

COMP2270 Lab 2

Due September 16 at beginning of lab

Determine the answers on a separate sheet of paper. Show your work and please, please include your name. You can use a calculator for its arithmetic functions (addition, subtraction, multiplication), but don't do the entire conversions on a computer.

1. Let A and B be two 2-bit binary numbers (i.e., $A_1 A_0$ and $B_1 B_0$). Write out a truth table for $A \leq B$. For example, 0b10 is less than or equal to 0b11, so the output for that row should be true.
2. Write out the equivalent logic expression for the previous answer.
3. Express the majority circuit (true when the majority of inputs A, B, C are true) as an equivalent function table by omitting the C input column.
4. Write out the truth table for the minority circuit (it's true when the minority of A, B, and C are true).
5. Write out the equivalent logic expression for the previous answer.
6. Draw a Venn diagram of the truth table in (4). Label the parts clearly.
7. What is $0b111100 + 0b11111$? Show all place values, and in binary show carries and the sum. (You may check work by doing binary to decimal conversion)
8. What is $0b1011011 + 0b1110100$? Show all place values, and in binary show carries and the sum. (You may check work by doing binary to decimal conversion)
9. What is $0b101110101 - 0b101101$? Show all place values, and in binary show carries and the difference. (You may check work by doing binary to decimal conversion)
10. What is $0b110100 - 0b10111000$? Show all place values, and in binary show carries and the difference. (You may check work by doing binary to decimal conversion)