**Question 1 Answer:**

Holt-Winters Exponential Smoothing was the preferred method because it specifically focuses on capturing seasonality and trends in data. It provides reliable projections for data that exhibit regular patterns, which is why it worked well with this dataset. The model effectively smoothed out fluctuations while capturing the seasonality of the revenue, making its projections more consistent. Additionally, after evaluating the metrics, it was clear that this model was a strong candidate and had been tuned sufficiently without the risk of overfitting. Furthermore, given that Holt-Winters performs better with additive and multiplicative data, its superior performance was not surprising.

I should add that, unlike the answer to Question Two, this response is not as technical because I made an effort to visualize the data in a more apparent manner. In contrast, the other question did not involve nearly as many outputs. Feel free to reach out to me at any time. I apologize if this seems like overkill, but I have extensive experience in this subject matter due to my current position.

**Question 2 Answer:**

From the analysis, total shipping costs increased substantially, rising from $146,145.69 in 2017 to $238,678.37 in 2018—a 63% increase—despite having a better contract. This increase occurred even though the average billed weight decreased slightly, from 4.25 lbs in 2017 to 4.02 lbs in 2018, suggesting that weight was not a major factor in the cost rise.

The zone distribution of shipments remained largely consistent between the two years, with Zones 2, 3, 4, and 5 handling the bulk of the shipments. However, there was a noticeable rise in shipments to Zone 7, increasing from 4% in 2017 to 7% in 2018, which likely contributed to higher costs due to longer shipping distances.

In addition to changes in zone distribution, surcharges and additional fees also played a role in driving up costs. Fuel surcharges almost doubled, going from $0.27 in 2017 to $0.54 in 2018. New fees were introduced in 2018, including additional handling charges and declared value surcharges, further compounding the overall increase in shipping expenses.

Overall, the surge in costs was driven by a combination of increased surcharges, additional handling fees, and a shift toward shipping to more distant zones, particularly Zone 7.

**Question 3 Answer:**

Trends observed in the mock-up history showed that the Daily Line Items had similar time series patterns year by year when compared at that level. The same observation applied to Daily Quantity Sold. Both showed peaks later in the year, especially in December. Daily Line Items increased more consistently towards the end of the year, with the average moving up, while Quantity Sold had larger spikes, with one year showing two such spikes.

There were many outliers in this data, significantly more than the 1-5% typically seen in datasets. This dataset had a contamination rate of 12.14%, which is high given the context. A lot of this contamination can be attributed to specific days and products, for example, looking at December days and products such as ['Q4690512', 'EPCR0012', 'Q4690756', 'PXE050', 'EPCR0034'].