Bits, bytes and encoding

1. How many bits are in one byte? (8)
2. In how many different ways can one bit be organised? (256)
3. What’s the highest number a single byte can present? (255)
4. What is nibble? (half a byte)
5. Convert the following numbers from Decimal to Hexadecimals:

|  |  |  |  |
| --- | --- | --- | --- |
| 00 (00) |  | 15 (of/f) |  |
| 01 (01) |  | 16 (10) |  |
| 09 (09) |  | 17 (11) |  |
| 10 (0a/a) |  | 30 (1d) |  |
| 11 (0b/b) |  | 255 (ff) |  |

1. Convert the following numbers from Hexadecimals to Decimals

|  |  |  |  |
| --- | --- | --- | --- |
| 00 (00) |  | 25 (37) |  |
| 01 (01) |  | 0a (10) |  |
| 09 (09) |  | 0f (15) |  |
| 10 (16) |  | 1a (26) |  |
| 15 (21) |  | A1 (161) |  |
| 16 (22) |  | Ac (172) |  |

1. Convert the phrase “hello world” to hexadecimals (using ascii table) (68656c6c6f20776f726c64)
2. Write the result for each of the following commands:

|  |  |  |  |
| --- | --- | --- | --- |
| (23).to\_bytes(10, byteorder='big') |  | bytes.fromhex("aa") |  |
| (23).to\_bytes(5, byteorder=’little’) |  | "aa".encode("utf-8") |  |

1. What’s the highest datatype we can use in JavaScrip (natively, without any external liberties). What affect might it have on our ability to work with Bitcoin using JavaScript? What ways we might have around it?