National University of Computer and Emerging Sciences

Laboratory Manual

for

Computer Organization and Assembly Language Programming

Course Instructor	Aleena Ahmad
Lab Instructor	Sana Ejaz
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Department of Computer Science

FAST-NU, Lahore, Pakistan

OBJECTIVES:

- How to manipulate display memory by writing a single character on the screen at a specific location in video memory.
- How to display background color and change intensity.
- How to display String on a specific location.
- How to move a string from one location in memory to another.

Instructions:

> 1. **Submit work in a single Word file with screenshots of meaningful results.**
>
> 2. **Press F2 if you want to step over the function Call. F1 will step into the function.**
>
> 3. **Use DOSBox's memory viewer to check the video memory. You can access video memory starting from 0xB800 to see the changes made by your program.**

Command to run: > nasm -f bin -o myprogram.com myprogram.asm
> myprogram.com

Task 1: Write a program to place the character 'A' at the top-left corner of the screen (row 0, column 0).
    a) Display the character 'A' with white text on a blue background.
    b) Display 'A' with a Blue Background and Increased Intensity of white text.

Video memory for text mode starts at the address `0xB800`. Each character on the screen is represented by two bytes: the first byte represents the ASCII code of the character, and the second byte represents its color.

Color attributes: use their HEX accordingly

$$0100 = \text{Red} ; \qquad R$$
$$0010 = \text{Green} ; \qquad G$$
$$0001 = \text{Blue} ; \qquad B$$

$$0000 = \text{Black}$$
$$0111 = \text{White}$$
$$1000 = \text{Intensity}$$

Combine Intensity with colors where it seems fit.

Task 2: Write a program to display "HELLO" starting at the second row (row 1), and third column (column 2). Use white text on a black background.

Task 3: Write a Program to Fill Memory with a Character Using STOS