METRO STATE UNIVERSITY

ICS 232 Computer Organization & Architecture
Homework 7 – Irvine Chapter 2 & 4 - 10 points
Due Date: 6/28/2023

Name:

Note: Please post your homework to ICS232 D2L on or before the due date.

Irvine Chapter 2 - x86 Processor Architecture
Irvine Chapter 4 – Data Transfers, Addressing, Arithmetic

1. In a MOV instruction, which operand is the source and which is the destination?
   - move from source to destination
   - Syntax: MOV destination, source
   - First operand is the destination, second operand is the source

2. (True/False): The EIP register cannot be the destination operand of a MOV instruction.

- true

3. In the operand notation used by Intel, what does reg/mem32 indicate?
   - it must be a register of any size, or 32-bit memory operand

4. What will be the value of the destination operand after each of these instructions?

```
var2 WORD  1000h, 2000h, 3000h, 4000h
var3 SWORD -16, -42
var4 DWORD 12345

     MOV  AX, var2              a. 1000h
     MOV  AX, [var2 + 4]        b. 4000h
     MOV  AX, var3              c. -16
     MOV  AX, [var3 - 2]        d. -16
     MOV  AX, LENGTHOF var2     e. 4
```

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```
MOV  AX, SIZEOF var3     f. 6
```

5. Write instructions that subtract val4 from val2.
   - sub val2, val4

6. What will be in the registers as executing this code

```
myBytes   BYTE 10h,20h,30h,40h
myWords   WORD 8Ah,3Bh,72h,44h,66h
myDoubles DWORD 1,2,3,4,5
myPointer DWORD myDoubles

          mov  esi,OFFSET myBytes
          mov  al,[esi]                ; a. AL = 4
          mov  al,[esi+3]              ; b. AL = 7
          mov  esi,OFFSET myWords + 2
          mov  ax,[esi]                ; c. AX = 4
          mov  edi,8
          mov  edx,[myDoubles + edi]   ; d. EDX = 5
          mov  edx,myDoubles[edi]      ; e. EDX = 7
          mov  ebx,myPointer
          mov  eax,[ebx+4]             ; f. EAX = 5
```

7. What will be the final value of EAX in this example?

```
          mov  eax,0
          mov  ecx,10    ; outer loop counter
L1:       mov  eax,3
          mov  ecx,5     ; inner loop counter
L2:       add  eax,5
          loop L2        ; repeat inner loop
          loop L1        ; repeat outer loop
          Outer loop will continue to execute
```

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Prepare for next class by reading lecture notes Irvine Chapter 5 and 6

Complete Project 1

Continue working on Your Group Project

Optional Questions:

1. Now that the semester is about one-half way complete, do you have any comments about the first half and how would you like the second half to be improved?