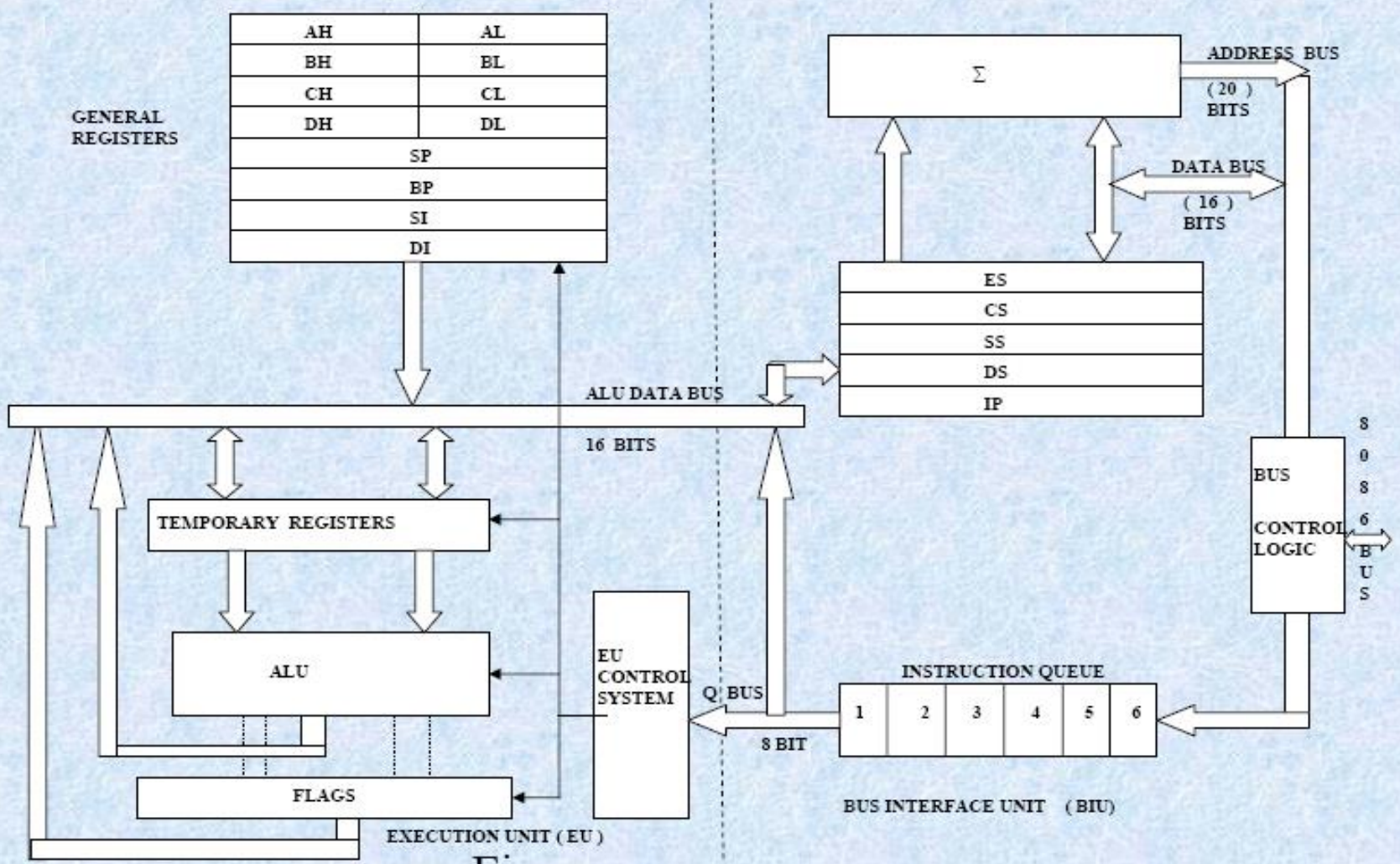
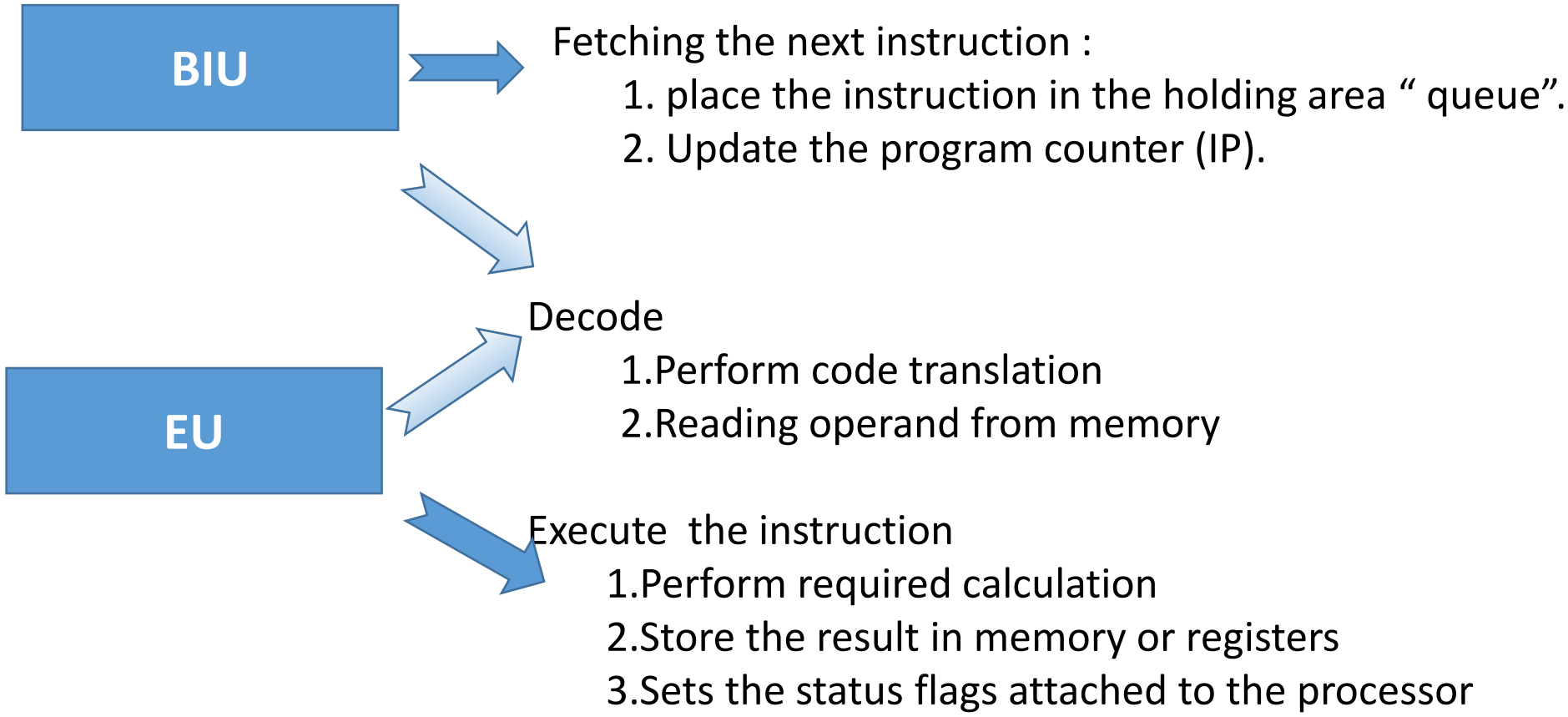


Fig:


BIU
Fetching the next instruction :
1. place the instruction in the holding area “ queue”.
2. Update the program counter (IP).
EU
Decode
1.Perform code translation
2.Reading operand from memory
Execute the instruction
1.Perform required calculation
2.Store the result in memory or registers
3.Sets the status flags attached to the processor