ICS 232 Computer Organization & Architecture
Homework 8 – Irvine Chapter 5 & 6 - 10 points
Due Date: 7/5/2023

Name: Key

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

Irvine Chapter 5 – Procedures
Irvine Chapter 6 – Conditional Processing

1. Show the value of AL for the instructions below:

```
mov   al,7Ah
not   al          a.  85h
mov   al,3Dh
and   al,74h      b.  34h
mov   al,9Bh
or    al,35h      c.  BFh
mov   al,72h
xor   al,0DCh     d.  AEh
```

2. Will the following code jump to the label named target?

```
mov   ax,8109h
cmp   ax,26h
jg    target
```

a. No (8109h is negative, and 26h is positive)

```
mov   ax,8109h
cmp   ax,26h
ja    target
```

b. Yes (unsigned compare)

```
mov   eax,8109h
cmp   eax,26h
jg    target
```

c. Yes (32-bit comparison)

```
mov   bx,8109h
movsx eax,bx
cmp   eax,26h
jg    target
```

d. No (8109h is negative, and 26h is positive)

3. Write instructions that jump to label L1 when the unsigned integer in DX is less than or equal to the integer in CX.

```
cmp   dx,cx
jbe   L1
```

4. Write instructions that jump to label L2 when the signed integer in AX is greater than the integer in CX.

```
cmp   ax,cx
jg    L2
```

5. Using the LOOP write the code to sum the positive entries in an array of SWORDs.

```
.data
array     SWORD     -3,-6,-1,-10,10,30,40,4

.code

      mov  esi,OFFSET array
      mov  ecx,LENGTHOF array
      xor  ax,ax                ; initialize sum
L1:   mov  bx,WORD PTR [esi]    ; load next entry
      test bx,bx                ; test sign bit
      js   L2                   ; jump if negative
      add  ax,bx                ; compute sum
```

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```
L2:  add  esi,TYPE array        ; move to next position
     loop L1                    ; continue loop
quit:
```

6. Implement the following pseudocode in assembly language assuming signed numbers:

```
if (edx <= ecx)
     x = 1;
else
     x = 2;

     cmp  edx,ecx
     jg   L1
     mov  X,1
     jmp  next

L1:  mov  X,2
next:
```

7. Implement the following pseudocode in assembly language assuming unsigned numbers:

```
if ((val1 > ecx) && (ecx > edx))
     x = 1;
else
     x = 2;

     cmp  val1,ecx
     jna  L1
     cmp  ecx,edx
     jna  L1
     mov  x,1
     jmp  next
L1:  mov  x,2
next:
```

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Prepare for next class by reading lecture notes Irvine Chapter 7 and 8

Continue working on Your Group Project