Seas the Data - Executive Summary

I improved the ferry redemption forecast in two ways. First, I enhanced the *original model* provided by adding a more advanced time-series forecasting technique (SARIMAX) that captures seasonal patterns like busy summer weekends or winter lulls. This addressed the original model's main limitation: it was simple and didn't reflect real-world cycles. I also evaluated its accuracy using time-series cross-validation.

I spent most of my time on the second problem: creating an entirely *new forecasting model* from scratch for both redemptions and sales. This new model breaks the problem into meaningful time patterns: time of day, day of week, and time of year. It also tracks long-term trends. By combining these layers, the model produces reliable 15-minute interval forecasts throughout the year. I used a separate test set to estimate uncertainty and then added prediction intervals to the results. This makes it easy to see not only what's likely to happen, but how much variation to expect.

Both models use open-source tools and are reproducible and modular. They're easy to update and expand, making them useful for decision-makers who need to plan ferry operations with more precision and fewer surprises.