Unit 04

Exercise 05 - Calculating Elasticity for a New Product Launch

Scenario: A tech company has launched a new tablet in the market, and the marketing team is analyzing how sensitive consumers are to price changes. The company recorded the following sales data at two different price points:

- **Initial Price:** $300
- **Initial Quantity Sold:** 12,000 units
- **New Price:** $450
- **New Quantity Sold:** 9,000 units

Using this data, calculate the price elasticity of demand for the tablet using the midpoint method.

Questions:

1. **Calculate the Percentage Change in Price:**
   - Use the midpoint method to calculate the percentage change in price when the price increased from $300 to $450.
2. **Calculate the Percentage Change in Quantity Demanded:**
   - Use the midpoint method to calculate the percentage change in quantity demanded as sales dropped from 12,000 units to 9,000 units.
3. **Calculate the Price Elasticity of Demand:**
   - Use the percentage changes calculated in the previous steps to determine the price elasticity of demand for the tablet. Based on your calculation, classify the demand as elastic, inelastic, or unit elastic.

Solution Steps:

1. **Calculate the Percentage Change in Price:**
   - Midpoint method formula:

$$\% \text{ change in price} = \frac{(P_2 - P_1)}{\left(\frac{P_1 + P_2}{2}\right)} \times 100$$

   - Substitute the values:

$$\% \text{ change in price} = \frac{(450 - 300)}{375} \times 100 = 40\%$$

2. **Calculate the Percentage Change in Quantity Demanded:**
   o Midpoint method formula:

$$\% \text{ change in quantity demanded} = \frac{(Q_2 - Q_1)}{\left(\frac{Q_1 + Q_2}{2}\right)} \times 100$$

   o Substitute the values:

$$\% \text{ change in quantity demanded} = \frac{(9000 - 12000)}{10500} \times 100 = -28.57\%$$

3. **Calculate the Price Elasticity of Demand:**
   o Elasticity formula:

$$\text{Price Elasticity of Demand} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$

   o Substitute the values:

$$\text{Price Elasticity of Demand} = \frac{-28.57\%}{40\%} = -0.71$$

Interpretation:

- **Price Elasticity of Demand:** -0.71
   o Since the absolute value of the price elasticity is less than 1, the demand for the tablet is **inelastic**. This means that the percentage change in quantity demanded is less than the percentage change in price.

Additional Challenge:

If the company wants to maximize its total revenue, should it increase or decrease the price from the current level? Justify your answer based on the elasticity calculated.

New Scenario: A tech company has launched a new tablet in the market, and the marketing team is analyzing how sensitive consumers are to price changes. The company recorded the following sales data at two different price points:

- Initial Price: $350
- Initial Quantity Sold: 11,000 units
- New Price: $300 (a decrease in price)
- New Quantity Sold: 15,000 units (a larger increase in quantity sold)

Now, let's calculate the PED using the midpoint method:

$$PED = \frac{(Q_2 - Q_1)/((Q_2 + Q_1)/2)}{(P_2 - P_1)/((P_2 + P_1)/2)}$$

Given:

- P1 = $350
- Q1 = 11,000 units
- P2 = $300
- Q2 = 15,000 units

Calculating the numerator (percentage change in quantity):

$$\frac{(15000 - 11000)}{((15000 + 11000)/2)} = \frac{4000}{13000} \approx 0.3077$$

Calculating the denominator (percentage change in price):

$$\frac{(300 - 350)}{((300 + 350)/2)} = \frac{-50}{325} \approx -0.1538$$

Finally, dividing the numerator by the denominator:

$$PED = \frac{0.3077}{-0.1538} \approx -2.00$$

In this case, the price elasticity of demand is approximately -2.00, which indicates that demand is elastic. This means the quantity demanded is highly responsive to price changes. Note that the negative sign indicates the inverse relationship between price and quantity demanded, which is typical in demand curves.