Peer Instruction #1: Numerical Representation

Peer Instruction: The process

- A (somewhat) difficult question will be projected.
- Individually choose an answer and submit.
- Instructor will close poll, without showing results.
- Discuss your answer with your peers.
- In your group, choose an answer and submit.
- Instructor will lead discussion, and show results.

What is the minimum number of bits needed to represent 492 distinct values? How many bit patterns are leftover?

A. 7-bits, no patterns unused
B. 8-bits, 8 patterns unused
C. 9-bits, 20 patterns unused
D. 10-bits, 532 patterns unused
E. None of the above

Bit Patterns

What are the binary and hexadecimal equivalents of the decimal number 98, assuming 8-bit precision?

A. 01010010, 0x62
B. 01100010, 0x62
C. 01010010, 0x52
D. 01100010, 0x52
E. None of the above

Number Conversion

What is 0xABCD in binary, and 1101 0010 0110 1110 in hexadecimal, assuming 16-bit precision?

A. 1011 1100 1101 1110, 0xB26D
B. 1010 1011 1100 1101, 0xC26F
C. 1001 1010 1011 1100, 0xD26E
D. 1010 1011 1100 1101, 0xD26F
E. None of the above

Number Conversion

What is the number minus 7 in binary, using the 1's and 2's complement format, assuming 5-bit precision?

A. 10111, 11000
B. 11000, 11001
C. 11001, 11010
D. 11010, 11011
E. All of the above

1's and 2's Complement

Which binary equation matches decimal 12 – 2 = 10, assuming 5-bits of precision and 2's complement?

A. 01100 + 11110 = 01010
B. 01100 – 00010 = 01010
C. A and B
D. None of the above

Binary Math

What is the correct translation of the string “cs 270” into ASCII codes, using decimal values?

A. 99 114 32 50 55 48
B. 99 115 50 55 48
C. 99 115 32 50 55 48
D. 63 73 20 32 37 30
E. None of the above

ASCII Conversion

What is the decimal value of the binary number shown below, in IEEE single-precision format (*float)?*

0 10000000 11000000000000000000000

A. 1.5

B. 2.5

C. 3.5

D. 4.5

E. None of the above

Floating Point Format