

# Review Exercise: Encoding

---

Use **capital** (not lower-case) letters for hexadecimal digits above nine. Show all work.

1. **Complete** the Hexadecimal column in the table on the right.
2. **Convert** the following bits into hexadecimal:

11001111 10100111 00100011

Binary	Hexadecimal
0000	
0001	
0010	
0011	
0100	
0101	
0110	
0111	
1000	
1001	
1010	
1011	
1100	
1101	
1110	
1111	

- a. **Convert**  $194_{10}$  to binary. Convert back to decimal to check your answer.
  - b. **Convert** your answer from the previous part to hexadecimal.
3.
    - a. **Find** the number of values a 6-bit binary number can hold.
    - b. **Find** the maximum value of a 6-bit binary number.
  4. **Approximate** how many values a 40-bit number can hold.

5. **Approximate** how many bits are needed to store numbers ranging from 1 through  $10^{15}$ .

6. Consider this message in hexadecimal shorthand:

0c 37 a2 4c fb f5 5b 6e ad 72 42 ce b4 e6 25 4f a0 d9 76 d0 07 9f 8d ...

a. **Circle** the first two bytes in the message above

b. **Write** the value of these bytes in **binary**.

c. **Write** the value of these bytes in **decimal**.

7. **Convert** the following message from ASCII codes to ASCII characters

44 41 44 0D 0A 42 45 41 44 0D 0A

8. **Write** the hexadecimal shorthand for how the bytes object is stored in Python

b'Ebb\r\n'