

Re: More of an Algorithms question

>>>>> There are 2^{n-1} files with fewer than n bits. Hence, the claim
>>>>> stands.

>>>>

>>>> Not by my count.

>>>>

>>>> For example, 16 possible files with 4 bits but only 8 possible

>>>> files with 3 bits, no?

>>>>

>>>> Are there any other files with fewer than 4 bits that you have

>>>> overlooked in your count?

>>>>

>>>> Ok, I see my confusion.

>>>>

>>>> I failed to take into account files with less than $(n-1)$ bits.

>>>>

>>>> I get it now — thanks.

>>>>

>>>> quasi

>>>>

>>>> Ok, but then along the lines of what I was thinking, the following

>>>> claim is valid:

>>>>

>>>> In any lossless compression scheme, less than half of the files with n

>>>> or fewer bits can be compressed.

>>>>

>>>> quasi

Isn't "less than half" even stronger as "none"? A 1-bit file cannot be compressed, since the only smaller file (0 bits) is needed to represent itself. Then a 2-bit file cannot be compressed, since all of the 0- and 1-bit files are needed to represent themselves. Induction.

By the way, the "except for 1" applies only with binary representation. In general base b , there are $(b^n - 1)/(b - 1)$ number with fewer than n base b digits, not only losing the "-1" in $(b^n - 1)$ but also dividing by $(b - 1)$. In base 10, only 1 of the 1-digit numbers can be compressed, leaving 9 orphans (or, pigeons without unoccupied pigeon holes).

Lynn Killingbeck

.

- **Follow-Ups:**

- ◆ **Re: More of an Algorithms question**

- ◇ From: quasi

- **References:**

- ◆ **More of an Algorithms question**

- ◇ From: Filter

- ◆ **Re: More of an Algorithms question**

Re: More of an Algorithms question

◇ *From:* Richard Harter

◆ ***Re: More of an Algorithms question***

◇ *From:* quasi

◆ ***Re: More of an Algorithms question***

◇ *From:* Dave Seaman

◆ ***Re: More of an Algorithms question***

◇ *From:* quasi

◆ ***Re: More of an Algorithms question***

◇ *From:* Dave Seaman

◆ ***Re: More of an Algorithms question***

◇ *From:* quasi

◆ ***Re: More of an Algorithms question***

◇ *From:* quasi

- Prev by Date: ***Re: Spherical Wrapping***
- Next by Date: ***Re: Variance of a Quadratic Function***
- Previous by thread: ***Re: More of an Algorithms question***
- Next by thread: ***Re: More of an Algorithms question***
- Index(es):
 - ◆ ***Date***
 - ◆ ***Thread***