

Exercise 1.

1. Count from 0 to 20 in binary code.
2. Count from 0 to 15 in Gray code.

Exercise 2.

1. Convert to Straight Binary, the following numbers written in Gray code.

100011_{Gray} ; 1101111_{Gray} ; ; 11111111_{Gray} .

2. Convert to Gray code, the following numbers written in Straight Binary code.

110011_2 ; 1011000_2 ; 10011101_2 .

Exercise 3.

1. How many bits would be required to encode decimal numbers from 0 to 9999 in Straight binary and BCD codes ?
2. Give the BCD equivalent of 37 in 16-bit representation.

Exercise 4.

1. Write the BCD equivalent codes of.

27; 379; 1425; 9.25; 46.86.

2. Convert to decimal the following numbers written in BCD code.

10000111 ; 100100110110 ; 10011.001 ; 1000.0111001 .

Exercise 5. 1. Write the Excess-3 equivalent codes of

81; 349; 17.25; 236.146.

2. Convert to decimal the following numbers written in Excess-3 code.

1001_{XS-3} ; 1100100001110011_{XS-3} ; 1100.110_{XS-3} ; 1001.10001011_{XS-3} .

Exercise 6. 1. Using ASCII encoding table to encode your name in hexadecimal.

2. Using ASCII encoding table to decrypt the following ASCII data.

47 6F 20 64 6F 77 6E 20 64 65 65 70 20 65 6E
6F 75 67 68 20 69 6E 74 6F 20 61 6E 79 74 68
69 6E 67 20 61 6E 64 20 79 6F 75 20 77 69 6C
6C 20 66 69 6E 64 20 6D 61 74 68 65 6D 61 74
69 63 73 2E

Exercise 7. Encode the following quote in binary. "Mathematics compares the most diverse phenomena and discovers the secret analogies that unite them."

Exercise 8. Give the number of characters in the following UTF-8 code.

F5 B2 A3 91 2C C1 9D 30.

Exercise 9. 1. Encode in UTF-8 the Hebrew character א (Aleph) of Unicode code. U + 2135, follow this instructions.

- Convert 2135 to binary.
- Determine the number of significant bits.
- Choose a design.
- Give the binary code.
- Covert this code to hexadecimal.

2. Determine the Unicode code of the UTF-8 encoded character in hexadecimal C2A3.