

Re: Binary number digits <- > Decimal number digits

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- *From:* "mensanator@xxxxxxxxxxxx" <mensanator@xxxxxxx>
 - *Date:* Sun, 9 Dec 2007 20:37:26 -0800 (PST)
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On Dec 9, 4:21 pm, Adam <n...@xxxxxxxx> wrote:

On Sun, 09 Dec 2007 16:44:00 -0500, Adam wrote:

On Sun, 9 Dec 2007 07:39:24 -0800 (PST), fc wrote:

And: how to generalize for any decimal number of any length?

Consider the following two 5-digit decimal numbers:

expression decimal number bits required
 $2^{16} - 1$ 65,535 16
 $2^{16} + 2^{14}$ 81,920 17

$$5 * \log(10) / \log(2) = 16.6$$

Round up or down comes into play again.

It's even messier than that:

expression decimal number bits required

none 10,000 14
 2^{14} 16,384 15
 2^{15} 32,768 16
 $2^{16} + 2^{14}$ 81,920 17

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Not messy at all:

```
x = 99999
gmpy.numdigits(x,2)
```

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Adam

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