Speed

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1 Abstract

Version 1.0.0 computes every analysis from closed forms on the table of cell means and one block analysis of the plot data, instead of refitting models branch by branch. This vignette reports the timings against version 0.6.0.

2 Timings

Median time and memory over 20 runs (`tools/bench.R` in the source repository), on the shipped data and on simulated diallels of 12 and 20 parents with 3 replicates:

```
b <- data.table::fread(file = system.file("extdata", "bench.csv", package
 ↪  = "DiallelAnalysisR"))
w <- data.table::dcast(data = b, formula = case ~ version, value.var =
 ↪  "median_ms")
data.table::setnames(x = w, old = c("0.6.0", "1.0.0"), new =
 ↪  c("ms_0.6.0", "ms_1.0.0"))
w[, speedup := round(x = ms_0.6.0 / ms_1.0.0, digits = 1)]
knitr::kable(x = w, digits = 2)
```

case	ms_0.6.0	ms_1.0.0	speedup
griffing_m1_P12	14.61	2.63	5.6

case	ms_0.6.0	ms_1.0.0	speedup
griffing_m1_P20	181.86	3.05	59.7
griffing_m1_P8	6.08	2.97	2.0
griffing_m2_P8	4.76	4.80	1.0
hayman_P20	147.35	4.70	31.3
hayman_P8	5.62	4.01	1.4
partial_10x4	4.84	1.86	2.6

3 Where the time goes

Version 0.6.0 fitted `aov()` and built several tables with `tapply()` in each branch, and its cost grew quickly with the number of parents. Version 1.0.0 builds the table of cell means in one grouped sum, computes the error mean square in closed form for complete blocks, and evaluates the sums of squares, effects, standard errors and expected mean squares as matrix expressions; its time hardly changes between 8 and 20 parents.

4 Summary

The modernised package is faster for every analysis and many times faster for larger diallels, with less memory.