

# iAPX88 Architecture Overview

## Registers, Flags, and Segmented Memory Model

### 1. General Registers (AX, BX, CX, DX):

- AX (Accumulator): Can be divided into AH (high byte) and AL (low byte), and is primarily used for arithmetic and data transfer instructions.
- BX (Base): Primarily used for addressing memory.
- CX (Counter): Used for operations involving loops or counting.
- DX (Destination): Often used in I/O operations.

### 2. Index Registers (SI and DI):

- SI (Source Index) and DI (Destination Index): Used in string operations and memory access, but can also be used for arithmetic or logic operations.

### 3. Special Registers:

- IP (Instruction Pointer): Holds the address of the next instruction to be executed.
- SP (Stack Pointer) & BP (Base Pointer): Involved in managing the stack.
- Segment Registers (CS, DS, SS, ES): These registers point to different areas of memory, managing the segmented memory model.

### 4. Flags Register:

- Consists of individual bits such as Carry (C), Zero (Z), Sign (S), Parity (P), Overflow (O), and others, which track the state of the processor after certain operations.

### 5. Segmented Memory Model:

- Intel introduced this model to provide better memory management by dividing memory into segments like code, data, and stack. Each segment can be accessed via the corresponding segment register (CS, DS, SS, ES), and the offset provides finer control within the segment.

## 6. First Assembly Language Program:

The program demonstrates a basic example in assembly language, where numbers are loaded into registers and summed. Key instructions include 'mov', 'add', and 'int 0x21' (interrupt for program termination in DOS). The program structure is simple, showing the basics of instruction, source, and destination.

This foundational overview of iAPX88 architecture gives insight into the internal workings of Intel processors, register usage, memory handling, and basic assembly language.