National University of Computer and Emerging Sciences



Laboratory Manual

for

Computer Organization and Assembly Language Programming

(EL 213)

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| Section | CS-B |
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## Objectives

After performing this lab, students shall be able to:

* Understand hardware interrupts.
* Hook their own codes to a hardware interrupt.
* Learn about Terminate and Stay Resident programs (TSRs).

**Exercise 1:** Write a TSR to clear the screen when CTRL key is pressed and restore it when it is released.

Note: Scan key of CTRL Press is 0x1D.

To reserve specific number of bytes anywhere:

Video: times 10 dw 0 ; this will reserve 20 bytes starting from the label ‘video’ and initialize them to zero.

**Exercise 2:** Write a TSR and which manipulates the given string and then shows it onto the screen according to given rules:

* While left shift is pressed, the word “and” present in string must be replaced by “dna” and whole string is to be displayed onto screen.
* If left shift is released, your screen should be cleared
* While right shift is pressed, the word “has” present in string must be replaced by “sah” and whole string is to be displayed onto screen.
* If left shift is released, your screen should be cleared
* For any other buttons, your code should not do anything and pass the control to Original ISR designed for keyboard interrupts

Scan Code (Left Shift Press): 0x2a

Scan Code (Right Shift Press): 0x36

**Example**:

String: db ‘He has food and drinks’,0

On Left Shift Press: He has food dna drinks

On Right Shift Press: He sah food and drinks