National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

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OBJECTIVES:

- Learn to manipulate and handle Programmable Interrupt Controller (PIC) ports.
- Experiment with interrupt chaining and unhooking interrupts for custom handling.
- Explore the basics of the Programmable Interval Timer (PIT) and its integration with interrupts.
- Gain insight into terminating and staying resident (TSR) programs and their applications.

Task 1: Frequency Counter Using Timer Interrupt

Measure the frequency of an external event using the timer interrupt.

- Hook `INT 08h` and set up a counter for timer ticks.
- Monitor an external input (e.g., a key press) within the interrupt.
- Calculate the frequency of the input events.

Task 2: Change keyboard behavior to display special messages when specific keys are pressed.

- Hook `INT 09h` and check for specific scan codes (e.g., F1 key).
- Display a custom message “My name and roll number are: your_name, your_rollno.”.

Task 3: Chaining Multiple Handlers

Multiple custom handlers can be chained using the **Interrupt Vector Table (IVT).** Handlers can pass control to the next in the chain.

- Create two custom handlers for `INT 08h`.
- Chain them sequentially, each performing a different task; display word counter, and toggle character on screen.