

## 15.5 Exercises

### Basic Concepts

1. What is seasonality?
2. Give a business scenario where we would see seasonality.
3. What assumption do we make with the additive seasonal forecasting method?
4. What is a disadvantage of the additive seasonal model? Which model can overcome this?
5. What is a seasonal factor? What does it represent?
6. What are the four steps to perform a multiplicative seasonal forecast?

### Exercises

7. Use the Border Crossings data set. Calculate the monthly seasonality factor for the Laredo Truck Crossings data.
8. Use the Border Crossings data set. Calculate the monthly seasonality factor for the Detroit Truck Crossings data.
9. Use the Border Crossings data set. Compute the additive quarterly seasonal forecast model for the Detroit Truck Crossing data without trend.
10. Use the Border Crossings data set. Compute the additive quarterly seasonal forecast model for the Detroit Truck Crossing data with trend.
11. Use the Monthly Average Retail Gas Prices data set, which includes the average gas prices in the U.S. from April 1993 to July 2021. Using the data from January 1994 to December 2020, compute the monthly seasonality factor for the gas prices. Which month or months generally have the highest gas prices in the U.S.?
12. Use the Monthly Average Retail Gas Prices data set, which includes the average gas prices in the U.S. from April 1993 to July 2021. Use the data from January 2016 to December 2020 to compute the monthly forecast of gas prices for 2021 if the same trend and seasonality pattern continue.

#### Data

The data set can be found by visiting [stat.hawkeslearning.com](http://stat.hawkeslearning.com) and navigating to **Discovering Business Statistics, Second Edition > Data Sets > Border Crossings**.

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