# Predictive Analytics Exam

# Methodology

## Data

### Data Source

The data used in this study has been supplied by STUTE in an attempt to better understand their customer demand cycles and thereby predict future order intake in order to improve capacity planning and logistics.

### Dataset Description

The dataset used in this study consisted of a large xlsx file containing information about all position requests made by Airbus to STUTE during the period 2015-01-01 and 2019-05-21. The target variable is the sum of all position requested per day and the frequency is daily.

## Models

### ARIMA

ARIMA is an acronym and stands for Auto Regressive Integrated Moving Average. It is a stochastic time series model that can be trained and used in order to forecast future time points. Due to its structure, the ARIMA model can capture complex relationships through the consideration of error terms, observed lagged terms, and regressing a variable on past values.

-Lags of the stationarized series are autoregressive and are referred to in the AR terms

-Forecast errors are called moving average and are referred to in the MA terms

-Requires stationarity which means that all the statistical properties like mean, variance, autocorrelation are constant in time

-ARIMA(p,d,q):

p – the number of autoregressive terms: Incorporate the effect of past values into model.

D – the number of nonseasonal differences: Likelihood of similarity based on the variance of

Previous observations

Q – the number of moving-average terms: estimate error of model using linear combination of historical errors.

### Innovation state space model (ETS)