

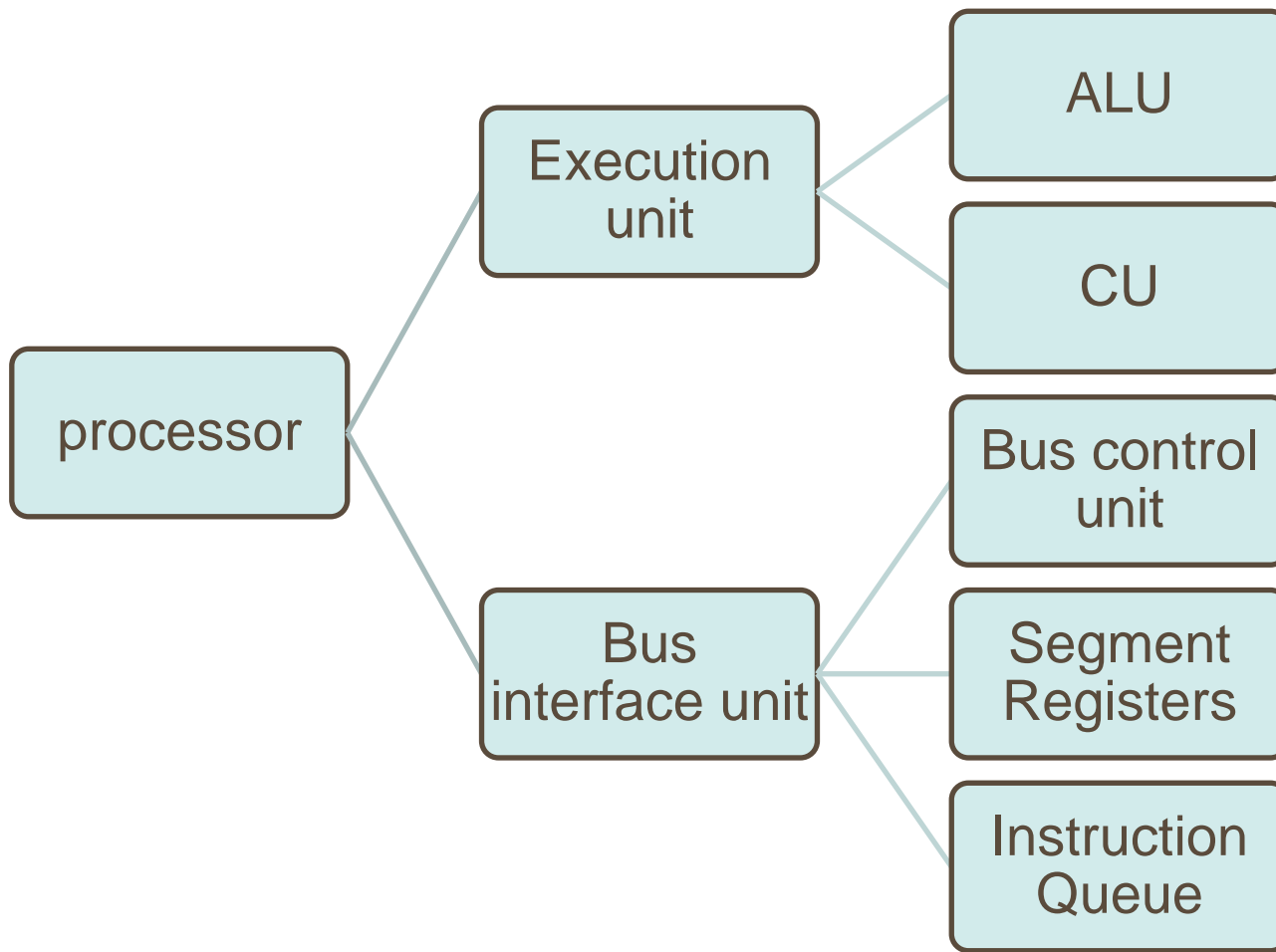
Basic features of PC hardware

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Basic features of PC Hardware

- Binary and Hexadecimal Number Systems
 - Bits/bytes
 - Binary number systems
 - Hexadecimal
 - ASCII
- PC Components
 - Processor
 - Memory



- BIU delivers data and instruction to EU, Memory and I/O devices
- BTU access instruction in memory and place them in instruction queue

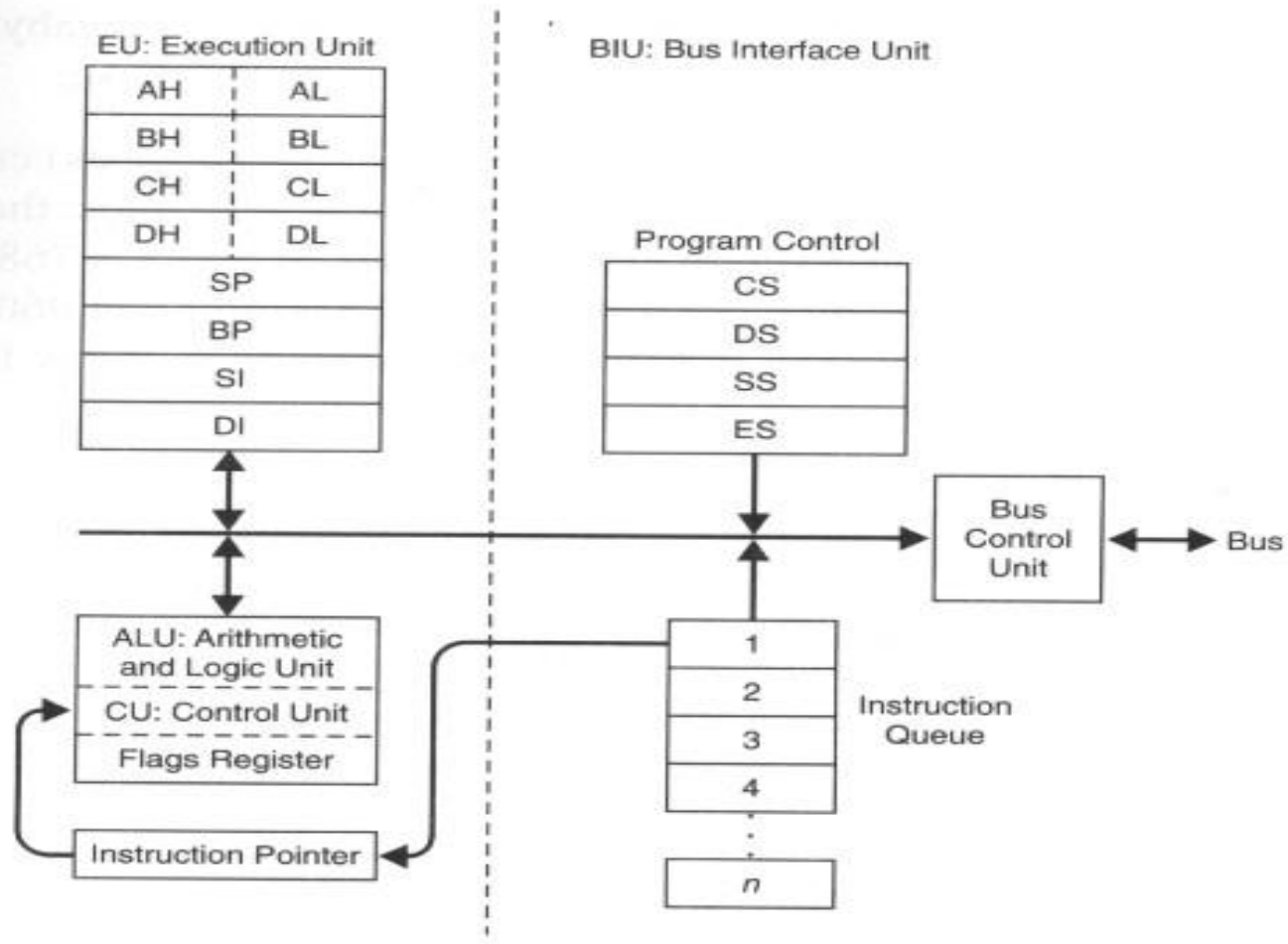
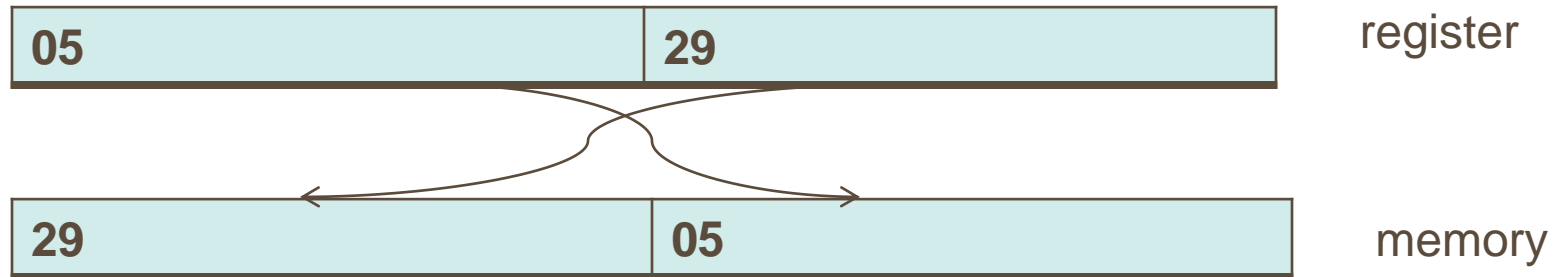


Figure 1-2 Execution Unit and Bus Interface Unit

Addressing data in Memory

- Difference between address of a memory Location and its content
- Processor stores the data in memory in reverse by sequence
- Ex: $(1.315)_{10} = (0529)_{16}$ (placed in memory in 2 bytes)

High order (most significant) Low order (least significant)
05 29



Least significant byte

Most significant byte

Segments

- A special area defined in memory begins on a paragraph boundary
- Up to 64k byte
- Main segments :
 - Code segment (CS): contains machine instructions to be executed
 - Data segment (DS): contains program data and constants
 - Stack segment (SS): contains data or addresses needed by called subroutine
- CS , DS and SS registers contain addresses of segments
- Actual address = segment address + offset

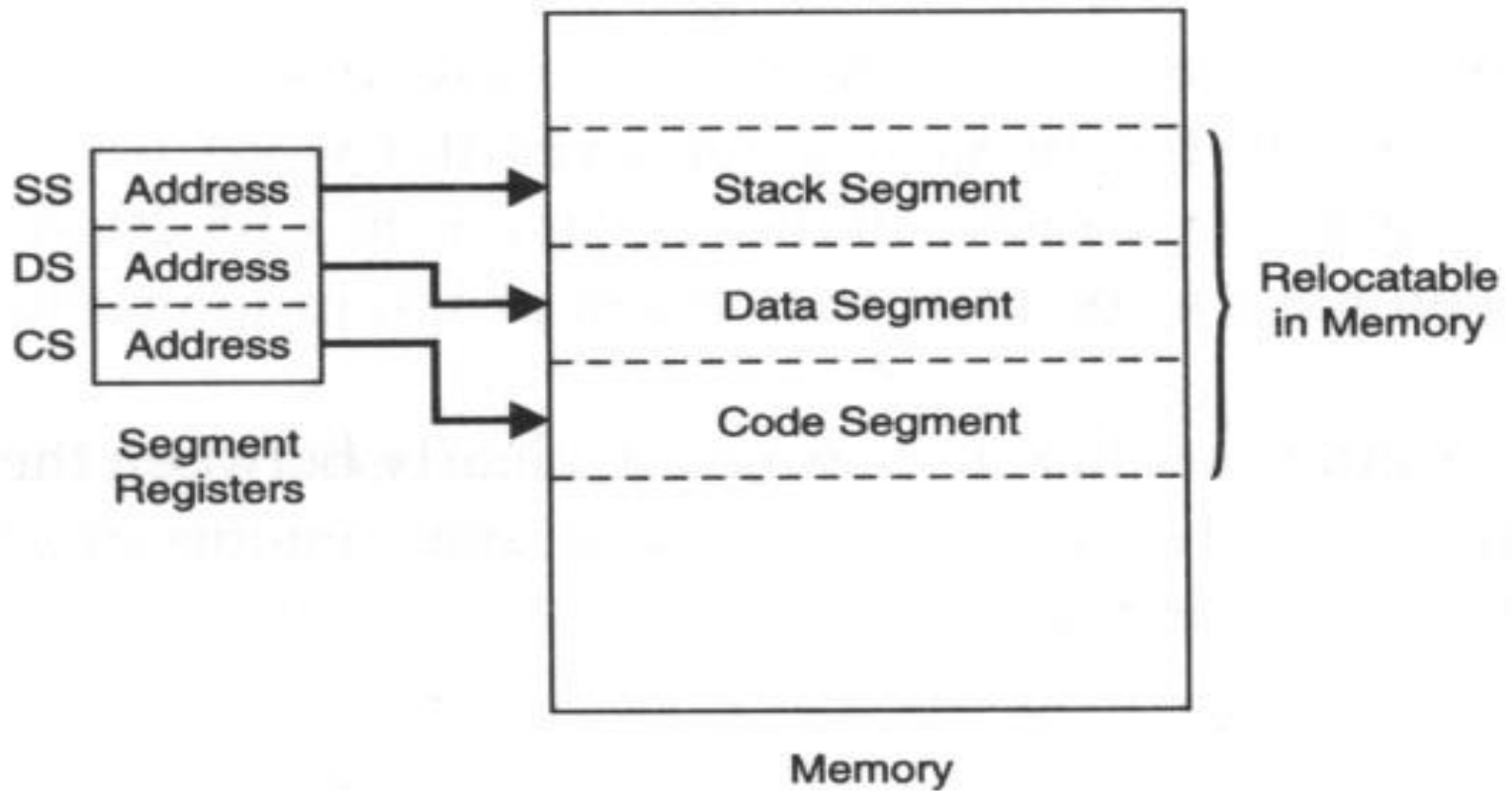


Figure 1-4 Segments and Registers

General Registers

- Segment register
 - CS,DS,SS,ES, FS and GS
- Pointer register
 - address of next instruction= address in CS+ offset address in IP
 - address of current word in stack = address in SS+ offset address in SP
 - BP: facilitates referencing parameters in stack
- General purpose register
 - AX (accumulator) : I/O and arithmetic
 - BX(base reg) : index to extended address
 - CX(counter reg) : for looping
 - DX(data reg): for I/O operations
- Index register
 - SI, DI

Flag Registers

- **OF**: overflow
- **DF**: direction for moving or comparing strings
- **IF**: interrupt
- **TF** : trap (you can step through execution a single instruction at a time to examine the effect on registers and memory)
- **SF**: sign(0=positive , 1= negative)
- **ZF**: indicates result of arithmetic or comparison (0=nonzero, 1=zero)
- **AF**: auxiliary carry contain a carry out of 3 bit on 8bit data
- **PF**: parity (odd or even)
- **CF**: carry

