National University of Computer and Emerging Sciences



Laboratory Manual

for

Computer Organization and Assembly Language Programming

(EL 213)

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| Section | D |
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## Objectives

After performing this lab, students shall be able to:

* Learn masking and bit manipulation.
* Rotate and Shift numbers.

**Exercise 1: [Bit Manipulation]** Calculate the number of one bits in BX and complement an equal number of least significant bits in AX using MASK. HINT: Use the XOR instruction.

**Sample Run:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Initial value of BX** | **Total No of 1 Bits in BX** | **Initial value of AX** | **AX after Complementing 7 least significant bits** |
| 1011 0001 1000 1001 | 7 | 1010 1011 1**010 0101** | 1010 1011 1**101 1010** |

**Exercise 2:** You need to perform bit by bit comparison of two words. If the two words are equal then dx =1 otherwise, dx =0.

**Exercise 3:** Declare a 32byte buffer containing random data. Consider for this problem that the bits in these 32 bytes are numbered from 0 to 255. Declare another byte that contains the starting bit number. Write a program to copy the byte starting at this starting bit number in the AX register. Be careful that the starting bit number may not be a multiple of 8 and therefore the bits of the desired byte will be split into two bytes.