

Name:

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COE 205, Term 101
Computer Organization & Assembly Programming
Quiz#4 Solution

Date: Monday, Dec. 6, 2010

(Q1) Fill the blank in each of the following:

(1) Assume that $ESP=0000022EH$ and $EAX=1F2E3D4CH$. Assume that the address of MPROC is 0030FEA3. After executing the instruction sequence {PUSH EAX, CALL MPROC}, the content of $ESP=\underline{ESP-8=0000022EH-8=00000226H}$.

(2) Assume that $AX=4321H$ and $BX=5678H$. After executing the following sequence of instructions, the content of $EAX=\underline{43215678}$.

PUSH AX
PUSH BX
POP EAX

(3) Assume that $ESP=00000100H$. After executing the instruction RET 4, the content of $ESP=\underline{ESP+8=00000100H+8=00000108H}$.

Q2. Write a procedure that computes and displays the sum of an array of integers. Assume that the array address and number of elements in the array are passed as parameters in the stack. The procedure should preserve the content of all registers used. Then, call the procedure to display the sum of the array given below:

Array1 DWORD 1, 2, 3, 4, 5

.code

main PROC

```
    push offset Array1
    push lengthof Array1
    call ArraySum
    exit
```

main ENDP

ArraySum PROC

```
    push ebp                ; save ebp
    mov  ebp, esp
    push ecx                ; save registers
    push esi
    push eax
    mov  ecx, [ebp+8]       ; get array length from stack
    mov  esi, [ebp+12]     ; get array address from stack
    mov  eax, 0             ; set the sum to zero
L1:
    add  eax, [esi]         ; add each integer to sum
    add  esi, 4             ; point to next integer
    loop L1                ; repeat for array size
    call WriteInt          ; display sum
    pop  eax                ; restore registers
    pop  esi
    pop  ecx
    pop  ebp
    ret  8                  ; return and free parameters
```

ArraySum ENDP