

Re: Variance estimation by Permutation Samples

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****A. G. McDowell said:

Here's a test example for resampling-based methods. Consider n i.i.d. samples which are 0 with probability p and 1 with probability $1-p$. The variance of each sample is therefore $p(1-p)$. With probability $2^{-(n-1)}$ all the samples you see will be the same. Consider a method for constructing confidence intervals that is supposed to fail to provide an interval containing the true value with probability less than $2^{-(n-1)}$. Feed it n identical values. Does the resulting interval contain the true variance?

Thank you very much for your mail.

My post is a *scratch*, a previous idea that must be improved. Evidently, the only feature that matters is the true variance must be contained in the CI.

I had to change my primitive algorithm as I show below.

It can be seen that I perform 3 different tests of the single Hypothesis:

Test 1.-The conventional ruled by the Chi-squared distribution.

And the resampling

Test 2.- A new one using the MM (modified mean) and MM2 (modified second ordinary moment).

Test 3. Bootstrap

Because I use as source-sample simulated normal samples $X = N(100, 20)$, I can always check if the Tests 2 and 3, hit or miss the goal: the true variance contained in the CI. Test 1 needs not: a Theorem guarantees that the level of significance is equal to the probability to miss.

Results will arrive soon.

Happy New Year to Everyone

licas (Luis A. Afonso)

```
REM "rubi"  
CLS  
DIM q(40, 2), has(9002)  
INPUT " size (20 or 40) "; size  
q(20, 1) = 8.907: q(20, 2) = 32.85  
q(40, 1) = 23.654: q(40, 2) = 58.12  
cc = size * (size + 1) / 2  
DIM x(size), xx(size), z(size)  
pi = 4 * ATN(1)  
RANDOMIZE TIMER  
sum = 0: sq = 0
```

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```
FOR i = 1 TO size
a = SQR(-2 * LOG(RND)): r = RND
x(i) = 100 + 20 * a * COS(2 * pi * r)
xx(i) = x(i)
sum = sum + x(i)
sq = sq + x(i) * x(i)
NEXT i
sqd = sq - sum * sum / size
vvar = sqd / (size - 1)
PRINT USING " var= #####.# "; vvar
a = sqd / q(size, 1): b = sqd / q(size, 2)
PRINT " Parametric Test : ";
PRINT USING "#####.## "; b; a
PRINT : PRINT "***** ": PRINT
REM "MM"
ALL = 40000
FOR v = 1 TO ALL
LOCATE 8, 50
PRINT USING "
```