**HUYNH DO**

**Module 8, Part 2**

1. **State the purpose of the exercise**
* **Analyze and Understand Data Trends**
* Identify key patterns in the time series data, including trends, seasonality, and fluctuations.
* **Model and Forecast the Data**
* Develop an appropriate time series to accurately fit the historical data and generate reliable forecasts for future periods.
* **Evaluate Model Fit and Accuracy**
* Evaluate the model's performance by using key metrics such as R-Squared, Stationary R-squared, MAPE, and MaxAPE to ensure it provides a good representation of the data.
* Compare predicted values with actual values and visualize confidence intervals to evaluate prediction reliability.
* **Understand Residual Behavior**:
* Examine residual patterns (via PACF, and other diagnostics) to detect any model inadequacies or autocorrelation that may affect forecasting accuracy.
1. **State how to calculate the statistical technique – For Market 2: R2**
2. **Mean of Actual Values: Total (actual values) / Number of observations = 30112.983**
3. **Total Sum of Squares (TSS):** TSS=∑(yi​−yˉ​)2 = **10,317,517,425.4**
4. **Sum of Squared Errors (SSE):** SSE=∑(yi​−y^​i​)2 = **40,511,665**
5. R2 = 1− (SSE/TSS​) = 1- (**40,511,665/10,317,517,425.4**) = **0.996**
6. **Interpret the findings**

The exercise demonstrates how well Holt's model captures linear trends, but it also emphasizes how crucial it is to include seasonal or cyclic aspects for datasets such as Markets 1 and 2. Even while the current model produces accurate short-term predictions, it will be better able to generalize and offer useful long-term insights if it is refined using a seasonal or cyclic framework.