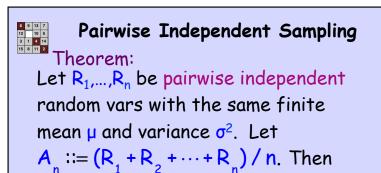


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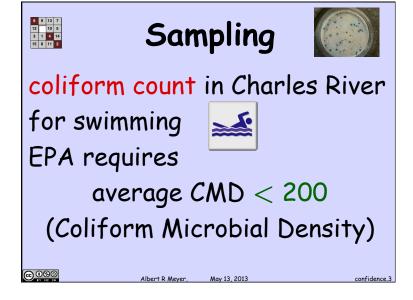


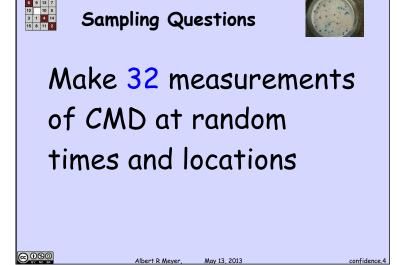
$$\Pr[|A_{n} - \mu| > \delta] \leq \frac{1}{n} \left(\frac{\sigma}{\delta}\right)^{2}$$

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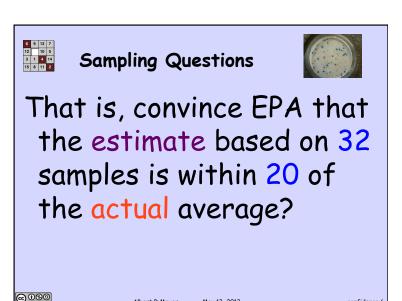
May 13 2013

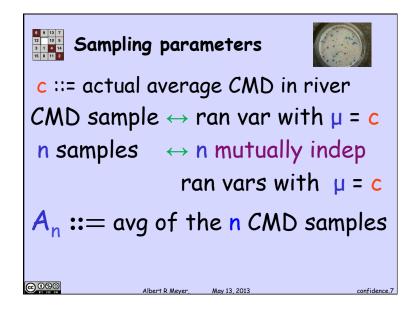


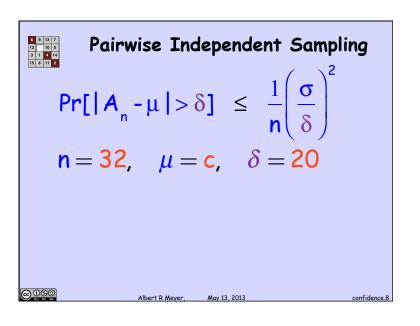


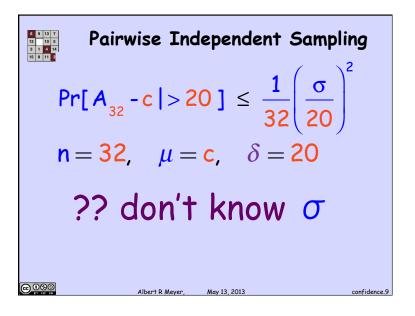
A few of the 32 counts turn out to be > 200 but their average is 180.

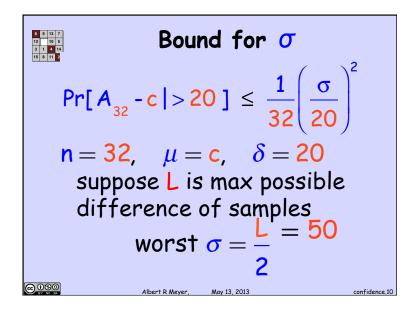
Convince the EPA that avg in whole river is < 200?

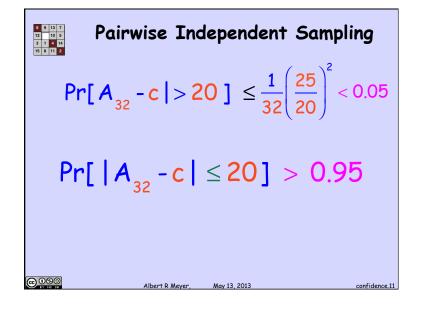


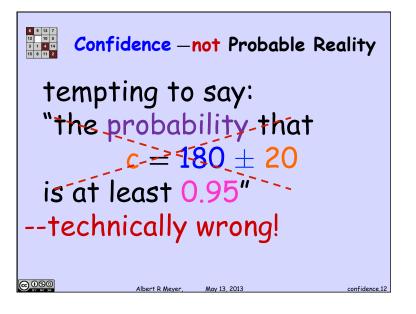














Confidence

- c is the actual average in the river.
- c is unknown, but not a random variable!



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Confidence

The possible outcomes of our sampling process is a random variable. We can say that the "probability that our sampling process will yield an average that is \pm 20 of the true average at least 0.95"



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Confidence

Tell the EPA that with probability 0.95 our estimate method for avg CMD will be within 20 of the actual avg, c, in the river.



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Confidence

For simplicity we say that

c = 180 ± 20 at the 95% confidence level

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Confidence

Moral: when you are told that some fact holds at a high confidence level, remember that a random experiment lies behind this claim. Ask yourself "what experiment?"



Moral: Also ask "Why am I hearing about this particular experiment? How many others were tried and not reported?"

See http://xkcd.com/882/

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