CS2100 **Tutorial 1**

Prannaya Gupta

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1 Discussion Questions

1. In 2's complement representation, "sign extension" is used when we want to represent an n-bit signed integer as an m-bit signed integer, where $m > n$. We do this by copying the sign-bit of the n-bit signed m–n times to the left of the n-bit number to create an m-bit number. So for example, we want to sign-extend `0b0110` to an 8-bit number. Here $n = 4$, $m = 8$, and thus we copy the sign but m–$n = 4$ times, giving us `0b00000110`. Similarly if we want to sign-extend `0b1010` to an 8-bit number, we would get `0b11111010`. Show that IN GENERAL sign extension is value-preserving. For example, `0b00000110 = 0b0110` and `0b11111010 = 0b1010`.

2 Practice Questions

1.