1 SOLUTIONS Information Representation EXERCISES

7. (a) Signed magnitud:
   - 83 $\Rightarrow 01010011_2$
   - -83 $\Rightarrow 11010011_2$

   (b) one's complement:
   - 83 $\Rightarrow 01010011_2$
   - -83 $\Rightarrow 10101100_2$

   (c) two's complement:
   - 83 $\Rightarrow 01010011_2$
   - -83 $\Rightarrow 10101101_2$

8.
   - binari code $10001011_2 \Rightarrow 139$
   - Signed magnitud: $10001011_2 \Rightarrow$ -11
   - one's complement: $10001011_2 \Rightarrow$ -116
   - two's complement: $10001011_2 \Rightarrow$ -117

9.
   - binary code: 0 to 255
   - signed and magnitud: The maximum number which is possible to represent is 01111111_2 $\Rightarrow$ 127 and the minimum number is 11111111_2 (-127) so range is -127 to 127
   - one's complement: The maximum number which is possible to represent is 01111111_2 $\Rightarrow$ 127 and the minimum number is $10000000_2 \Rightarrow 01111111_2$ (-127) so -127 to 127
   - two's complement: The maximum number which is possible to represent is 01111111_2 $\Rightarrow$ 127 and the minimum number is $10000000_2 \Rightarrow 01111111_2 + 110000000_2$ (-128) so -128 to 127

10. $10101100_2 = 1 * 2^3 + 1 * 2^1 + 1 * 2^{-1} + 1 * 2^{-2} = 10.75$