# Peer Instruction #2: Numerical Representation (reprise)

# What are the binary and hexadecimal equivalents of the decimal number 137, assuming 8-bit precision, unsigned?

A. 10001001, 0x89
B. 10000111, 0x87
C. 10000101, 0x85
D. 10000011, 0x83
E. None of the above

Number Conversion

## Convert the number -55 in decimal to 2's complement binary, assuming 12-bits of precision.

A. 011111001001
B. 111111001000
C. 111111001001
D. 111111001010
E. None of the above

Number Conversion

# How many bits are needed to represent -128 to 128 in binary (2's complement) and how many patterns are unused?

A. 7-bits, no patterns unused
B. 8-bits, no patterns unused
C. 8-bits, 255 patterns unused
D. 9-bits, 255 patterns unused
E. None of the above

Bit Patterns

# How do you convert an ASCII digit to its equivalent decimal value?

A. Subtract 0x30
B. Add 0x30
C. Shift right by 6-bits
D. Shift left by 6-bits
E. Cannot be done easily

ASCII Conversion

# What is the hexadecimal representation in IEEE single-precision format of the decimal number shown below?

1.0

A. 0x3f700000

B. 0x3f780000

C. 0x3f800000

D. 0x3fF80000

E. None of the above

Single Precision

# What is the binary representation in IEEE single-precision format of the decimal number shown below?

17.375

A. 0 10000011 00010110000000000000000
B. 0 10000011 00101100000000000000000
C. 0 10000010 00010110000000000000000
D. 0 10000010 00101100000000000000000
E. None of the above

Single Precision

The IEEE half-precision format has a sign bit, a 5-bit exponent (bias of -15), and 10-bits of mantissa with the same implied 1. in front.

Convert 0 10001 1100000000 to decimal.

A. 1.75
B. 3.50
C. 3.75
D. 7.0
E. None of the above

Half Precision