Computer Science 240
Binary Operations
Assignment for Lab 2

Submit hardcopy of completed exercises at the beginning of lab. Also, submit a hardcopy of your answers from lecture Assignment Zero for the "Make Nothing from Something" section (solutions to some simple bit puzzles).

For each of the following problems, perform addition on the given values (assume **two's complement** representation). Indicate whether there is a carry-out or an overflow for each addition.

For the first 2 calculations, assume **16- bit representation.** Do the calculation using the binary values.

Then, convert the result to hexadecimal notation. To convert, divide the 16 binary digits of the result into groups of 4, and translate each group to the corresponding hexadecimal value. Note that if there is a carry-out, that is the 17th bit, and it is not used in result or in the hexadecimal translation!

	Carry-Out?	Overflow?

1.
$$1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1_2$$
$$+\quad 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1_2$$

Result in binary :

Result in hexadecimal:

	Carry-Out?	Overflow?

2.
$$0\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0_2$$
$$+\quad 0\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 0\ 0\ 1\ 1\ 0\ 0\ 1_2$$

Result in binary :

Result in hexadecimal:

Now, assume 32-bit representation, using hexadecimal notation, and specify result in hexadecimal.

	Carry-Out?	Overflow?

3.
$$A\ A\ F\ F\ 9\ 0\ 1\ 4_{16}$$
$$+\quad A\ A\ E\ 3\ C\ D\ 1\ 2_{16}$$

Result in hexadecimal:

	Carry-Out?	Overflow?

4.
$$7\ F\ A\ A\ 3\ 2\ 7\ 8_{16}$$
$$+\quad 6\ 0\ 2\ 4\ C\ D\ 1\ 2_{16}$$

Result in hexadecimal: