1. Converting Binary Numbers to Hexadecimal Numbers
   1. 0110 0001 1111🡪 6 1 F 🡪
   2. 1000 1111 1100 🡪 8 F C 🡪
   3. 0001 0110 0100 0101 🡪 1 6 4 5 🡪
2. Converting Binary to Decimal
   1. 1100 1010
      1. 1100 1010 🡪 -(2 + 8 + 64) 🡪 -74
      2. 1100 1010 🡪 1011 0101 🡪 -(1 + 4 + 16 + 32) 🡪 -53
      3. 1100 1010 🡪 1100 1001 🡪 1011 0110 🡪 -(2 + 4 + 16 + 32) 🡪 -54
   2. 1111 0010
      1. 1111 0010 🡪 -(2 + 16 + 32 + 64) 🡪 -114
      2. 1111 0010 🡪 1000 1101 🡪 -(1 + 4 + 8) 🡪 -13
      3. 1111 0010 🡪 1111 0001 🡪 1000 1110 🡪 -(2 + 4 + 8) 🡪 -14
   3. 1000 0111
      1. 1000 0111 🡪 -(1 + 2 + 4) 🡪 -7
      2. 1000 0111 🡪 1111 1000 🡪 -(8 + 16 + 32 + 64) 🡪 -120
      3. 1000 0111 🡪 1000 0110 🡪 1111 1001 🡪 -(1 + 8 + 16 + 32 + 64) 🡪 -121
3. Converting Decimal to Binary
   * 1. 1110 0100 (wrote positive 100 in binary and made the first bit a 1)
     2. 1001 1011 (keep first bit from “a” the same and toggle the rest)
     3. 1001 1100 (add 1 from b)
     4. 1001 0000 (wrote positive 16 in binary and made the first bit a one)
     5. 1110 1111 (keep first bit from “a” the same and toggle the rest)
     6. 1111 0000 (add 1 from b)
     7. 1001 0101 (wrote positive 21 in binary and made the first bit a 1)
     8. 1110 1010 (keep first bit from “a” the same and toggle the rest)
     9. 1110 1011 (add 1 from b)
     10. 1000 0000 (wrote positive 0 in binary and made the first bit a 1)
     11. 1111 1111 (keep first bit from “a” the same and toggle the rest)
     12. 0000 0000 (add 1 from b/ overloads to 9 bit (1 0000 0000))
4. What is the range of:
   1. For an unsigned 7-bit number, the binary range is 111 1111 – 011 1111. This in decimal form equates to the range of -63 – 63.
   2. For a signed 7-bit number, the binary range is 000 0000 – 111 1111. This in decimal form equates to the range of 0 – 127.
5. Provide the answer to the following problems:
   1. 1000 (only first bit is true)
   2. 1110 (first three bits or true since OR)
   3. (1000) V (1000) 🡪 1000 (first bit is true because of OR)
6. Demonstrate each step in the calculation
   1. Signed Magnitude: 0001 1001(+25 in S.M.) + 1100 0001(-65 in S.M.) 🡪 1101 1011(S.M.) 🡪
   2. One’s: 0001 1001(+25 in 1’s) + 1011 1110(-65 in 1’s) 🡪 1101 0111(1’s) 🡪 1010 1000(S.M.) 🡪
   3. Two’s: 0001 1001(+25 in 2’s) + 1011 1111(-65 in 2’s) 🡪 1101 1001(2’s) 🡪 1101 1000(1’s) 🡪 1010 0111(S.M.) 🡪
7. Converting and checking for answer:
   1. 🡪 1010 1000(S.M.) 🡪 1101 0111(1’s) 🡪 1101 1000(2’s)
   2. The calculation of 25 – 65 using One’s complement proved to be the correct calculation based on the conversion of to signed magnitude, one’s complement, and two’s complement.