National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

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OBJECTIVES:

- Perform Hooking and
- Interrupts

Task 1: The following program keeps taking a key from the user and filling the screen with this key. Fix the code such that it exits when the user presses ESC (Escape).

```
; Infinite Key Printing
[org 0x0100]

jmp start

printKey: push ax

                pop bx ; bx=ax

                push es
                push ax
                push cx
                push di

                mov ax, 0xb800

                mov es, ax ; point es to video base

                xor di, di ; point di to top left column
                mov al, bl

                mov ah, 0x07 ; normal attribute

                mov cx, 2000 ; number of screen locations
                cld ; auto increment mode

                rep stosw ; clear the whole screen
                pop di

                pop cx
                pop ax
                pop es
                ret

start: mov ah, 0 ; service 0 – get keystroke

          int 0x16 ; call BIOS keyboard service

          call printKey ; clear the screen
          jmp start

          mov ax, 0x4c00 ; terminate program
          int 0x21
```

Task 2: **Write a code to read a key from the keyboard and displays the next character on screen. For example, if 'e' is pressed then 'f' is displayed.**

Task 3: **Hook int 80h such that whenever Left, Up, Down, and right keys are pressed the asterisk on- screen will mow Left, Up, down, and right respectively.**

 Initially, your start code should do the following:

customISRforINT80h:
  ; check what input key is pressed and move the asterisk on the screen accordingly

Start:
  ; clear screen
  ; print an asterisk in the middle of the screen.
  ; hook int80h
; infinite loop for testing