Package ‘gregRy’

October 13, 2022

Type Package
Title GREGORY Estimation
Version 0.1.0
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 func-
tion has greater flexibility when describing the linear model.
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Encoding UTF-8
Imports dplyr, purrr, tidyr, magrittr
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Description

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

Usage

```r
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 data frame with a column for the estimation unit and a column for the mean response variable value per that estimation unit
- **proportions**
  - A data frame 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

```r
# 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
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,
                                            90,
                                            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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