Code Structure

Overview

This project conducts time series analysis on the occurrence of Haemorrhagic Fever with Renal Syndrome (HFRS) using ARIMA (AutoRegressive Integrated Moving Average) modeling. The analysis aims to understand the temporal patterns and forecast future incidence of HFRS.

Getting Started

To run the analysis, ensure you have the following dependencies installed:

- pandas

- numpy

- matplotlib

- statsmodels

Code Structure

- Import Libraries: Imports necessary libraries for data manipulation, visualization, and time series analysis.

- Load Time Series Data: Reads the time series data from a CSV file and preprocesses it.

- Check for Stationarity: Performs the Augmented Dickey-Fuller test to check for stationarity in the time series data.

- Plot Time Series Data: Visualizes the original time series data showing the HFRS incidence over time.

- Decompose Time Series: Decomposes the time series into trend, seasonality, and residuals using seasonal decomposition.

- Plot Autocorrelation and Partial Autocorrelation: Plots the autocorrelation and partial autocorrelation plots to identify the order of the ARIMA model.

- Fit ARIMA Model: Fits an ARIMA model to the time series data with the specified order (p, d, q).

- Print Model Summary: Prints the summary of the ARIMA model including coefficient estimates, standard errors, and statistical tests.

- Plot Model Diagnostics: Visualizes diagnostic plots of the ARIMA model including residual autocorrelation, histogram, and Q-Q plot.

-Forecast Future Values: Forecasts future values of the time series using the fitted ARIMA model.

- Plot Forecasted Values: Visualizes the actual time series data along with the forecasted values for comparison.

Results

The analysis provides insights into the temporal patterns of HFRS incidence and forecasts future values based on the ARIMA model. Model diagnostics and evaluation metrics help assess the goodness-of-fit of the model.

Conclusion

Time series analysis is a valuable tool for understanding and predicting the occurrence of HFRS. Further enhancements and adjustments to the model can be made based on specific requirements and additional analysis objectives.