

Name: KEY

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COE 205, Term 042
Computer Organization & Assembly Programming
Quiz#6

Date: Sunday, May 8, 2005

Q1. Write a macro, **SAVEREG**, to save the content of any number of specified registers on the stack, and another macro, **RESTREG**, to restore the content of any number of specified registers from the stack. For example, to save the contents of registers AX and BX, the macro will be invoked by the command **SAVEREG <AX, BX>** and to restore the contents of registers AX and BX, the macro will be invoked by the command **RESTREG <BX, AX>**.

```
SAVEREG    MACRO      REGS
            IRP D, <REGS>
            PUSH D
            ENDM
        ENDM

RESTREG    MACRO      REGS
            IRP D, <REGS>
            POP D
            ENDM
        ENDM
```

Q2. Write a macro to exchange two memory operands such that the two operands can be either **byte** or **word** operands. Use the macros defined in Q1 to make sure that the content of registers used in the macro is restored after executing the macro. Hint: the **TYPE** operator returns the number of bytes reserved for the operand in memory. The next table shows the values returned by the type operator.

Type of Memory Operand	Value Returned
BYTE	1
WORD	2
DWORD	4

```
MXCHG    MACRO    operand1, operand2
            IF (TYPE operand1) EQ 1 ; BYTE operands
                XCHG AL, operand1
                XCHG AL, operand2
                XCHG AL, operand1
            ELSE ; WORD operands
                XCHG AX, operand1
                XCHG AX, operand2
                XCHG AX, operand1
            ENDF
        ENDM
```