Assignment 2: Computer Arithmetic, Fall 2020

Due: 10pm, Tuesday, Oct 13, 2020

Requirements:

- Organize your assignment solution into one single file in Microsoft Word format or PDF. Note that image format (incl. jpg etc) is not acceptable, however, you may convert jpg files to one single pdf file and then submit it.
- Submission must be conducted on-line through Blackboard website.

1. (20 marks) Given two decimal numbers $\pm 272.64_{10}$. Find the representations for the two numbers with the negative decimal system.
2. (20 marks) Find the representations for two numbers $\pm 7.5_{10}$ with the negative binary system.
3. (20 marks) Find the representations for the two numbers $\pm 30.625_{10}$ with the binary signed-digit number system. At least one positive integer digit, one positive fraction digit, one negative integer digit, and one negative fraction digit must appear in the representation.
4. (20 marks) Given binary signed-digit (BSD) number system with $r = 2, k = 5, m = 0$, and digit set $\{-1, 0, 1\}$. Find all the representations for decimal value 18_{10} with this signed-digit number system.
5. (20 marks) Perform binary SD carry-free addition for $A+B$, and $C+D$, by first using Table 2.1, and if it is not working, then use Table 2.2, where

$$A = 10101_2, B = 10011_2, D = 10\bar{1}01_2 \text{ and } E = 11010_2.$$