Homework Assignment 1

Deadline: Tue. Jul. 12nd, 23:59

- Please upload your submissions as zip or pdf files to Jira
- Alternatively, you may send your submission by email to hovak601@gmail.com in case you encounter difficulties.
- Scans or photos of paper-based solutions are acceptable

1. Make the following base conversions. Use 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 in 8-bit, 16-bit, 32-bit and 64-bit notations?

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 the values 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 optimal?

5. Take the ASCII values of the first three letters of your surname and use them as hex values in order to produce a 24-bit web color. What is your color like?

6. Is it possible to play console games (such as those made for PlayStation) on a PC? How?