

## HW1.7. Choose Your Own Number Representation

For this question, all numbers will be represented in **8 bits**.

For each part below, you will be given a choice between unsigned, sign-magnitude, two's complement, biased notation with +128 bias, and biased notation with -128 bias. Select all number representations that would be appropriate for the given criteria or select none of the above.

Q1.1: You would like to represent the outdoor temperature in Chicago to the nearest degrees Celsius. (*If you're not sure about the temperature ranges in Chicago, feel free to search online*) bce

- (a) unsigned
- (b) sign-magnitude
- (c) two's complement
- (d) biased notation w/ bias +128
- (e) biased notation w/ bias -128
- (f) None of the above

Select all possible options that apply. ?

Q1.2: You would like to represent the outdoor temperature in Chicago to the nearest Kelvin.

Hint:  $^{\circ}\text{K} \approx ^{\circ}\text{C} + 273$  d

- (a) unsigned
- (b) sign-magnitude
- (c) two's complement
- (d) biased notation w/ bias +128
- (e) biased notation w/ bias -128
- (f) None of the above

Select all possible options that apply. ?

Q1.3: You would like to maximize the range (distance between least representable number, and greatest representable number) acde

- (a) unsigned
- (b) sign-magnitude
- (c) two's complement
- (d) biased notation w/ bias +128
- (e) biased notation w/ bias -128
- (f) None of the above

Select all possible options that apply. ?

Q1.4: You have a system that can already do arithmetic operations (addition, subtraction, multiplication) with unsigned numbers, and want to implement a signed number system that requires the fewest changes to your system. ?

- (a) sign-magnitude
- (b) two's complement
- (c) biased notation w/ bias +128
- (d) biased notation w/ bias -128
- (e) None of the above

Select all possible options that apply. ?

## Homework 1

Assessment overview

Total points: 100/100

Score: 100%

### Question

Value: 8

History: 8

Awarded points: 8/8

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### Attached files

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Additional attempts available with new variants ?

