

Assignment 2 (IA32 Environment)

1. Storage of multibyte data in Intel Microprocessors is achieved using *little endian* format in which the lowest byte in memory represent the least significant byte and the highest byte represent the most significant byte. For example the number 01234567H stored in memory address 100H to 103H will be represented in 4 bytes as follows:

Memory Location	100H	101H	102H	103H
Content	67	45	23	01

- a. Represent the previous number in same addresses using *big endian* format which is the reverse of *little endian* format.
 - b. Write a small assembly code segment to convert between the two formats
2. Find the content of segment and offset registers to access the following locations in memory (multiple solutions exist):
- a. 01234H b. 43324H c. 22H
3. How many segments contain the physical addresses 15H, 32H, 234H in real and protected mode addressing?
4. What is the maximum number of overlapping segments that can exist in the 8086 real address mode?
5. If the processor is in Intel 64 mode, what is the address accessed by each of the following registers (Assume CS=0029H, DS=04F2H, SS=03ABH):
- a. EBX = 00110F43H
 - b. EIP=00110F43H
 - c. ESP=00110F43H
6. What is the difference between a selector and a descriptor in protected mode addressing?
7. Write the content of the descriptor accessed by DS to access a segment starting at 01234H in main memory using both 80286 and 80386 descriptor formats.
8. What is the reason for having both GDTR and LDTR?
9. What are the differences between real mode and protected mode segments?
10. Suppose DS=1000H, SS=2000H, BP=1000H, DI=0100H. Determine the memory address RANGE accessed by each of the following instructions (IF ANY):
- a. MOV AL,[BP+DI]
 - b. MOV CX,[DI]
 - c. MOV DX,01H
 - d. MOV EDX,[BP]
 - e. MOV AX,[01H]