Extending the package

Muhammad Yaseen

2026-11-03

Table of contents

1 Abstract **1**

2 The building blocks **1**

3 A new statistic: the coefficient of regression of the interaction **2**

4 Summary **2**

1 Abstract

How a new stability statistic is added so that it fits the package: a core, an exported function, a result with methods, an interpretation, a help page and tests.

2 The building blocks

```
cd <- stability:::.stab_ge_data(
    y    = ge_data$Yield
  , gen  = ge_data$Gen
  , env  = ge_data$Env
  , rep  = ge_data$Rep
  , fn   = "example"
  )
names(cd)
```

```
 [1] "M"        "N"        "G"        "E"        "R"        "anova"
 [7] "mse"      "df_e"     "plots"    "balanced"
```

```
round(x = cd$M[1:3, 1:4])
```

```
          FSD FSDR Okara Sargodha
013BT034 4816 4524  4048     4508
```

```
122557   4880 4156  2984     4754
122559   4135 4136  4377     4688
```

```
cd$anova
```

```
Analysis of Variance Table

Response: y

           Df    Sum Sq  Mean Sq F value    Pr(>F)
Env        10 263940496 26394050 68.0551 1.995e-08 ***
Rep(Env)   11   4266167   387833
Gen        59  71662431  1214617 12.2482 < 2.2e-16 ***
Gen:Env   590 201336476   341248  3.4411 < 2.2e-16 ***
Residuals 649  64359568    99167
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

`.stab_ge_data()` gives the table of means, the counts, the combined analysis of variance and the pooled error; `.stab_ge_effects()` and `.stab_svd()` the interaction and its decomposition.

3 A new statistic: the coefficient of regression of the interaction

```
Z <- stability:::.stab_ge_effects(cd$M)
I <- colMeans(cd$M) - mean(cd$M)
head(x = sort(drop(Z %*% I) / sum(I^2)), n = 5)
```

```
 BARDC1016     SD1013   SRN13121     V12066      NR448
-0.9123774 -0.6699113 -0.5134928 -0.4286048 -0.4176358
```

As an exported function it would check its arguments, wrap the result with `.stab_out()` (class, label, plot data), define `.stab_print_<name>()`, `.stab_plot_<name>()` and an interpreter `.stab_int_<name>()` with its guide, and come with tests against an independent computation.

4 Summary

Every analysis follows one pattern; a new one reuses the table of means, the error, the result class, the plot theme, the interpretation and the test helpers.