University of Central Punjab

(Incorporated by Ordinance No. XXIV of 2002 promulgated by Government of the Punjab)
FACULTY OF INFORMATION TECHNOLOGY

Computer Organization and Assembly Language

Lab 12	
Topic	1. Software Interrupts

PART 1

Example 1: Printing Character Using Interrupt

```
[org 0x100]
start:   mov ah, 0
int 16h ; wait for any key....
cmp al, 27  ; if key is 'esc' then exit.
je stop
;al contains ascii of pressed key
mov ah, 0Eh ; print it.
int 10h
jmp start
stop:
mov ax,0x4c00
int 21h
```

Example 2: Printing String Using Interrupt

```
[org 0x100]
mov al, 1;update curser after every character printing
mov bh, 0;page 0, means first page
mov bl, 00111011b;attribules
mov cx, 15 ; message size
mov dl, 10 ;row
mov dh, 7  ;col
push cs
pop es
mov bp, msg1
mov ah, 13h
int 10h
mov ax,0x4c00
int 21h
msg1 db " hello, world! "
```

Example 3: (Taking Input from User and display)

```
[org 0x100]
MOV AX, 0xB800
MOV ES, AX; Initializing ES with video memory address

MOV AH, 0; service number
INT 0x16; calling interrupt number 16h
; When you call interrupt 16h with service number 0,
;processor waits for keyboard input.
;When a key is pressed, its ASCII value is stored in AL register.
; Printing the character on screen.
MOV DI, 0; screen location di=0 top left.
MOV AH,07h; attribute byte
STOSW   ; displaying on screen
Mov ax,0x4c00
Int 21h
```

Example 4: (Take input from User until they press Esc)

```
[org 0x100]
MOV AX, 0xB800
MOV ES, AX; Initializing ES with video memory address
XOR DI, DI; screen location di=0 top left.
again:
MOV AH, 0; service number
INT 0x16; calling interrupt number 16h
; When you call interrupt 16h with service number 0,
;processor waits for keyboard input.
;When a key is pressed, its ASCII value is stored in AL register.
; Printing the character on screen.
MOV AH,07h  ; attribute byte
STOSW    ; displaying on screen
cmp al, 0x1b
jne again
mov ax,0x4c00
int 21h
```

Example 5: (Taking Input from User setting cursor position display the character)

```
[org 0x100]
;input interrupt
mov ah,0
int 16h
;setting cursor position interrupt
mov dh, 12
mov dl, 40
mov bh, 0
mov ah, 2
int 10h
;display character interrupt
mov al, '*'
mov ah, 0eh
int 10h
mov ax,0x4c00
int 21h
```
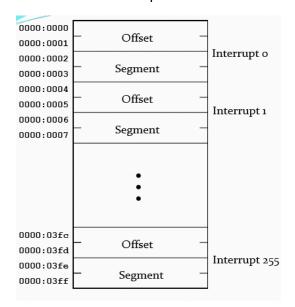
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Interrupt vector table-address mapping

- Offset: n*4 ; offset address of nth interrupt

- Segment: n*4+2 ; base address of nth interrupt

Practice Task

Q1. Write a program which print string of your name and date of birth

Name: Shahbaz Ali

Date of Birth: 01/14/1993

Use interrupt only to display output.

Q2. Write a program which take input string of your name and date of birth using in int16h and print on the screen.

Input

Name: Shahbaz Ali

Date of Birth: 01/14/1993

Output

Name: Shahbaz Ali

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Date of Birth: 01/14/1993

Use interrupt only to display output.

Q3. Write a program which print string 'enter numbers' and takes inputs of four digit decimal number as following and print the sum.

Enter first number: 9876

Enter second number: 1234

Sum is: 11110

Use interrupt only to display and take input.