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**computer organization & architecture**

Lab Report no. 3

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EL-B2

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**Section:** EE-B **Lab:** EL-B2

MEMORY SYSTEM

**Introduction:**

one of the following methods of addressing (also known as byte ordering) is used in most of the machines.

**Big Endian**– the higher byte is stored at lower memory address (i.e. Big Byte first). MIPS, Apple, Sun SPARC are some of the machines in this class.

**Little Endian**- the lower byte is stored at lower memory address (i.e. Little Byte first). Intel’s machines use little endian.

**Objective:**

* To be able to do 32-bit computations using 16-bit registers.
* To learn the x86 memory system segmentation.

**Design/Procedure:**

We had done 3 exercise in this lab

* The first 2 exercises were very simple and just for practice purpose. These were done using calculator and then confirming the answer according to the concept of the memory addressing theory.
* In 3rd exercise we moved data from register to direct memory address and from direct address to register. Data from 1st memory location to 2nd memory location cannot be moved directly. Therefore, registers are used as an intermediate.
* In 4th exercise we used add command to for 32-bit increment using two 16-bit registers. Adding 1 in register A and 0 in register B. Whenever Register A is overflowed, carry becomes 1 and is added to register B.

Conclusion:

In this lab we got familiar with memory structuring on the hardware level.

Application:

* Memory organization plays a key role in defining the performance and computer architecture.
* Understanding the needs of a system is the basis on which memory system is designed for an embedded system.

**POST LAB**

[ORG 0x0100]

MOV AX, 0xFFFF ;lower 16-bit for first number

MOV BX, 0x0000 ;higher 16-bit for first number

MOV CX, 0x0001 ;lower 16-bit for second number

MOV DX, 0x0000 ;higher 16-bit for second number

ADD AX, CX ;addition of lower bits

ADC BX, DX ;addition of higher bits with carry flag

MOV AX, 0x4C00 ; TERMINATE PROGRAM

INT 0x21