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Airline Demand Forecasting

For our forecasting model, we chose a multiplicative model to predict demand based on the day of the week of departure and the number of days until departure. We subset our data to only include days to depart less than 28 days because we are only interested in when bookings ramp up. We then created new calculated columns for the training set, including the number of days until departure, the day of the week of departure, and a daily “multiplier” calculated from the cum\_bookings of the current day and the cum\_bookings of the next day. We then removed any of the “multiplier” values that are zero as we are concerned then with the next departure date. The “multipliers” are averaged for every combination of day of the week AND days to depart. A separate model is created for each day of the week and then we calculate “cumulative multipliers.” After preparing the validation set for the model, we use our model to determine which day of departure and number of days to depart, assign a “cumulative multiplier,” and multiply the cum\_bookings to get the predicted values. Our MASE value is 0.39.

We tried several other models with poor results. Our first model was a polynomial fitting, but unfortunately the model overfit and resulted in negative predictions despite a MASE of 0.61. We attempted a log-linear model but our predicted values were too extreme to move forward with validation. Our first multiplicative model resulted in a MASE of 1.12 and we did not have time to pursue an additive model.