Chapter 5: Interrupts for 8086

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5.1. Introduction to Interrupt for 80-86
5.2. Interrupt Vector
5.3. Interrupt Instructions
There are the activities which interrupt a running program.

There are two major types of interrupts

- Hardware generated (derived from a hardware signal)
- Software generated (internally derived from the execution of an instruction)

The response of the microprocessor to an interrupt is to execute a known subroutine/procedure which called Interrupt Sub Routine (ISR)
Introduction to interrupt for 8086

Interrupt Vector

This vector gives us information about the location of an I.S.R. in the memory.
An interrupt vector is a 4-byte number. The first two bytes give us the value of IP (offset) for the I.S.R, where the last two bytes contain the value of CS register.

The physical address (20 bits) is defined by: \( CS*10h + IP \)

The interrupt vectors are located in the first 1K byte area of the memory
Intel reserves the first 32 interrupt vectors for the present and features microprocessor products. The remaining interrupt vectors (32-255) are available for the user.
Example of **MS-DOS** interrupts

- **INT 21h /AH=1** read character from standard input, with echo, result is stored in **AL**. If there is no character in the keyboard buffer, the function waits until any key is pressed.
  
  \[\text{Ex: } \text{MOV AH, 1} \]
  \[\text{INT 21h} \]

- **INT 21h /AH=2** write character to standard output entry. DL register contains the character to write, after execution **AL = DL**.
  
  \[\text{Ex: } \text{MOV AH, 2} \]
  \[\text{MOV DL, ’B’} \]
  \[\text{INT 21h} \]
Interrupt Instructions (contd.)

Example of **MS-DOS** interrupts

- **INT 21h / AH=9** - output of a string at DS:DX. String must be terminated by '\$'.

  Ex: ORG 100h Where msg db “Hello word $”

  MOV DX, offset msg
  MOV AH, 9
  INT 21h
  RET

Example of **BIOS** interrupt

- **INT 16h/ AH = 00h** - get keystroke from keyboard (no echo).
  
  **AH** = BIOS scan code.
  
  **AL** = ASCII character.
  
  (if a keystroke is present, it is removed from the keyboard buffer).