

AP Computer Science Number Systems Mini-Project

Mr. Lew

For this project you will explain the basic principles of the decimal, binary, octal, and hexadecimal number systems which are widely used by computer scientists and electrical and computer engineers. In addition, you will show how to algorithmically convert from one system to another. On your presentation day you will present the following:

Powerpoint presentation (which will include the following slides)

- a. "Description" slide – This slide describes four most widely used number systems (decimal, binary, octal, and hexadecimal). Tables and/or diagrams should be used to show the correlation between numbers in each system. This section should include a description of how conversions can be made from one system to another.
- b. Role Play – This slide will introduce the role play. The role play will use member of the class to represent "bits" of a binary number. Members of the class will either stand up or sit down to represent a "1" or "0", respectively. You may expand on this idea to help explain the other number systems.
- c. "Java code Demonstration" slide – Here you will demonstrate a the various number systems in a sample program:
 - i. the program implements an algorithmic conversion from decimal to binary.
 - ii. the program implements an algorithmic conversion from binary to hexadecimal.
 - iii. the program implements an algorithmic conversion from binary to octal.
- d. "Advantages and disadvantages" slide – Here you discuss the advantages and disadvantages of using the various number systems.
- e. "Memory issues" slide – discuss how memory is "addressed" using the binary and hexadecimal number systems, e.g. how is a GB or TB of memory addressed using the hexadecimal number system.