

Bootstrapping

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1 Introduction

Many of us has research on how to perform the test in presence of random effects(Mixed effect models).But we at last get that this test is almost impossible because now many correlation term are playing there role.So many of us have come out of some test but the problem is, they made some assumption that is not realistic in real world and another case is that if they use some ad-hoc or similar things then this can be done for some absolutely simple cases.So till now what we come to and most convincing to many of us is the likelihood ratio test however don't rely on any perfect model for this rather than do parametric bootstrapping for mixed effect models.The test is basically to check how we can ensure that out likelihood ratio is extreme on the null cases and to except in case of extreme result.

2 Technique /Process:

2.1 First Step:

Fit the NULL model and the FULL model on the data we have get.So we have to take the ML function of Null hypothesis and get the estimator the MLE then fit the estimator in the ML function.Same do as for FULL hypothesis.

2.2 Second Step:

Now we have to take the ratio of null ML value and full model ML value.

2.3 Third Step:

we have to make a number of loop with this two step

2.3.1 1st step:

Is to generate data from the null model not the re-sampling.Since we generate data from fitted model it is called bootstrap.Since it is modelled not mere re-sampling that's why it called the parametric bootstrap.

2.3.2 2nd step:

Now again from the generated data we run first step and second step get the LR. This is the second data. Run this loop multiple times.

2.4 Fourth step:

Now compute the p value as the proportion of generated LR. We take how many generated ratio are more extreme than the original LR.

3 Conclusion:

If the p value is low then we reject the null hypothesis but if our observe value is high then we accept the NULL hypothesis.

4 Example:

We get a data Run the 1st and 2nd step and get the marking LR. Run 3rd step approx 10,000 times get the p value if it is less than say 5% then reject NULL and if greater than then accept NULL hypothesis.