
Instructions: For the following questions, *show all of your work*. It is not sufficient to provide the answers.

Exercise 1. Convert each of the following numbers to 8-bit signed magnitude, 8-bit one's complement and 8-bit two's complement. Report your answers in binary.

- a. $(-119)_{10}$
- b. $(-53)_{10}$
- c. $(-98)_{10}$
- d. 126_{10}

Exercise 2. Convert the following 16-bit two's complement numbers in hexadecimal representation to decimal.

- a. $A42C_{16}$
- b. $62A4_{16}$
- c. $571D_{16}$
- d. $FFE3_{16}$

Exercise 3. Find the decimal equivalents for the following 8-bit two's complement numbers.

- a. 0101 0101
- b. 1100 0011
- c. 1010 1001
- d. 0010 0100

Exercise 4. Perform two's complement addition on the following pairs of numbers. In each case, indicate whether an overflow has occurred.

- a. $1001\ 1111 + 1111\ 1110$
- b. $0111\ 1010 + 0110\ 0110$
- c. $1000\ 0010 + 1000\ 0010$
- d. $1010\ 1001 + 0110\ 1100$

Project 0. Download the `hello.asm` assembly language program to your GL account. Using a text editor, replace the output string in the program with your favorite quote from a movie or TV show. Use the Unix `script` command to record yourself assembling and running the program. (Do not include any editing!) Then, submit both the source code and the sample run:

```
submit cs313 proj0 hello.asm typescript
```