

أسئلة واجوبة لمادة الاسبيلي

- The main components of the BIU are:

- 6-byte Instruction Queue (Q). or 6 Byte Pre-fetch Queue (FIFO).
- Segment Registers (CS, DS, ES, SS).
- Instruction Pointer (IP).
- Address Generation (Σ).

BIU performs the following functions:

- It generates the 20-bit physical address for memory access (Address relocation).
- It fetches instructions or operand from the memory.
- It transfers data to and from the memory and I/O.
- Maintains the 6-byte pre-fetch instruction queue (supports pipelining).

- BIU takes care of all data and addresses transfers on the buses for the EU like sending addresses , fetching instructions from the memory, reading data from the memory as well as writing data to the memory.

- the Segment Registers are located in the BIU.

- the General-purpose registers are located in the EU.

- the 8086 has four special segment register :

1-code segment CS 16-bit

2-data segment DS 16-bit

3-extra segment ES 16-bit

4-stack segment SS 16 bit

-The Segment Registers have a very special purpose – pointing at **accessible blocks of main memory**.

- To be able to support memory address spaces larger than the native size of the internal address register would allow.

- **The CS register:** points at the segment containing the currently executing machine instructions.

- **The DS register:** is that segment of memory which is used to store global variables for the program.

- DS is a 16-bit register containing address of 64KB segment

- **The ES register:** is exactly that: a spare segment that may be used for specifying a location in memory.

- **The SS register:** it stores the starting address of the stack. The Stack Segment is that segment of memory which is used to store stack data.

- **What is the advantage of memory segmentation?**

➤ Segmentation helps you to increase the speed of execution so that processor can able to fetch & execute the data from the memory even faster and easier.

➤ The Segmentation allows the memory capacity to be 1 MB, although the actual address to be handled is of 16-bit size.

- If the 8086 in 16 bits can only address 64K of RAM! How many address lines or address buses are required to address 1 MB memory?

It depends not on the amount of memory, but on the address space. So, you need $\log_2(n)$ bits to address n bytes .

Table: Default segment and offset register combinations

Segment register	Offset register	purpose
CS	IP	Address of the next instruction, also called pc
DS	SI,DI	Address of data
SS	SP,BP	Sp : top of the stack , Bp :address in stack
ES	DI	String destination address ,for string instruction

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