# Arquitetura de Computadores

# Arquitetura e Funcionamento dos Computadores

## Parte 006

## Arquitetura INTEL

### Registos e Segmentos Comuns

**Comuns** a toda a Família da Arquitetura Intel desde o Microprocessador 8086 (1979) até hoje (i5, i7, i9, etc.).

**Notas soltas sobre:**

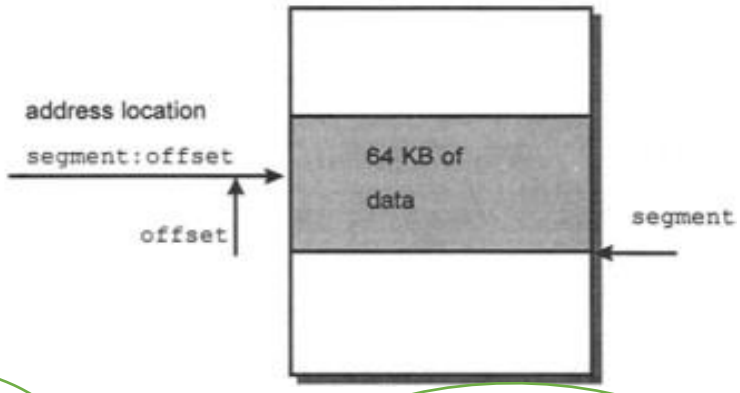
Registos **comuns**, segmentos, segmentação e o SR Flags (Status Register Flags).

**Registos e Segmentos:**

**General-Purpose Registers**

| 31 16 | 15 8 | 7 0 | 16-bit | 32-bit |
|---|---|---|---|---|
| | AH | AL | AX | EAX |
| | BH | BL | BX | EBX |
| | CH | CL | CX | ECX |
| | DH | DL | DX | EDX |
| | BP | | | EBP |
| | SI | | | ESI |
| | DI | | | EDI |
| | SP | | | ESP |

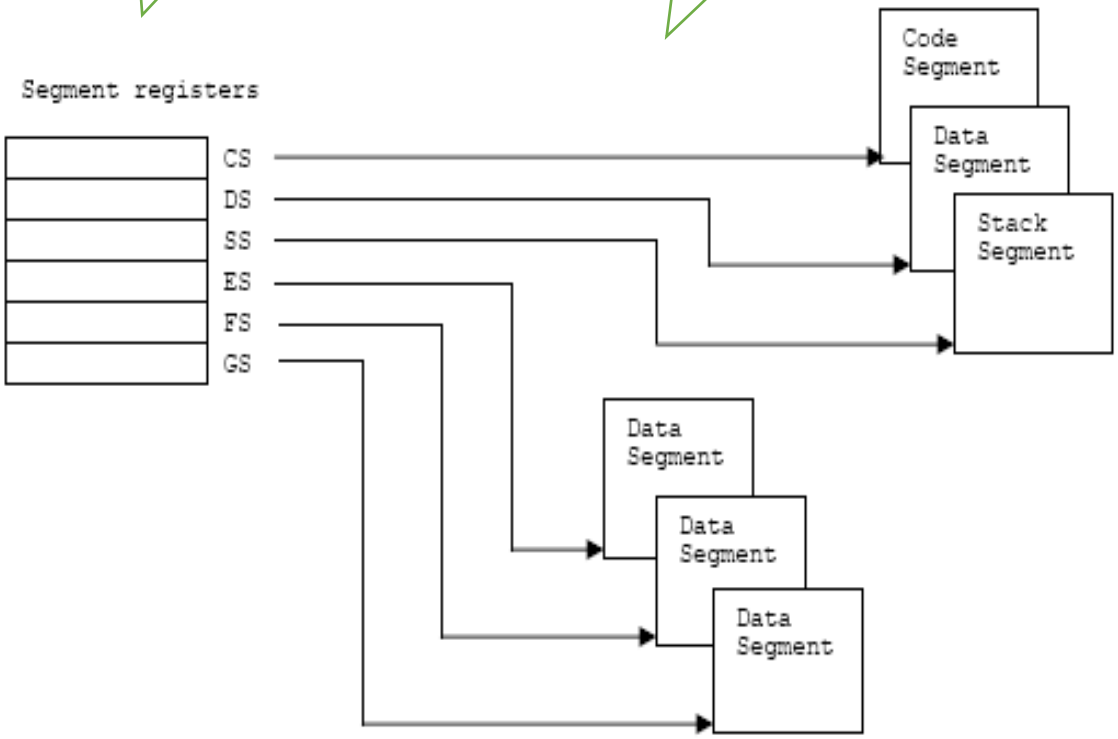
| | | | | | |
|---|---|---|---|---|---|
| Segment (2F84): | 0010 | 1111 | 1000 | 0100 | 0000 |
| Offset (0532): | | 0000 | 0101 | 0011 | 0010 |
| Actual address: | 0010 | 1111 | 1101 | 0111 | 0010 |



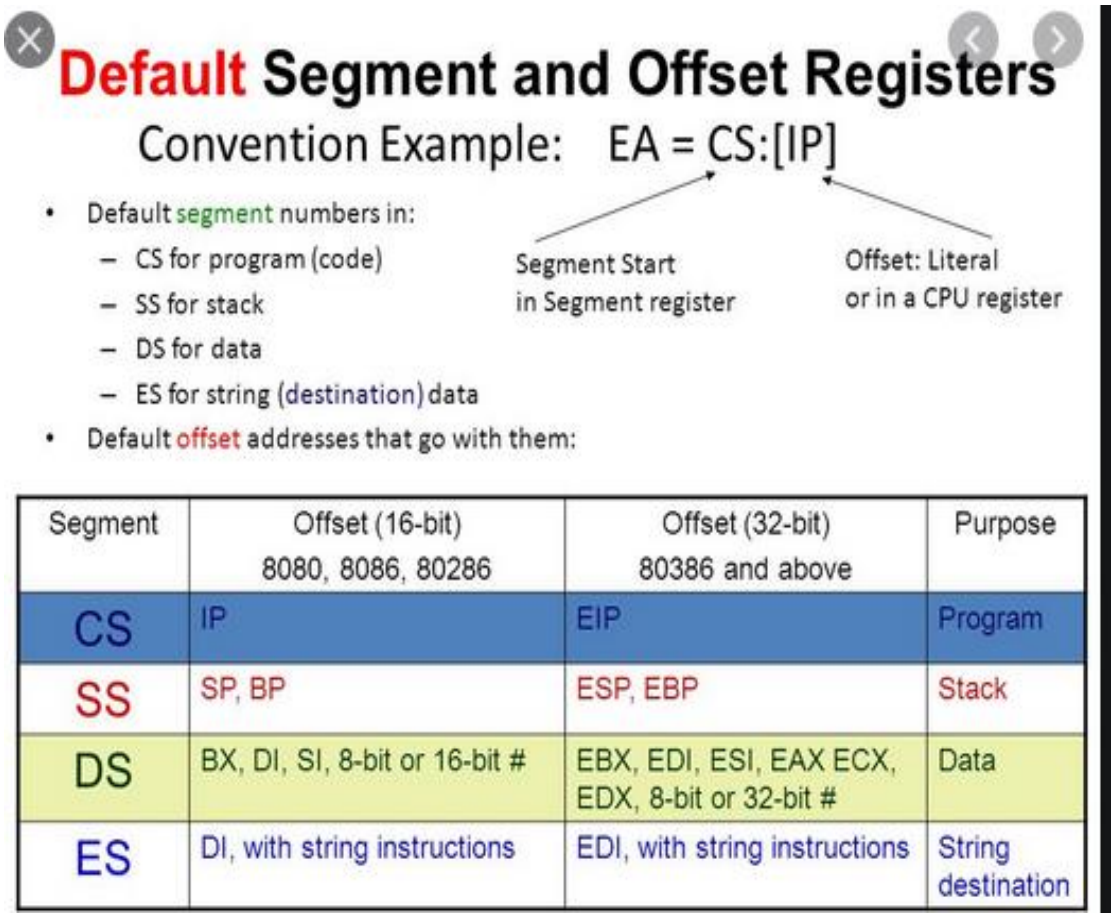

Registos das bases dos segmentos dentro do Processador

Os segmentos que se encontram na RAM

(por omissão são de 64 KB)



**Offsets (deslocamentos ou índices) por *defeito* (omissão):**



## Default Segment and Offset Registers

Convention Example: EA = CS:[IP]

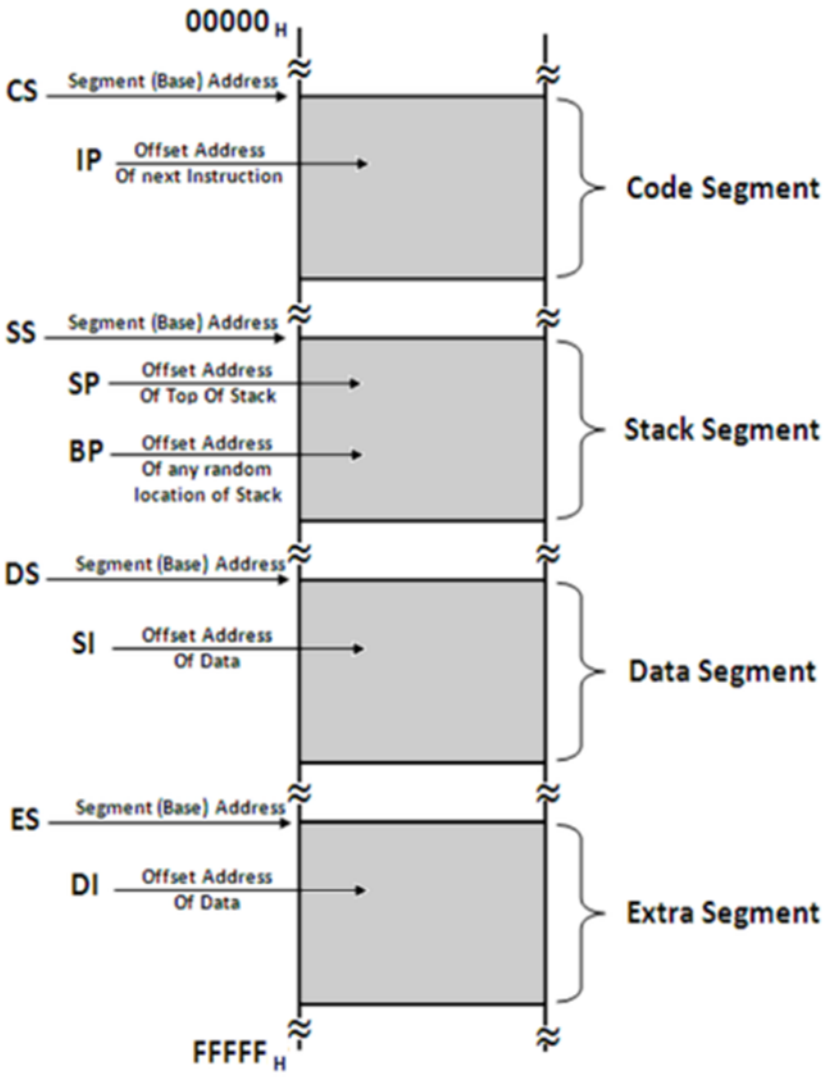
Segment Start in Segment register

Offset: Literal or in a CPU register

- Default segment numbers in:
  - CS for program (code)
  - SS for stack
  - DS for data
  - ES for string (destination) data
- Default offset addresses that go with them:

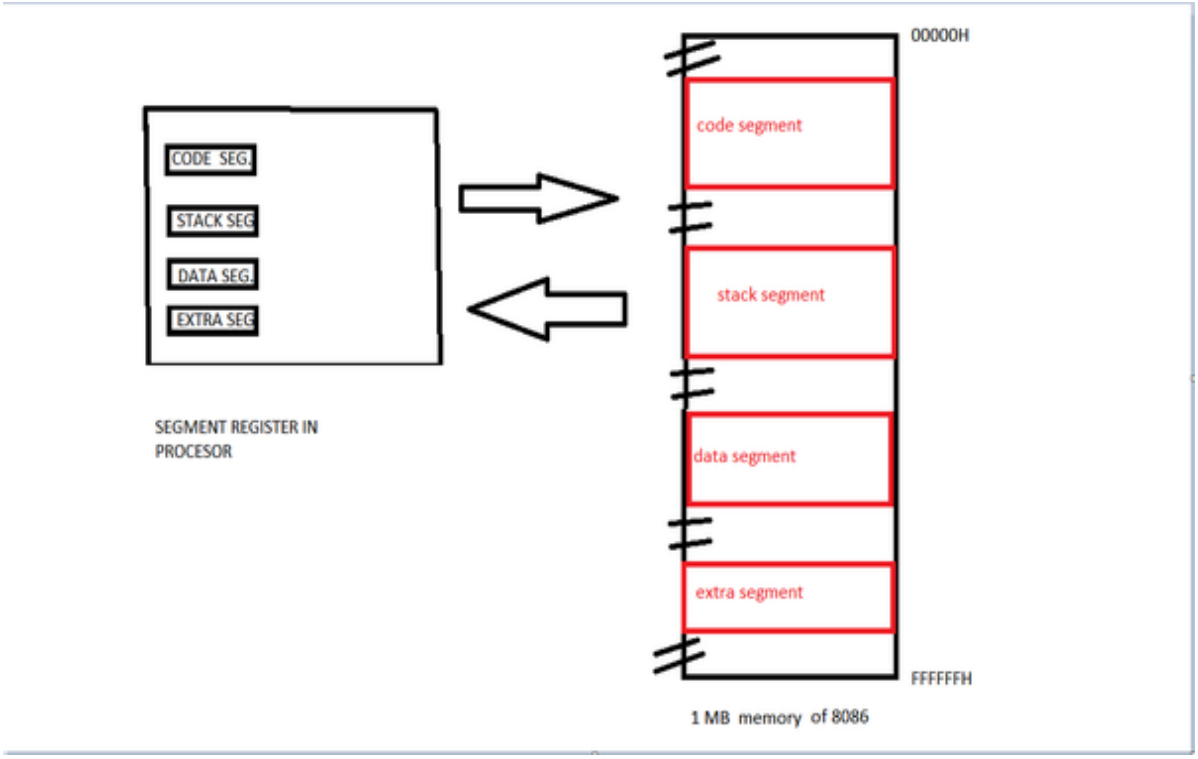
| Segment | Offset (16-bit) 8080, 8086, 80286 | Offset (32-bit) 80386 and above | Purpose |
|---|---|---|---|
| CS | IP | EIP | Program |
| SS | SP, BP | ESP, EBP | Stack |
| DS | BX, DI, SI, 8-bit or 16-bit # | EBX, EDI, ESI, EAX ECX, EDX, 8-bit or 32-bit # | Data |
| ES | DI, with string instructions | EDI, with string instructions | String destination |

## MEMORY SEGMENTATION IN 8086

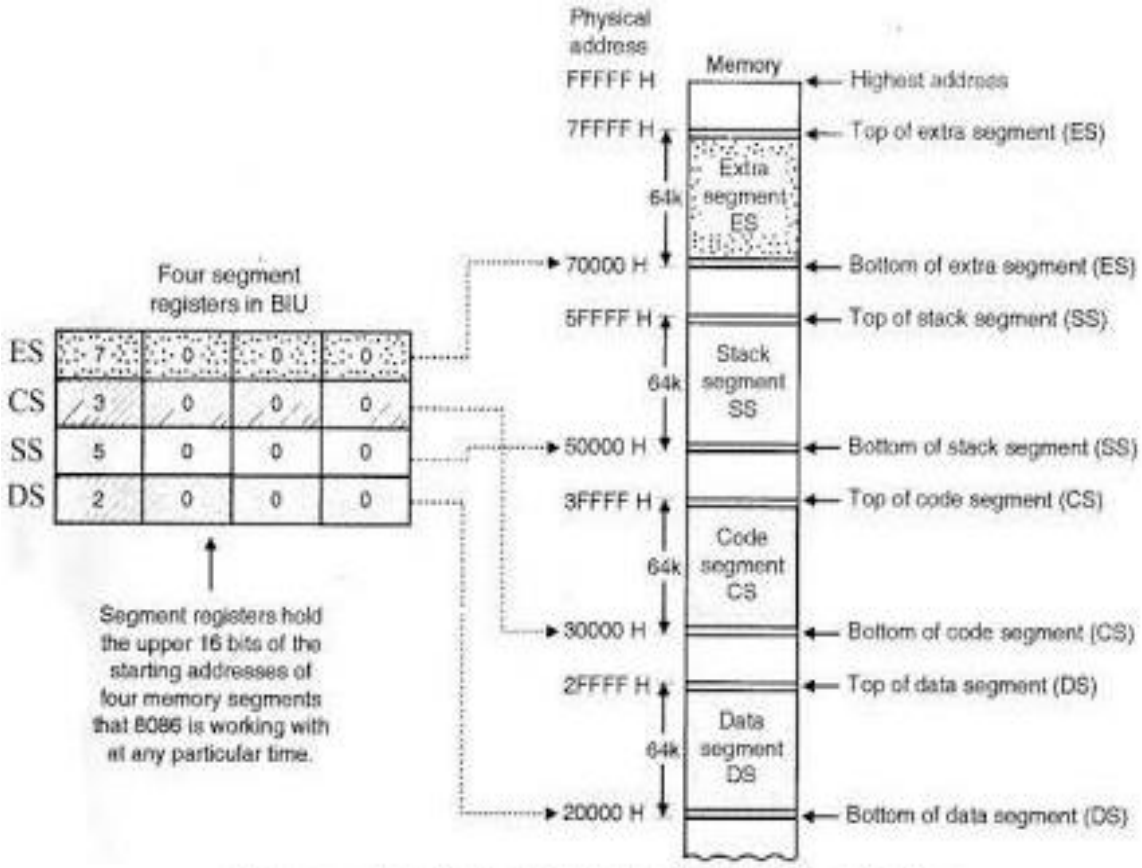


## Outras Perspetivas (das nossas notas soltas):

### 1. Outra Perspetiva 1

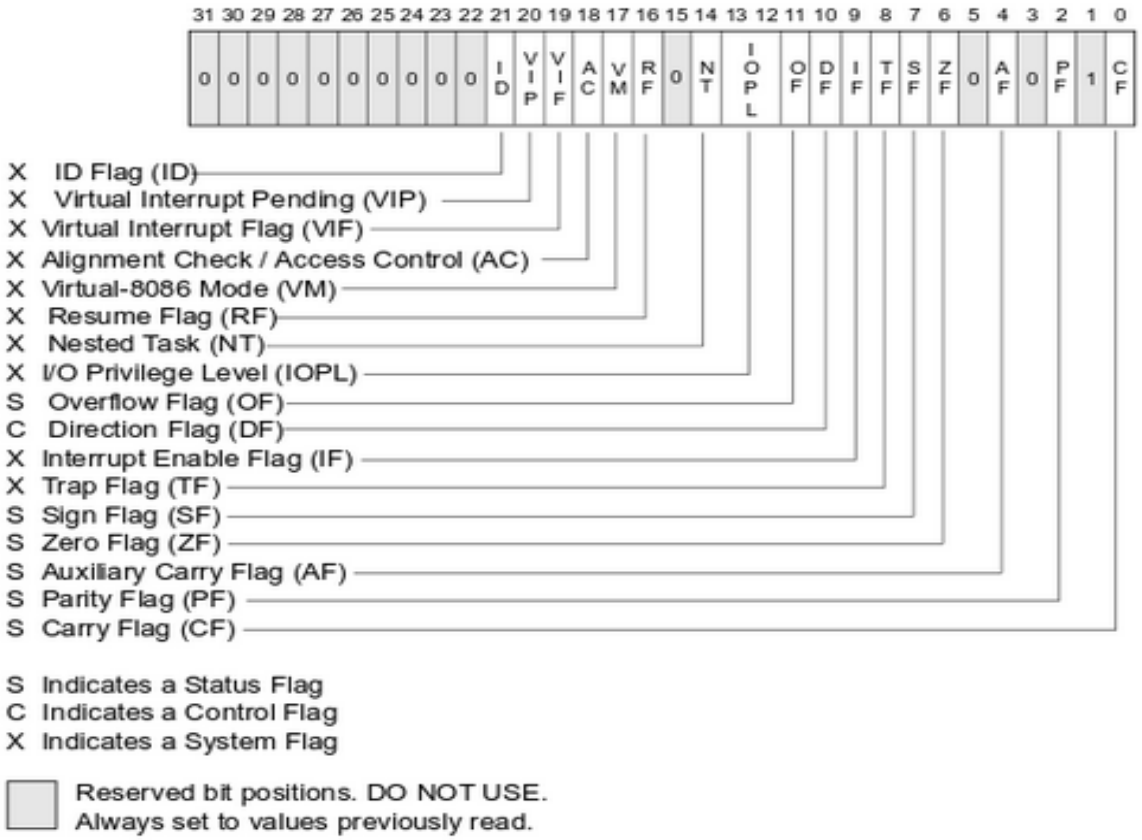


## 1. Outra Perspetiva 2




One way of positioning four 64k byte segments within the 1M byte memory space of an 8086

## SR – Registo do Estado constituído por Flags (indicadores do Estado):




EFLAGS Register