

**Lab #1: Data Types & Conversions**

**Assigned Date: Monday, August 26th, 2019**

**Due Date: 11:59 pm, Sunday, September 1st, 2019**

**Problem Statement:** The goal is to perform some basic conversions to ASCII, EBCIDEC, decimal, binary, and hexadecimal. Search for these conversion tables / definitions in your browser. You should understand how to mathematically make these conversions on your own.

**Instructions:** Answer the following questions:

1. Define hexadecimal notation. (2 points)

It is a system that consists of 16 symbols or what we call it base 16. Every four digit from binary number is a one digit from hexadecimal.

1. Define binary notation. (2 points)

Binary is a system that allows you to write only using two digits and they are 0 and 1. Just like a switch has off and on. This system is used in the computer. Each digit of the binary has two values in the facts; every single digit has a value as much as the one next to it (to the right side).

1. What is ASCII? (2 points)

It stands for **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange. So it is a code that shows the characters using numbers. So every character is assigned to a number between 0 and 127. By the way upper and lower case will be assigned into a different number.

1. What is EBCIDEC? (2 points)

It stands for Extended Binary Coded Decimal Interchange Code. It is used mostly for IBM specially on midrange computers.It is 8 bit.

1. Convert the phrase **“Hello, friend!”** to decimal using an ASCII table (perhaps http://www.asciitable.com/). You can exclude the quotation marks, but remember to include the punctuation and spaces. (7 points)

72 101 108 108 111 44 32 102 114 105 101 110 100 33

1. Convert the phrase **“Hello, friend!”** to decimal using an EBCIDIC table (http://ascii-table.com/ebcdic-table.php). You can exclude the quotation marks, but remember to include the punctuation and spaces. (7 points)

200 133 147 147 150 107 64 134 153 137 133 149 132 90

1. Convert the phrase **“This class is great!”** to hexadecimal using an ASCII table. You can exclude the quotation marks, but remember to include the punctuation and spaces. (10 points)

E3 88 89 A2 40 83 93 81 A2 A2 40 89 A2 40 87 99 85 81 E3 5A

1. Convert the hexadecimal number **“ff”** to binary and decimal. (2 points)

binary: 11111111

decimal: 255

1. Convert the network mask **255.255.255.128** to hexadecimal. Ignore the dots. (4 points)

0xffffff80

1. Convert the binary number **00101101** to decimal and hexadecimal. (2 points)

decimal: 45

hexadecimal: 2D

1. Using Device Manager (Windows) or System Info (Mac), find an example of where a hexadecimal number is represented. Explain what you found. (2 points)

The mac address is in hex.

1. What is your major? (If you haven’t declared a major yet, what do you plan to major in?) (1 point)

My major is Cybersecurity. It is important to help us to connect to the network segment.

1. Find an example of how data conversion or its representation apply to your career field. (For example, explain how hex is relevant to forensics, game programming, CSI or Cybersecurity.) Provide the reference to where you found the information. This should just be a short summary, around 500 words. (4 points)

Hexadecimal is an easy way to present data using numbers. Most of the time the people who programer use it to use the computer and esplicy cyber security. So that does not mean that computers work in hex, they work in binary. Cyber security uses it to store information so in that way they will use less space. Also if they want to write a lot of the binary numbers they use hex to write with less digits.

1. Upload your answers to Canvas as a Word document. (1 point)

**references:**

1. (<http://ascii-table.com/ebcdic-table.php>
2. <http://www.asciitable.com/>
3. <https://www.w3schools.com/charsets/ref_html_ascii.asp#:~:text=ASCII%20is%20a%207%2Dbit,are%20all%20based%20on%20ASCII>.
4. <https://www.ibm.com/support/knowledgecenter/SSGH4D_16.1.0/com.ibm.xlf161.aix.doc/language_ref/asciit.html>
5. <https://www.researchgate.net/post/Why_we_are_using_HEXADECIMAL_values_for_computer_addressing#:~:text=The%20main%20reason%20why%20we,an%20example%2C%20using%20a%20byte>.
6. <https://teachcomputerscience.com/uses-of-hexadecimal/#:~:text=It%20allows%20you%20to%20store,to%20read%2C%20write%20and%20understand>.