Package 'BayesianFitForecast'

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Type Package

Title Bayesian Parameter Estimation and Forecasting for
Epidemiological Models

Version 1.0.0

Description Methods for Bayesian parameter estimation and forecasting in epidemiological models.
Functions enable model fitting using Bayesian methods and generate forecasts with uncertainty quantification.
Implements approaches described in <doi:10.48550/arXiv.2411.05371> and <doi:10.1002/sim.9164>.

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Encoding UTF-8

Imports bayesplot, readxl, openxlsx, rstan, ggplot2, dplyr

Depends R (>= 3.5.0)

URL https://github.com/gchowell/BayesianFitForecast

BugReports https://github.com/gchowell/BayesianFitForecast/issues

RoxygenNote 7.3.2

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

NeedsCompilation no

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Repository CRAN

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Contents

Index   **4**

Run_analyzeResults   *Run Analyze Results with Specified Data and Options*

Description

This function performs an analysis based on the specified data file, option_file, Excel file, and it
saves the results in the output_path. It loads auxiliary data, executes analysis steps, and saves the
results.

Usage

```
Run_analyzeResults(
  data_file_location,
  option_file,
  excel_file,
  output_path = NULL
)
```

Arguments

data_file_location
                  The location of the data file which is generated after Run_MCMC.

option_file   The name of the option file (e.g., "option1.R") located in the current working
                  directory.

excel_file   The path to an Excel file containing additional data. This parameter is required
                  and must be a valid path to an existing file.

output_path   Directory where the output will be saved. If NULL, a temporary directory will be
                  created and used.

Value

None. The function executes the analysis and saves the results to the specified output_path.

Examples

```
# Define file paths
data_file <- system.file("extdata",
                          package = "BayesianFitForecast")
option_file <- system.file("extdata", "option.R",
                          package = "BayesianFitForecast")
```

```
excel_file <- system.file("extdata", "SanFrancisco.xlsx",
                              package = "BayesianFitForecast")
# Run the analysis

Run_analyzeResults(
  data_file = data_file,
  option_file = option_file,
  excel_file = excel_file,
  output_path = NULL)


# Results are saved in the specified directory or temporary directory if none is provided.
```

Run_MCMC   *Run MCMC Analysis with Specified Option File*

Description

This function runs an MCMC analysis based on the specified option file, sourcing auxiliary scripts, and executing the analysis.

Usage

```
Run_MCMC(option_file, excel_file = NULL, output_path = NULL)
```

Arguments

option_file   The name of the option file (e.g., "option1.R") located in the current working directory.

excel_file   The path to the Excel file containing the data.

output_path   Directory where the output will be saved. If NULL, uses a temporary directory.

Value

None. The function executes and saves results directly.

Examples

```
# Get path to the example option file included with package
option_file <- system.file("extdata", "option.R",
                              package = "BayesianFitForecast")

# Specify the path to the Excel file you want to analyze
excel_file <- system.file("extdata", "SanFrancisco.xlsx",
                              package = "BayesianFitForecast")  # Modify this path accordingly

# Run the MCMC analysis

Run_MCMC(option_file = option_file, excel_file = excel_file, output_path = NULL)
```

Index