Homework Assignment 1

Deadline: Sat. May. 13th, 23:59

- Please upload your submissions as zip or pdf files to Jira
- Scans or photos of paper-based solutions are also acceptable

1. Make the following base conversions. Show your work but also make use of shortcuts when applicable.

    (a) 101100101_2 to decimal
    (b) 101110101111010_2 to hexadecimal (base 16)
    (c) 101110101111010_2 to octal (base 8)
    (d) 593_{10} to binary
    (e) 6527_{10} to octal
    (f) 18107_{10} to hexadecimal
    (g) 365_8 to binary
    (h) 5022_8 to decimal
    (i) 467_8 to hexadecimal
    (j) $D7A_{16}$ to binary
    (k) $E49F_{16}$ to decimal
    (l) $3G2_{17}$ to 13-base notation

2. What is the two's complement representation of 68 with respect to 8, 16, 32 and 64 bits?

3. Convert -11 to binary using 8-bit, 16-bit, 32-bit and 64-bit two's complement notations. Have you encountered any of the values during the previous problems, and if so, where? Explain the reason why values can coincide.

4. Describe a model that can fully represent and store the state of the board for a game of tic tac toe in a computer. How many bytes of memory would your model require? Is your model as efficient as it possibly can be?

5. Is it possible to play console or mobile games on a PC? How?