Number Bases

| Decimal | Binary | Hex |
| :--- | :--- | :--- |
| 0 |  |  |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 12 |  |  |
| 13 |  |  |
| 14 |  |  |
| 15 |  |  |

## IEC Prefixes

| Name | Abbr | Factor |
| :--- | :--- | :--- |
| Kibi | Ki | $2^{10}=1,024$ |
| mebi | Mi | $2^{20}=1,048,576$ |
| gibi | Gi | $2^{30}=1,073,741,824$ |
| tebi | Ti | $2^{40}=1,099,511,627,776$ |
| pebi | Pi | $2^{50}=1,125,899,906,842,624$ |
| exbi | Ei | $2^{60}=1,152,921,504,606,846,976$ |
| Zebi | Zi | $2^{70}=1,180,591,620,717,411,303,424$ |
| yobi | Yi | $2^{80}=1,208,925,819,614,629,174,706,176$ |

## Exercises

1) Fill in the following table:

| Decimal | Binary | Hex |
| :--- | :--- | :--- |
| 31 |  |  |
|  | $0 b 00011011$ |  |
|  |  | $0 x 11$ |
|  |  | 0 x 7 f |
|  | 0 b 11001010 |  |
| 255 |  |  |

2) The Koozbanian language has 768 distinct symbols. What is the minimum number of bits needed to represent every symbol?
3) Represent the following values in IEC format:
$2^{18}$
$2^{3}$
$2^{43}$
$2^{20}$
4) Your awesome new computer has 1.5 TiB of byte-addressed memory (1.5 Ti possible addresses). How many bits are needed to represent every address?
