1. Select the correct statement. When comparing a stationary and a non-stationary Time Series:
   1. A **stationary** series has the same mean and variance over time, making a non-**stationary** series harder to model.
2. Which of the following statements about time series analysis is TRUE?
   1. A non-stationary time series can be transformedand modeled as a stationary timeseries
3. This time series component is related to the long term direction of the series:
   1. Trend
4. This time series component is related to the periodic behavior of the time series:
   1. Seasonality
5. This time series component is related to the irregular fluctuations of the time series:
   1. Residual

## End of module quiz: Introduction to Time Series Analysis

1. This time series component is related to the long term direction of the series:
   1. Trend
2. This is the type of decomposition model that is used if the magnitudes of the seasonal and residual values fluctuate with trend:
   1. Multiplicative Decomposition Model
3. This decomposition model assumes that the seasonal and residual magnitudes are independent of trend.
   1. Additive Decomposition Model
4. These are all Time Series decomposition techniques, except:
   1. Ordinary Least Square models
5. Which of the following smoothing techniques is appropriate for data with a trend but no seasonality?
   1. Double Exponential Smoothing
6. Which of the following smoothing techniques is appropriate for data with both trend and seasonality?
   1. Triple Exponential Smoothing
7. (True/False) Smoothing techniques require scaled data to be effective.
   1. False

## End of module quiz: Stationarity and Time Series Smoothing

1. (True/False) An important component of time series modeling involves plotting and visual inspection of the data.
   1. True
2. (True/False) If forecast residuals approximate white noise, the model is likely a bad fit and a different model should be selected.
   1. False
3. This smoothing model assumes that the seasonal and residual magnitudes are independent of trend.
   1. Additive Smoothing Model
4. These are all Time Series smoothing techniques, except:
   1. Ordinary Least Square models
5. (True/False) A common limitation of forecasts based on smoothed data is their high sensitivity to outliers and unusual historical values.
   1. False
6. (True/False) ARMA models combine two models.
   1. True ARMA models combine an autoregressive (AR) model and a moving average (MA) model.
7. This term can be used interchangeably with the term ARMA model:
   1. Box-Jenkins approach
8. These are all facts about ARMA models, except:
   1. A good rule of thumb is to have at least 1000 observations to fit.
9. (True/False) SARIMA models are an extension of ARIMA models that addresses seasonality.
   1. True
10. These are all characteristics of ARIMA models, except:
    1. They are not prone to overfit.
11. These are all assumptions of the ARMA, ARIMA, and SARIMA models, except:
    1. Past data does not predict future data.

## End of module quiz: ARMA and ARIMA Models

1. Which of the following is a characteristic of an autoregressive (AR) model?
   1. A fixed number of past forecast values are used to predict future values.
2. Which of the following is a characteristic of a moving average (MA) model?
   1. A fixed number of past forecast errors are used to predict future values.
3. An ARIMA model without differencing (I=0) is equivalent to which of the following approaches?
   1. The sum of an autoregressive (AR) and moving average (MA)model.
4. These are all ways to detect seasonality, except:
   1. Stationarity tests
5. This plot summarizes the 2-way correlation between a variable and its past values:
   1. Autocorrelation plot
6. These are all advantages of Deep Learning approaches to Time Series forecasting, except:
   1. Tend to perform best with large training datasets.
7. This Deep Learning approach is well suited for long input sequences as is often the case in Time series in which sequences are often hundreds of steps:
   1. Long-Short Term Memory
8. (True/False) Comparing LSTMs vs RNNs, LSTMs tend to take longer to train (slower backpropagation) and can be more prone to overfitting.
   1. True
9. These are all best practices to select a Deep Learning approach for a Forecasting task, EXCEPT:
   1. A common approach is to use an ensemble of both and LSTM and an RNN to improve the forecast.
10. (True/False) In the use case of predicting customer churn, you can use Survival Analysis to calculate the expected time until churn.
    1. False
11. (True/False) You can use the Keplen Meier curve to create a Survival Analysis model
    1. False; Keplen Meier curves across different groups are used as a form of Exploratory Data Analysis, not yet any Survival Analysis model.
12. This Survival Analysis model assumes that the proportional impact on the hazard rate doesn’t change over time:
    1. Cox proportional hazards regression