**Binary Encoding**

*See the lesson notes / video at*: [dmaccarthy.github.io/sci/#cs\_new/ct1/bin](https://dmaccarthy.github.io/sci/#cs_new/ct1/bin)

1. Explain how computer memory encodes and stores information.

Answer

2. Define a *bit* and a *byte*.

Answer

3. What is the largest decimal number that you could encode using 12 bits? Explain.

Answer

4. How many bits would be needed to encode the decimal number 1000000 as binary? Explain.

Answer

5. Convert each of these binary (base two) numbers into decimal (base ten). Show your work as in the example below.

|  |  |  |
| --- | --- | --- |
| **Binary** | **Show Work…** | **Decimal** |
| **0b01110011** | **64 + 32 + 16 + 2 + 1** | **115** |
| 0b01001001 |  |  |
| 0b10001000 |  |  |
| 0b01010101 |  |  |
| 0b11110111 |  |  |
| 0b1010101 00101010 |  |  |
| 0b00010111 10000001 |  |  |

6. Convert each of these decimal numbers into binary. Show your work as in the example.

|  |  |  |
| --- | --- | --- |
| **Decimal** | **Show Work…** | **Binary** |
| **120** | **64 + 32 + 16 + 8** | **0b1111000** |
| 35 |  |  |
| 81 |  |  |
| 249 |  |  |
| 167 |  |  |
| 3000 |  |  |
| 62143 |  |  |