



Time Series Assignment

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Problem Statement:

1. Time-series datasets are highly popular and provide a wide range of countless applications such as stock market investigation, financial and sales forecasting, and budget analysis, to name a few.
2. They are also beneficial for studying natural phenomena like atmospheric pressure, temperature, wind speeds, earthquakes, and medical predictions for treatment. An observed time series can be categorized into three main components: the trend i.e the long cycle, the seasonal systematic or calendar associated movements, and the irregular unsystematic or short-term instabilities.

Data Description

This data set includes 5 years of Temperature Data for a Specific City having 1826 records .

Feature Name	Description
MIN Temp	Minimum Temperature Recorded for the Day in celsius
Max Temp	Maximum Temperature Recorded for the Day in celsius
Avg Temp	Average Temperature Recorded for the Day in celsius
Sunrise	Time in the morning when the sun appears
Sunset	Time in the evening when the daylight faded

1. How many Days Average temperature exceeds 50 celsius?
 - a. 175
 - b. 331
 - c. 278
 - d. 420
2. Which year will be termed as the hottest year?

- a. 2017
 - b. 2018
 - c. 2016
 - d. 2014
3. How you will be handling missing values in this dataset:
- a. Fill up the null values with the median.
 - b. Fill up the null values with standard deviation.
 - c. Fill up the null values with the mean.
 - d. Fill up the null values with None.
4. Which columns are not having any kind of relationship with the MaxTemp column?
- a. Sunset
 - b. MinTemp
 - c. Sunrise
 - d. Both A And C
5. Which of the following Order is the best order for ARIMA Model on top of the Above Dataset for the target variable - AvgTemp
- a. ARIMA(1,0,5)
 - b. ARIMA(0,0,5)
 - c. ARIMA(2,0,5)
 - d. ARIMA(3,0,2)
6. What is the ADF(Augmented Dickey Fuller Test) used for detecting?
- a. Normality
 - b. Seasonality
 - c. Stationary
 - d. Independence
7. Which of the Statements is True ?
- a. $p > 0.05$, Data is stationary
 - b. $p < 0.05$ Data is stationary
 - c. $p < 0.5$ Data is Not Stationary
 - d. $p > 0.5$ Data is stationary
8. Determine the Average Error in Prediction By the Model?
- a. 1-3%
 - b. 3-6%
 - c. 6-8%
 - d. 8-11%

9. What is the Coefficient of AR of the above model for the target variable Avg Temp?
- 0.90 to 1.0
 - 0.50 to 0.60
 - 0.60 to 0.70
 - 0.30 to 0.40
10. Which conditions need to be satisfied to refer to the time series as stationary.
- Autocovariance function depends on s and t only through their difference $|s-t|$ (where t and s are moments in time)
 - The time series under considerations is a finite variance process
 - Mean is constant and does not depend on time
 - None of the above
11. IF we have observed the time series Y_1, Y_2, \dots, Y_t and the forecast error $e_t(l) = Y_{t+l} - bY_t(l)$ has mean zero, the MMSE forecast $bY_t(l)$ can be referred as:
- Unbiased.
 - Complementary.
 - Consistent.
 - Stationary.
12. Which of the following is a seasonality Detection Technique for Time Series Data?
1. Autocorrelation
 2. Multiple box
- Only 2
 - Only 1
 - None of the above
 - Both 1 and 2
13. If the moving average component (q) in an ARIMA model = 1, Hence there will be the auto-correlation in the series with lag = 1.
- True
 - False
14. What is the expectation of the dependent variable for a Moving Average Model?
- Variable
 - Constant

- c. All of the Above
 - d. None of the Above
15. Which of the following statements is True?
- 1.If there is no decay in the ACF values for any number of lags time series is Stationary
 - 2. The rate of decay will determine the value of the coefficient terms.
 - 3.In a Time Series coefficient for the residual error terms can be negative
- a. 1 only
 - b. 1 and 3 only
 - c. 2and 3 only
 - d. All of the Above