Package 'gregRy'

October 13, 2022

Type Package

Title GREGORY Estimation

Version 0.1.0

Description Functions which make using the Generalized Regression Estimator(GREG)
J.N.K. Rao, Isabel Molina, (2015) <doi:10.3390/f11020244>
and the Generalized Regression Estimator Operating on Resolutions of Y (GREGORY) easier.
The functions are designed to work well within a forestry context, and estimate multiple
estimation units at once. Compared to other survey estimation packages, this function has greater flexibility when
describing the linear model.

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Encoding UTF-8

Imports dplyr, purrr, tidyr, magrittr

RoxygenNote 7.1.1

Suggests knitr, rmarkdown

NeedsCompilation no

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R topics documented:

gregory_all *gregory_all*

Description

This function runs the Generalized Regression Operating on Resolutions of Y estimator, also know as GREGORY, on a set of data.

Usage

```
gregory_all(
  plot_df,
  resolution,
  estimation,
  pixel_estimation_means,
  proportions,
  formula,
  prop
)
```

Arguments

plot_df	A data frame containing the response variable, predictors, estimation unit, and resolution unit for each "plot"
resolution	A character specifying the resolution column name within the other dataframes
estimation	A character specifying the estimation column name within the other dataframes
pixel_estimation_means	A dataframe with a column for the estimation unit and a column for the mean response variable value per that estimation unit
proportions	A dataframe with three columns: one for resolution, one for estimation, and one for the proportion of a resolution area found in each estimation area
formula	Formula to be used for the model, names should be consistent with the column names in plot_df and pixel_estimation_means
prop	A character specifying the column name of the proportion found in proportions

Value

A dataframe with each row representing each estimation unit, its estimate, and its estimated variance.

Examples

```
#create plot data
planet_plot_data <- data.frame(plot_number = 1:20,
                               planet = c(rep("Kashyyyk", 5),
                                          rep("Forest Moon of Endor", 5),
```

```
                                          rep("Dagobah", 5),
                                          rep("Naboo", 5)),
                                count_of_trees = c(204, 156, 240, 286, 263,
                                                   112, 167, 131, 25, 145,
                                                   141, 65, 127, 15, 98,
                                                   100, 12, 49, 94, 69),
                                forest_cover = c(85, 74, 89, 95, 92,
                                                 70, 73, 69, 11, 68,
                                                 67, 30, 62, 15, 42,
                                                 59, 5, 17, 25, 22),
                           eco_province = c("forest", "swamp", "forest", "forest", "forest",
                                        "forest", "forest", "forest", "grassland", "forest",
                                          "forest", "swamp", "swamp", "grassland", "swamp",
                                                  "forest", "grassland", "grassland",
                                                  "swamp", "swamp"))

  #create mean data
  planet_means <- data.frame(planet = c("Kashyyyk",
                                        "Forest Moon of Endor",
                                        "Dagobah",
                                        "Naboo"),
                             forest_cover = c(95,
                                              85,
                                              50,
                                              30))
  #create proportion data
  planet_province_prop <- data.frame(planet = c(rep("Kashyyyk", 2),
                                                rep("Forest Moon of Endor", 2),
                                                rep("Dagobah", 3),
                                                rep("Naboo", 3)),
                                     eco_province = c("forest", "swamp",
                                                      "forest", "grassland",
                                                      "forest", "grassland", "swamp",
                                                      "forest", "grassland", "swamp"),
                                     prop = c(0.8, 0.2,
                                              0.75, 0.25,
                                              0.1, 0.1, 0.8,
                                              0.2, 0.4, 0.4))

  x1 <- gregory_all(plot_df = planet_plot_data,
                    resolution = "eco_province",
                    estimation = "planet",
                    pixel_estimation_means = planet_means,
                    proportions = planet_province_prop,
                    formula = count_of_trees ~ forest_cover,
                    prop = "prop")
  x1
```

---

greg_all *greg_all*

Description

This function runs the Generalized Regression estimator, also know as GREG, on a set of data.

Usage

```
greg_all(plot_df, estimation, pixel_estimation_means, formula)
```

Arguments

plot_df	A data frame containing the response variable, predictors, estimation unit, and resolution unit for each "plot"
estimation	A character specifying the estimation column name within the other dataframes
pixel_estimation_means	A dataframe with a column for the estimation unit and a column for the mean response variable value per that estimation unit
formula	Formula to be used for the model, names should be consistent with the column names in plot_df and pixel_estimation_means

Value

A dataframe with each row representing each estimation unit, its estimate, and its estimated variance.

Examples

```
#create plot data
planet_plot_data <- data.frame(plot_number = 1:20,
                               planet = c(rep("Kashyyyk", 5),
                                          rep("Forest Moon of Endor", 5),
                                          rep("Dagobah", 5),
                                          rep("Naboo", 5)),
                               count_of_trees = c(204, 156, 240, 286, 263,
                                                  112, 167, 131, 25, 145,
                                                  141, 65, 127, 15, 98,
                                                  100, 12, 49, 94, 69),
                               forest_cover = c(85, 74, 89, 95, 92,
                                                70, 73, 69, 11, 68,
                                                67, 30, 62, 15, 42,
                                                59, 5, 17, 25, 22))

#create mean data
planet_means <- data.frame(planet = c("Kashyyyk",
                                      "Forest Moon of Endor",
                                      "Dagobah",
                                      "Naboo"),
                           forest_cover = c(95,
                                            85,
                                            50,
                                            30))
```

```
x1 <- greg_all(plot_df = planet_plot_data,
               estimation = "planet",
               pixel_estimation_means = planet_means,
               formula = count_of_trees ~ forest_cover)
x1
```

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