Assignment 2
Assembly Language Programming

due
Friday, October 9 1998
12:30 PM

Question 1

Write an 80x86 assembly-language program that prints the values of the first 16 interrupt vectors. Print one vector on each line in the format SSSS:OOOO where SSSS and OOOO represent the interrupt vector's CS and IP values (respectively) in hex.

Your code may only make use of two DOS interrupts: 21H function 2 (AH=2) (to print a character) and 20H (to return control to DOS).

Your code should define and use at least two subroutines: one to print the hex digit corresponding to a value between 0 and 15 that is passed in AL, and one to print a four-digit hex number corresponding to the value passed in AX.

Comments are particularly important when writing in assembly language. The comments in your code must include at least: a file header with the file name, the purpose of the code, your name, student number, and date; a function header for each function describing the purpose of the function, the inputs, outputs, and registers altered by each function (if any); and a short in-line comment for each part of each function explaining the purpose of that section of code. The in-line comments should be a high-level explanation of your algorithm similar to pseudo-code rather than an explanation of the effects of each instruction. For example, use:

```
xor     ax,ax       ; reset count to zero
mov     count,ax
```

Do *NOT* (!) write comments such as this:

```
xor     ax,ax       ; exclusive-or AX with AX
mov     count,ax    ; store AX in location count
```

or even

```
xor     ax,ax       ; set AX to zero
mov     count,ax    ; store AX in count
```

References and summaries of the 80x86 machine-language instructions and DOS interrupts may be obtained from the Web (see the course Web page for details). Note that the syntax of the SHR instruction given in the lecture notes is incorrect – the syntax should be SHR AX,CL where the value of register CL is the number of bits to shift AX right. For example:

```
mov cl,12       ; get first hex digit
shr ax,cl
and ax,0fh
```

Assemble and test your code using the free valar-row DOS assembler and linker available from the course web page.

Submit a listing of your code and a print-out of its output. You can redirect the output of your program to a file using '>' (e.g. asg2 >*filename*).

Bonus marks will be awarded for the shortest and for the easiest-to-read solutions.