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SIE370 HW2-P42-Written

2/13/23

6. Signed Binary Addition Methods

a) 6_{10} and -5_{10}

1) Sign and Magnitude:

$$\begin{array}{r} 6 \quad 0110 \\ + (-5) \quad + 1101 \\ \hline 1 \quad 1001 \end{array}$$

2) Ones' Complement:

$$\begin{array}{r} 6 \quad 0110 \\ + (-5) \quad + 1010 \\ \hline 1 \quad 1000 \end{array} = \boxed{0001}$$

3) Two's Complement:

$$\begin{array}{r} 6 \quad 0110 \\ + (-5) \quad + 1011 \\ \hline 1 \quad 10001 \end{array} = \boxed{0001}$$

b) -6_{10} and 5_{10}

1) Sign and Magnitude:

$$\begin{array}{r} -6 \quad 1110 \\ + 5 \quad 0101 \\ \hline -1 \quad 1001 \end{array} = \boxed{1001}$$

2) Ones' Complement:

$$\begin{array}{r} -6 \quad 1001 \\ + 5 \quad 0101 \\ \hline -1 \quad 1110 \end{array} = \boxed{1110}$$

Two's Complement:

$$\begin{array}{r} -6 \quad 1010 \\ + 5 \quad 0101 \\ \hline -1 \quad 1111 \end{array} = \boxed{1111}$$