EE334 Computer Architecture **Spring 2004**
Lab 4: Decimal to Hexadecimal and Binary Conversion

Please write a program that implements a conversion from decimal numbers into either binary or hexadecimal. The input to your program will be a decimal number and the type of conversion that is desired –either binary (B) or hexadecimal (H).

Implement this program using the following procedures (subroutines):
dec_to_hex: This procedure converts a number from decimal to hexadecimal.
dec_to_bin: This procedure converts a number from decimal to binary.
print_ascii: This procedure print on the console the ascii character 0,1,…A,..F

For this program you will need to use bitwise operations and shifts. Below is a pseudo-program that may help you to write your MIPS assembly code.

```
Program dec_to_hex_bin_conv
   {    get_inputs (number, conversion)
        if convertion = "H"
                call dec_to_hex (number)
                else call dec_to_bin (number)
   }

        procedure dec_to_hex (number)
        {   t_number = number
            N=4
           while (N>0  {
                t_number = rotate_to_left_by_4 (t_number)
                m_number = mask_in_4_least_significant_bits (t_number)
                print_ascii (m_number)
                N=N-1  }
        }
```

REPORT
Please include the following items in your report.

1. Explain how your program works. You may use a flow chart, pseudo C program, or other way to explain the program.
2. Compare your assembly code with the program that is executed by the machine. If you have used pseudo-instructions, please list them here and provide the translation onto assembly.
3. Show examples that test your code
4. Conclusion. Explain what you learned here and what was difficult about this lab
5. A print out of your program.
   # ***Include comments in your program.*** **Points will be deducted if there are**
   # no comments that help understand your program.

SHOW AND TELL. Please give a demonstration of your program to your TA.

REPORT IS DUE: February 23 (in class). {late reports will get 15 points off}