Lab 5

Representation: Testing Big Endian Vs. Little Endian

Purpose

To learn how the integer representation used by the underlying hardware affects programming and data layout.

Background Reading And Preparation

Read Chapter 3 to learn about big endian and little endian integer representations and the size of an integer.

Overview

Write a C program that examines data stored in memory to determine whether a computer uses big endian or little endian integer representation.

Procedure And Details (checkmark as each is completed)

_____ 1. Write a C program that creates an array of bytes in memory, fills the array with zero, and then stores integer 0x04030201 in the middle of the array.

_____ 2. Examine the bytes in the array to determine whether the integer is stored in big endian or little endian order.

_____ 3. Compile and run the program (without changes to the source code) on both a big endian and little endian computer, and verify that it correctly announces the integer type.

_____ 4. Add code to the program to determine the integer size (hint: start with integer 1 and shift left until the value is zero).

_____ 5. Compile and run the program (without changes to the source code) on both a thirty-two bit and a sixty-four bit computer, and verify the program correctly announces the integer size.

Optional Extensions (checkmark as each is completed)

_____ 6. Find an alternate method of determining the integer size.

_____ 7. Implement the alternate method to determine integer size, and verify that the program works correctly.

_____ 8. Extend the program to announce the integer format (i.e., one's complement or two's complement).

Notes