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Obtaining LOO *p* in Analysis Involving Three or More Class Categories

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For class variables with two categories, ODA and MegaODA software employ Fisher's one-tailed exact test to assess *p* associated with LOO classification performance. For class variables having three or more categories, LOO *p* is not provided. This article discusses how to use ODA and MegaODA software to obtain LOO *p* in this situation.

Analysis using a four-category class variable produced the LOO confusion matrix presented in Table 1.

Table 1: LOO Confusion Matrix for Class Variable Having Four Categories

Actual	Predicted Category			
Category	1	2	3	4
1	8	1	6	3
2	2	6	7	3
3	1	5	8	4
4	0	6	3	9

ODA[1] and MegaODA[2-4] software print ESS (here, 24.07), but not associated one-tailed Type I error rate for this result, since there are more than two class categories.

One-tailed *p* for this LOO result may be obtained using the TABLE routine in ODA and MegaODA software. The code needed to obtain the confirmatory LOO *p* presently is:

```
OPEN DATA;
OUTPUT AnyName.Out;
CATEGORICAL ON;
TABLE 4;
CLASS ROW;
DIRECTIONAL < 1 2 3 4;
MCARLO ITER 25000;
DATA;
8 1 6 3
2 6 7 3
1 5 8 4
0 6 3 9
END DATA;
GO;
```

Running this program yields ESS=24.07, $p<0.00056$.

References

[1]Yarnold PR, Soltysik RC (2005). *Optimal data analysis: Guidebook with software for Windows*. Washington, D.C.: APA Books.

[2]Soltysik RC, Yarnold PR (2013). MegaODA large sample and BIG DATA time trials: Separating the chaff. *Optimal Data Analysis, 2*, 194-197.

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[3]Soltysik RC, Yarnold PR (2013). MegaODA large sample and BIG DATA time trials: Harvesting the Wheat. *Optimal Data Analysis, 2*, 202-205.

[4]Yarnold PR, Soltysik RC (2013). MegaODA large sample and BIG DATA time trials: Maximum velocity analysis. *Optimal Data Analysis, 2,* 220-221.

Author Notes

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