

COMPSCI 210 Assignment 1

Due date: 21:00 7th August 2015

Total marks: 30

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. Name your file as "A1.pdf". NO email submission will be accepted.
- You only need to give the answer to each question. You do NOT need to show their working.
- Question 6 and 7 are worth 4 marks each while each of the other questions is worth 2 marks.

1. Convert the following unsigned decimal number to an 8-bit unsigned binary number.
 123_{10}
2. Convert the following 8-bit unsigned binary number to an unsigned decimal number.
 11111011_2
3. What is the range of a 5-bit unsigned binary number?
4. Convert the following decimal number to an 8-bit two's complement binary number.
 -14_{10}
5. Convert the following 8-bit two's complement binary number to a decimal number.
 11111101_2
6. 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.
 0101_2 1110_2
7. 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.
 $10000001 + 00010011$
 $10000000 - 00000001$
8. What is the result of the bit-wise AND operation of 00111100 and 01010101?

9. What is the result of the bit-wise OR operation of 00011100 and 01010101?
10. What is the result of $00001101 \ll 4$?
11. What is the result of $10100000 \gg 2$?
12. What is the hexadecimal representation of 1111011100011001_2 ?
13. Convert 0x1AF6 to a binary number.