

Name:

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COE 205, Term 033
Computer Organization & Assembly Programming

Quiz# 5 Solution

Date: Monday, July 26, 2004

Q1. Write a program to count the number of 1's in register AL and store the count in register AH without changing the content of register AL.

```
XOR AH, AH
MOV CX, 8
Next: ROL AL, 1           ; ROR AL, 1 can also be used
      ADC AH, 0
      LOOP Next
```

Another Solution:

```
XOR AH, AH
MOV CX, 8
Next: ROL AL, 1           ; ROR AL, 1 can also be used
      JNC Skip
      INC AH
Skip: LOOP Next
```

Q2. Write a program to rearrange the bits of register AL such that the even bits and odd bits exchange places i.e. the register format becomes $A_6A_7A_4A_5A_2A_3A_0A_1$.

```
MOV AH, AL
AND AH, 01010101B      ; AH contains even bits
AND AL, 10101010B      ; AL contains odd bits
SHL AH, 1               ; even bits shifted to odd bits position
SHR AL, 1               ; odd bits shifted to even bits position
OR AL, AH               ; bits grouped together. You can also use ADD AL, AH
```