

COMPSCI 210 Assignment 1

Due date: 21:00 12th August 2011

Total marks: 100

The objective of this assignment is to gain good understanding of various forms of number representations.

- A template of the answer sheet is provided.
- You **MUST** write your answers using a word processor, e.g. MS word. Convert your answers into a PDF file and submit the PDF file through assignment drop box.
- Question 11 is worth 10 marks while each of the other questions is worth 5 marks.

1. Convert the following unsigned decimal number to an 8-bit unsigned binary number.

121_{10}

2. Convert the following 8-bit unsigned binary number to an unsigned decimal number.

11111001_2

3. What is the range of a 4-bit unsigned binary number?

4. Convert the following decimal number to an 8-bit signed magnitude binary number.

-21_{10}

5. Convert the following 8-bit signed magnitude binary number to a decimal number.

10001110_2

6. Convert the following decimal number to an 8-bit one's complement binary number.

15_{10}

7. Convert the following 8-bit one's complement binary number to a decimal number.

11110101_2

8. Convert the following decimal number to an 8-bit two's complement binary number.

-12_{10}

9. Convert the following 8-bit two's complement binary number to a decimal number.

11111101_2

10. Assume the following numbers are two's complement binary numbers. Sign extend the following numbers to make them into 8-bit two's complement binary numbers.

0111_2 1010_2

11. Assume the following numbers are 8-bit two's complement binary numbers. Calculate the result of each of the expressions. If there is an overflow during the operation, you need to indicate the overflow.

$10000001 + 00010001$

$10000000 - 00000001$

12. What is the result of the bit-wise AND operation of 00111100 and 01010101 ?

13. What is the result of the bit-wise OR operation of 00011100 and 01010101 ?

14. What is the result of $00001101 \ll 3$?

15. What is the result of $10100000 \gg 3$?

16. What is the hexadecimal representation of 1111011100011000_2 ?

17. Convert $0x1AE6$ to a binary number.

18. What is the octal representation of 111101110001100_2 ?

19. Convert 123_8 to a binary number.

Submission

1. Convert your answer to a PDF file.
2. Name your file as A1.pdf.
3. Submit A1.pdf using the assignment drop box.
4. **NO** email submission will be accepted.