WEEK 1 TASK 2

- Calculate 10-19 , 20+30 , 36-12 in signed, 1s and 2s complement.

- Using 1s complement
  - 10 – 19

    $(10)_{10} = (01010)_2 = 0\ 01010_2$

    $(-19)_{10} = -(10011)_2 = 1\ 01100_2$

    0 01010

    +1 01100

    1 10110 no carry, take 1s complement of the result

    1 01001 <- result
  - 20 + 30

    $(20)_{10} = (10100)_2 = 0\ 10100_2$

    $(30)_{10} = (11110)_2 = 0\ 11110_2$

    0 10100

    +0 11110

    0 1 10010

    0 110010 <- result
  - 36 - 12

    $(36)_{10} = (100100)_2 = 0\ 100100_2$

    $(-12)_{10} = -(001100)_2 = 1\ 110011_2$

    0 100100

    +1 110011

    1 0 010111 add carry to lower bit

    0 011000 <- result
- Using 2s complement
  - 10 – 19

    $(10)_{10} = (01010)_2 = 0\ 01010_2$

    $(-19)_{10} = -(10011)_2 = 1\ 01101_2$

    0 01010

    +1 01101

    1 10111 no carry, take 2s complement of the result

    1 01001 <- result
  - 20 + 30

    $(20)_{10} = (10100)_2 = 0\ 10100_2$

    $(30)_{10} = (11110)_2 = 0\ 11110_2$

    0 10100

    +0 11110

    0 1 10010

    0 110010 <- result

- 36 - 12

  $(36)_{10} = (100100)_2 = 0\ 100100_2$

  $(-12)_{10} = -(001100)_2 = 1\ 110100_2$

  0 100100

  +1 110100

  1 0 011000 discard carry

  0 011000 <- result

- Using signed
  - 10 – 19

    $(10)_{10} = (01010)_2 = 0\ 01010_2$

    $(-19)_{10} = -(10011)_2 = 1\ 10011_2$

    0 01010

    +1 10011

    1 11101

  - 20 + 30

    $(20)_{10} = (10100)_2 = 0\ 10100_2$

    $(30)_{10} = (11110)_2 = 0\ 11110_2$

    0 10100

    +0 11110

    0 1 10010

  - 36 - 12

    $(36)_{10} = (100100)_2 = 0\ 100100_2$

    $(-12)_{10} = -(001100)_2 = 1\ 001100_2$

    0 100100

    +1 001100

    1 110000