CS113 - Program Design and Algorithms
Lab Assignment #3
Summer 2002

The purpose of this exercise is to help reinforce your understanding of number systems and the conversion between bases.

You are to write a program that will convert values between decimal (base 10) and binary, octal, and hexadecimal. In particular, your program should accept a *character string* containing numeric digits (i.e., 0-1 for binary, 0-7 for octal, 0-9 for decimal, and 0-9, A-F for hexadecimal), and should output the decimal (base 10), binary, octal and hex values represented by the string. Your program should be able to handle a radix ("decimal") point and fractional values, in addition to the usual integer values.

The base of the input number should be indicated with a letter following the number:

- A **B** to indicate binary. For example, `001011.01B`
- An **O** to indicate octal. For example, `4137.36O`
- A **D** or none to indicate decimal. For example, `183.7` or `183.7D`
- An **H** to indicate hexadecimal. For example, `A31.FH`

When outputting the number in the different bases, use the following fixed number of places behind the radix point:

- 12 digits for binary,
- 4 digits for octal,
- 4 digits for decimal,
- 3 digits for hexadecimal.

NOTE: Parts of this program will be used in a later exercise. As you design the program, try to make it as versatile and general-purpose as possible, as this will make it easier to adapt in a following application.