**Operations:**

1's complement: toggle the bits

2's complement: (toggle the bits and add 1) == (1's complement and move CW by 1)

2's complement twice: back to original bits

**Notations:**

N bits

unsigned: 0 to \(2^N-1\)

2's complement or signed: \(-(2^{N-1})\) to \(2^{N-1}-1\)

**Try the following:**

1. Draw bit patterns (0 at top, proceeding clockwise) and connect 1's complements

2. Label the 2's complement values (0 at top, + to right, - to left, maximum magnitude - at bottom)

3. 3 + -5 with 4 bits

4. -5 + -5 with 4 bits (does this work?)