

# CS 350 Activities for Lecture 4

## Activity 4.1: ASCII Characters

### A. Why?

- We need to represent textual characters in addition to numbers.

### B. Outcomes

At the end of this activity you should:

- Know how textual characters are represented.

### C. Questions

1. Let '0', '1', ..., '9' be the ASCII representations of the digits 0 – 9. Which of the following statements are true: (a) '2' + '3' = '5' (b) '2' + 3 = '5' (c) 2+'3' = '5' (d) 2+3 = '5'.
2. Let  $n$  be an integer  $\geq 0$  and  $\leq 9$ . (a) What character does '0'+ $n$  represent (if any)? (b) Repeat, for '0'+'n'. (c) Repeat, for 'A'+ $n$ . (d) Repeat, for 'a'+ $n$ .
3. Let  $x$  represent one of the capital letters A–Z. (a) What is  $x$ -'A'? (b) What is  $x$ -'A'+'a'?

## Activity 4.2: Non-Whole and Floating-Point Numbers

### A. Why?

- We use floating-point numbers to represent non-whole numbers (numbers not evenly divisible by 1).

### B. Outcomes

At the end of this activity you should:

- Be able to represent floating-point numbers in binary and using the IEEE representation.

### C. Questions

4. What decimal number does  $10.011_2$  represent?
5. What is the binary representation of  $6.4375_{10}$ ? What is its scientific notation representation? (I.e.,  $1.\textit{something} \times 2^{\textit{some power}}$ .)
6. What are the scientific notation and IEEE 32-bit representations for  $10.011_2$  ?