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Course: CSCI – P538
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Assignment title: Lab 1: C Programming Primer and Parsing Network Packets

Section 2:

1. What is the bit-width of your CPU? 32bit or 64bit? How can you tell from the output of this program?
Answer: The bit-width of a CPU is the smallest amount of data that it can process. Example, for a 32-bit system, the CPU can process not more than 32 bits. The bit-width of my CPU is 64 bits. In a 64-bit system, I am able to use long data type with bytes and octets in the C programs.

2. What is the largest signed short, int, and long? What is the largest unsigned values?
Answer: long is the largest with size ranging from $-(2^{63})$ to $(2^{63}-1)$* for signed long.

3. Explain casting in C. Does it affect the underlying data or just the interpretation of that data?
Answer: Type casting in C will instruct the compiler to use a variable as another data type and not its core data type. Example, char p[1] can be type casted as printf("int p: %d %d", char p[0], char p[1]); if p=01; output will be-> int p: 0 1

Only the interpretation of data is affected.

4. Hexadecimal notation (or hex) is incredibly useful tool for programmers, and you've seen an example of that above where we embedded data into a string using hex. Why do you think we use hex so readily? How much information can two hex digits store? How much information can one byte store? What is 1024 in hex? What is 1025 in hex?
Answer: One can use 16 different symbols from 0-9 and a-f in a hexadecimal number. So large numbers can be represented in the hexadecimal format.
Two hex digits can store 16+16 = 32 bits of data.
One byte can store 8 bits of data.
1024 is 0x400 in hex.
1025 is 0x401 in hex.

Sources:
1) Integer (computer science)
http://en.wikipedia.org/wiki/Integer_%28computer_science%29

2) HOW TO CONVERT ANY DECIMAL NUMBER TO HEX
http://www.webelfin.com/webelfindesign/dechex.html

Citation:
*Integer (computer science)
http://en.wikipedia.org/wiki/Integer_%28computer_science%29