

Unit B0: Number Systems, 9/16/03

Note: Some of you are already familiar with this topic. If you feel that you can *teach* this material to other students, send me e-mail. You will be exempt from this exercise (with full credit). Otherwise, this is a required component of the Module B evaluation.

Exercise 1: Conversion

Read the on-line document “Number Systems” available at:

<http://www.tcnj.edu/~komagata/cmssc210/03f/misc/NumberSystems.pdf> (clickable)

Explain how to do the following conversion. You may check your answer using a calculator or a calculator simulator on a computer. Note that all numbers are positive and you do not need to worry about negative numbers.

- A. Convert 10101_2 to the corresponding decimal number
- B. Convert 57_{10} to the corresponding binary number
- C. Convert 57_9 to the corresponding decimal number
- D. Convert 57_{10} to the corresponding base-7 number

Exercise 2: Number Systems in Reality

Answer the following questions:

- A. Why are multiple number systems used? Wouldn't it be more convenient if we can deal with just one, say, decimal or binary?
- B. Why is the hexadecimal number system used to represent various aspects of computer architecture, e.g., memory location?
- C. The Chinese language uses thousands of characters. (1) Explain why the ASCII code cannot support these characters. (2) Also explain whether a newer character representation scheme called Unicode that uses 2 bytes would be adequate to support Chinese characters.

<End>