

“There are 10 types of people in this world: those who start salivating upon seeing the first part of this sentence, and those who don’t understand binary.”

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		
	0b0001 1011	
		0x11
		0x7f
	0b1100 1010	
255		

2) The Koozbanian language has 768 distinct symbols. What is the minimum number of bits needed to represent every symbol? Is there any waste?

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 (1.5Ti possible addresses). How many bits are needed to represent every address?

Bonus question:

Say that you have a scale that compares the weight of objects placed on its two sides.

Now suppose that you have 8 pomelos, and all but one of them is the same weight, the one is lighter than the rest. What's the minimum number of weightings it takes to determine which the lighter one is? What if you had 9 pomelos? 10?

Mnemonics from the days of your forefathers-

1. Kim's melodious giddiness terrifies people, excepting zealous yodelers
2. Kirby Messed Gigglypuff Terribly, (then) Perfectly Exterminated Zelda and Yoshi
3. Killed meat gives teeth peace except zebra yogurt
4. Kind Men Give Tense People Extra Zeal (for) Yoga
5. Killing melee gives terror; peace exhibits Zen yoga
6. Killing messengers gives terrible people exactly zero, yo
7. Kindergarten means giving teachers perfect examples (of) zeal (&) youth
8. Kissing mediocre girls/guys teaches people (to) expect zero (from) you
9. Kinky Mean Girls Teach P*nis-Extending Zen Yoga
10. Kissing Mel Gibson, Teddy Pendergrass exclaimed: "Zesty, yo!"