Monday, April 22, 2019

Agenda

- Journal Intro

- Binary Numbering System
  - review
  - challenge

- MC Questions from Mock Exam

- Journal Conclusion

Objectives
Content: I will convert between **binary** and **decimal** representations of numbers.
Social: I will participate in class activities.
Language: I will write in my journal about applications of **binary** through **bit** representation.

Review Binary

- What is it?
- How does it work?

$x^0 = 1$

11011101

$$100 \quad 10 \quad 1$$
$$10^2 \quad 10^1 \quad 10^0$$
$$\downarrow \quad \downarrow \quad \downarrow$$
$$1 \;\; 0 \;\; 9 \quad \text{Decimal form}$$

$$100 + 0 + 9$$

128 64 32 16 8 4 2 1
$2^7 \quad 2^6 \quad 2^5 \quad 2^4 \quad 2^3 \quad 2^2 \quad 2^1 \quad 2^0$

0 1 1 0 1 1 0 1

$$0 + 64 + 32 + 0 + 8 + 4 + 0 + 1$$

(109)

$$
\begin{array}{r}
221 \\
-128 \\
\hline
93 \\
64 \\
\hline
29 \\
16 \\
\hline
13 \\
8 \\
\hline
5 \\
4 \\
\hline
1
\end{array}
$$

Practice

http://bit.ly/GameBin

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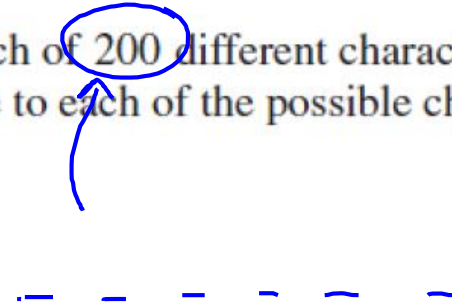
MC Question

A text-editing application uses binary sequences to represent each of 200 different characters. What is the minimum number of bits needed to assign a unique bit sequence to each of the possible characters?

(A) 4

(B) 6

(C) 7

(D) 8

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MC Question #49

A computer program uses 4 bits to represent nonnegative integers. Which of the following statements describe a possible result when the program uses this number representation?

F I. The operation 4 + 8 will result in an overflow error.

T II. The operation 7 + 10 will result in an overflow error.   17

F III. The operation 12 + 3 will result in an overflow error.   15

12 →   8 4 2 1
         1 1 0 0

(A) I only

(B) II only

(C) II and III only

(D) I, II, and III

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Closing Journal Entry

Explain in your own words the process for converting between decimal and binary and any restrictions in the size of the binary number.