Time Series in Python

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Introduction

Time series prediction is using Time series data, to predict future values using time series modeling.

- AI
  - Temporal Fusion Transformer
  - ARIMA
  - ANOVA
  - StatModel
  - Sample Entropy
- Non AI
  - Regression
  - Augmented Dickey-Fuller test
  - Granger Causality Test

Stat Model:
A Stationary time series has statistical properties or moments that do not change over time. The series statistical properties, such as mean, variance, and auto correlation remains constant over time.

Temporal Fusion Transformer:
This is an attention-based deep neural network that has been optimized for performance and interpretability. In order to learn temporal dependencies, the TFT employs recurrent layers for local processing and interpretable self-attention layers.

ANOVA:
A test that is used to determine whether survey or experiment result are significant. That means they assist in determining whether to reject the null hypothesis or accept the alternative hypothesis.

Sample Entropy:
Approximate Entropy is a technique for quantifying the amount of regularity and unpredictability in time-series data. This is very much similar to sample entropy however sample entropy is more consistent in estimating the complexity even for smaller time series
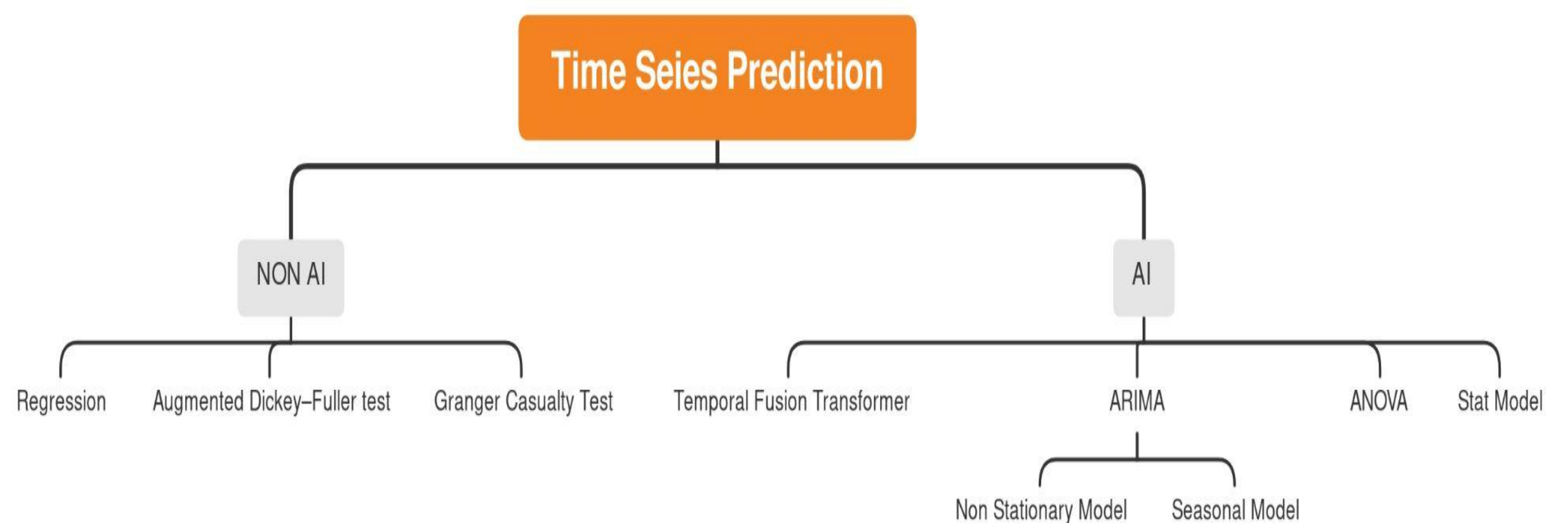

Figure #1: a diagram representing the different formats of time series.

Granger Causality Test:
The Granger Causality test is used to determine whether one time series can be used to predict another. It is a statistical concept of causality that is based on prediction.

ARIMA:
Arima is a forecasting Algorithm that stands for "AutoRegressive Integrated Moving Average" It is a class of statistical models for analyzing and forecasting time series Data.

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