1. Perform the following number conversions:
   (a) 0xABC0F1 to binary
   (b) Binary 110000011001111 to hexadecimal
   (c) Binary 110000011001111 to octal (base 8)

2. Convert between decimal and hexadecimal:
   (a) 147 to hexadecimal
   (b) 0xAE to decimal

3. Solve directly in hexadecimal: 0xB75D + 0x8AF

4. Perform the following operations on x = 0xA5 and y = 0x2C (answer in hex):
   (a) x & y
   (b) x && y
   (c) ~x & !(y | (x ^ y))

5. Perform the following shift operations on the byte x = 0xB9 (answer in hex):
   (a) x << 3
   (b) x >> 1, logical
   (c) x >> 3, arithmetic

6. Write out and sum the non-zero powers of two for the two functions shown. Express output in decimal:
   (a) B2U5(0x2E)
   (b) B2T5(0x2E)
7. Apply the function $T2U_5$ to the two following decimal values. Express the answer as a
decimal number.

(a) -7  
(b) 12 

8. Assuming an 8-bit machine that uses 2's complement arithmetic, apply the appropriate
casting and express the result as a relational value (true or false):

(a) $-127 == 127U$ 
(b) $-127 - 1U == 127$ 
(c) $-1U < 128U$ 
(d) $255U == -128$ 

9. Express $x*K$ using on only the specified number of operations:

(a) $K = 7$, using 1 shift and 1 Add/Sub 
(b) $K = -13$, using the fewest shifts and Add/Subs 

10. Write C expressions that evaluate to 1 when the following conditions are true and to 0
when they are false. Assume $x$ is of type int.

(a) Any bit of $x$ equals 1. 
(b) Any bit of $x$ equals 0. 
(c) Any bit in the least significant byte of $x$ equals 1. 

11. Convert between binary and decimal representations:

(a) 11.475 to binary 
(b) Binary 110000011001111 to hexadecimal 
(c) Binary 101.1111 to decimal 

12. (2 points) What value is represented by the following bit string when interpreted as a
single precision floating point value: 0xC0D00000? 

13. (2 points) Given the following bit string, what decimal value does it represent when
interpreted as a single precision floating point number: 0x00700000?