CMSC 313 HW1
Due 2/12/2024 11:59pm

Please submit the completed homework through Blackboard.
All numbers in this homework are in decimal number system unless otherwise indicated.

1. (20) Convert the following numbers to binary and hexadecimal. Show the calculations.
(a) 100
(b) 1000

2. (20) Find the negative (2's complement) of the following numbers. Show that taking the 2s complement of the negative value yields back the original number. Show all work. Remember to start with enough bits before performing the 2's complement operation (sign bit of positive number should be 0).
(a) 41
(b) 131

3. (20) Add the following numbers in binary. Check if the result matches expected value.
(a) 41 + 18
(b) 36 + 29

4. (20) Perform the following subtraction using 2's complement. Confirm if the result matches expected value.
(a) 36 - 29
(b) 29 - 36

5. (5) Explain why the following operation in 2's complement format is not correct.
$0111_2 + 0111_2 = 1110_2$

6. (15) Convert the following value into IEEE 32-bit floating point format, as reviewed in class:
-5.3125