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Homework Set 2

1. 1. Unsigned 6-Bit: Smallest = 0 (**000000**)2 and Largest = 63 (**111111**)2
   2. Two’s Complement 6-Bit: Smallest = -32 (**100000**)2 and Largest = 31 (**011111**)2
   3. Signed/Magnitude 6-Bit: Smallest = -31 (**111111**)2 and Largest = 31 (**011111**)2
2. You would need **23** bits to represent YYYYMMDD
3. (0101 0011)2 = **(-107)10** Two’s Complement = **(-21)10** Sign/Magnitude
   1. (35)10 = (**0010** **0011**)2 Two’s Complement
   2. (-93)10 = (**1010** **0011**)2 Two’s Complement
   3. (120)10 = (**1111** **0000**)2 Two’s Complement
   4. (01101)2 = (0000 1101)2 = (**13**)10
   5. (11110)2 = (1111 1110)2 = (**-2**)10
   6. (10101)2 = (1111 0101)2 = (**-11**)10
   7. 6 + 31 = (000110)2 + (011111)2 = (**100101**)2 = (-27)10
   8. (-23) + 11 = (101001)2 + (001011)2 = (**110100**)2 = (-12)10
   9. (-17) + (-13) = (101111)2 + (110011)2 = (**100010**)2 = (-30)10
   10. -29 – 5 = (100011)2 + (111011)2 = (**011110**)2 = (30)10
4. (1001 1011)2
   1. >> 1 = **(1000 1101)2**
   2. << 1 = **(0011 0110)2**
   3. >>> 1 = **(0100 1101)2**
5. (0011 0101)2
   1. >> 2 = **(0000 1101)2**
   2. << 2 = **(1101 0100)2**
   3. >>> 2 = **(0000 1101)2**
6. Write the following decimal numbers in 16-Bit Fixed-Point Sign/Magnitude, 16-Bit Fixed-Point Two’s Complement, and IEEE 754 Floating Point Format.
   1. -37.0625
      1. Sign/Magnitude = (**A510**)16
      2. Two’s Complement = (**DAF0**)16
      3. IEEE 754 = (**C2144000**)16
   2. 23.375
      1. Sign/Magnitude = **(1760)16**
      2. Two’s Complement = **(1760)16**
      3. IEEE 754 = **(41BB0000)16**
   3. 0xC0D20004 + 0x72407020 = **0x72407020**
   4. 0x5EF10324 + 0x5E039020 = **0x5EF9E926**