


# Key Insights from Bike Sales Data Analysis

Junilyre Villar



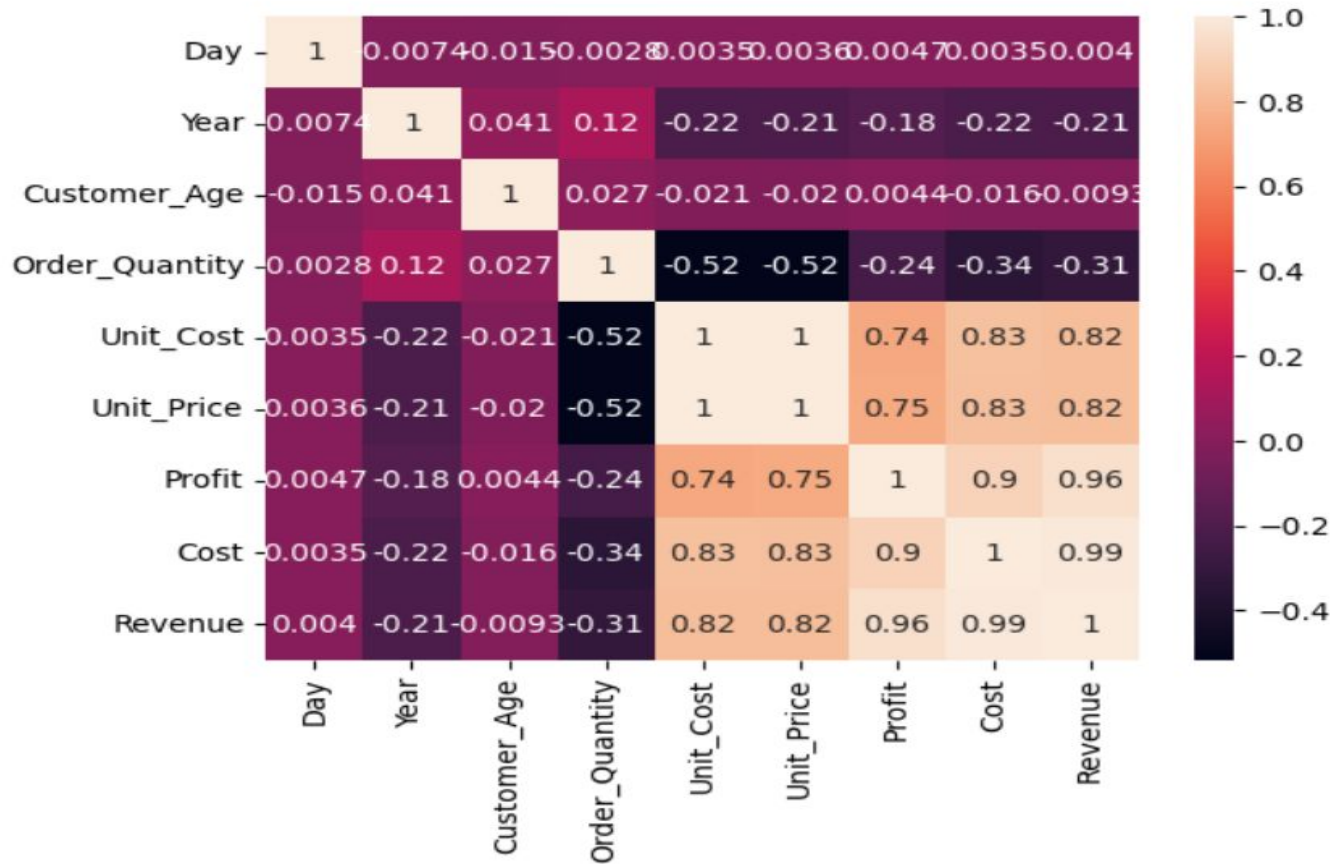
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- There are 112036 observations after removing duplicates.
  - There are 18 columns in the dataset: *Date, Day, Month, Year, Customer\_Age, Age\_Group, Customer\_Gender, Country, State, Product\_Category, Sub\_Category, Product, Order\_Quantity, Unit\_Cost, Unit\_Price, Profit, Cost, Revenue*
  - There are no null values in the dataset.
  - The data spans from January 1, 2011, to July 31, 2016

# SUMMARY STATISTICS



| Statistics         | Customer_Age | Order Quantity | Unit Cost   | Unit Price  | Profit       | Revenue      |
|--------------------|--------------|----------------|-------------|-------------|--------------|--------------|
| Mean               | 36 y/o       | 12             | \$ 268.00   | \$ 454.00   | \$ 286.00    | \$ 757.00    |
| Standard Deviation | 11y/o        | 10             | \$ 550.00   | \$ 923.00   | \$ 455.00    | \$ 1,312.00  |
| Minimum            | 17y/o        | 1              | \$ 1.00     | \$ 2.00     | \$ -30.00    | \$ 2.00      |
| Maximum            | 87y/o        | 32             | \$ 2,171.00 | \$ 3,578.00 | \$ 15,096.00 | \$ 58,074.00 |
| 25%                | 28y/o        | 2              | \$ 2.00     | \$ 5.00     | \$ 29.00     | \$ 64.00     |
| 50%                | 35y/o        | 10             | \$ 9.00     | \$ 25.00    | \$ 103.00    | \$ 226.00    |
| 75%                | 43y/o        | 20             | \$ 42.00    | \$ 70.00    | \$ 360.00    | \$ 806.00    |

# CORRELATION COEFFICIENTS



# Insights on Correlation check



## 1. Profit and Unit Cost (0.74) / Profit and Unit Price (0.75):

- Both profit and unit cost, as well as profit and unit price, have moderately positive correlations (0.74 and 0.75, respectively).
- This suggests that as profit increases, there's a tendency for unit cost and unit price to increase as well.

## 2. Revenue and Unit Cost (0.82) / Revenue and Unit Price (0.82):

- Both revenue and unit cost, as well as revenue and unit price, have strong positive correlations (0.82 for both cases).
- This indicates that as revenue increases, there's a strong tendency for unit cost and unit price to increase as well. This might be due to economies of scale or shifts in pricing strategies.

# Insights on Correlation check



## 3. Revenue and Customer Age (-0.0093):

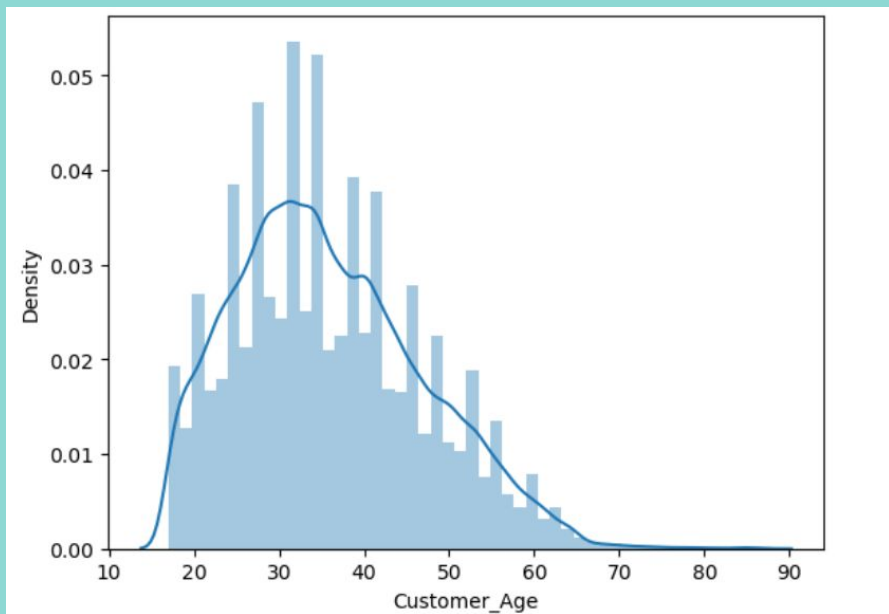
- The correlation between revenue and customer age is very close to zero (-0.0093).
- This suggests that there's almost no linear relationship between the age of customers and the revenue generated. Age doesn't seem to be influencing revenue significantly based on this correlation.

## 4. Revenue and Order Quantity (-0.312):

- There's a moderately negative correlation (-0.312) between revenue and order quantity.
- This indicates that as revenue increases, there's a tendency for order quantity to decrease. This could be due to the sale of high-value products with lower quantities or strategic sales approaches.

**Keep in mind that correlation doesn't imply causation, and these insights are based on linear relationships.**

# Checking the distribution

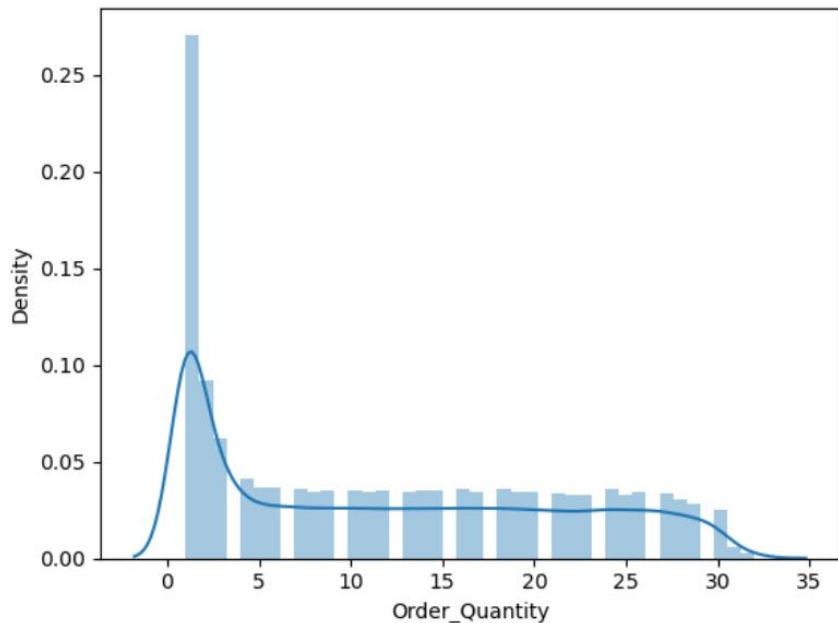


## Customer Age

Skewness Score: (0.52):

- The skewness score of 0.52 suggests a slightly positively skewed distribution.
- This indicates that the majority of customer ages are concentrated on the younger side, with a few older customers trailing off to the right.
- The mean age is likely slightly higher than the median due to the positive skew.

# Checking the distribution



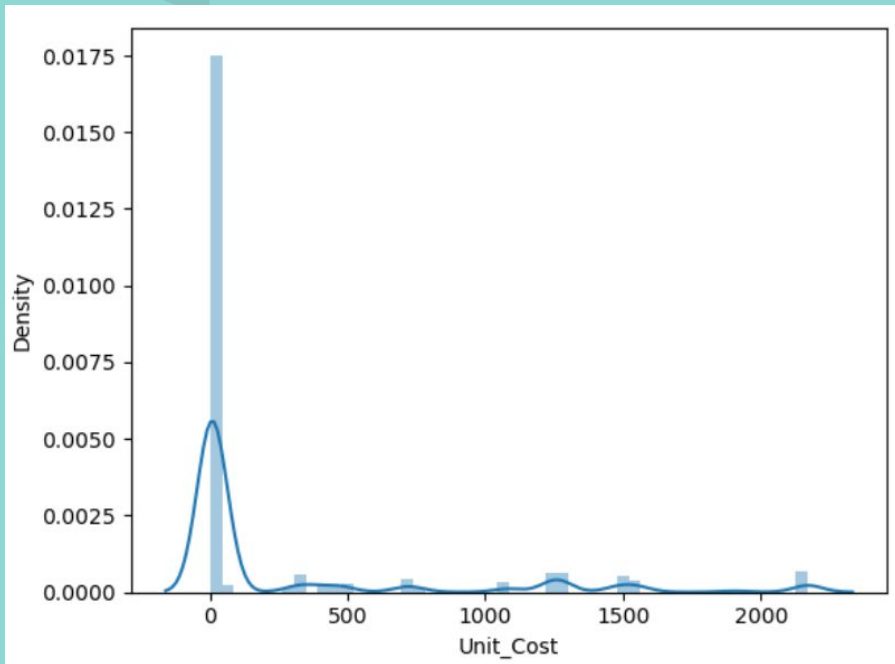
## Order Quantity

Skewness Score: 0.38:

- The skewness score of 0.38 suggests a slightly positively skewed distribution for order quantities.
- Most orders consist of a smaller quantity of items, with a few larger orders on the right side of the distribution.
- Similar to customer age, the mean order quantity is likely slightly higher than the median due to the positive skew.



# Checking the distribution

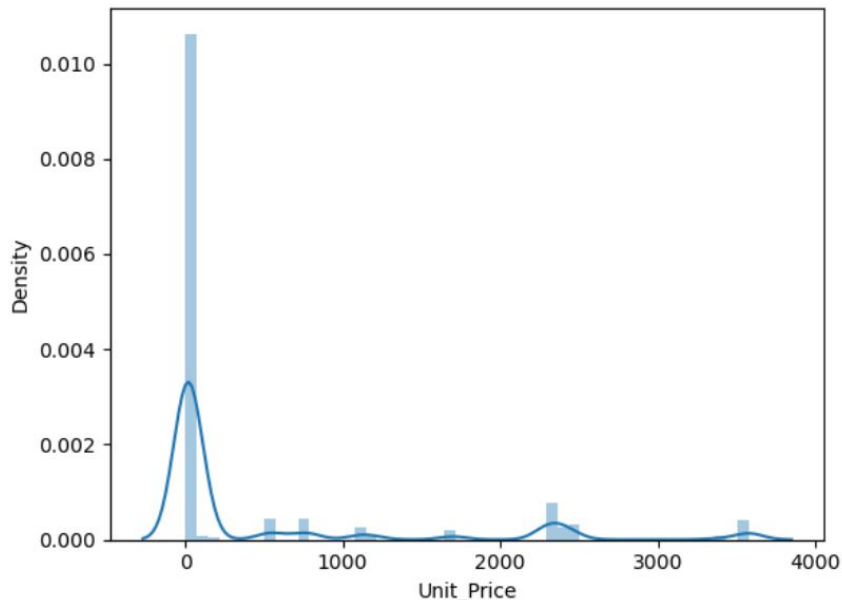


## Unit Cost

Skewness Score: 2.11:

- The skewness score of 2.11 indicates a significantly positively skewed distribution for unit costs.
- This suggests that the majority of products have relatively lower unit costs, with a few products having very high costs on the right side of the distribution.
- In this case, the mean unit cost is likely much higher than the median due to the strong positive skew.

# Checking the distribution

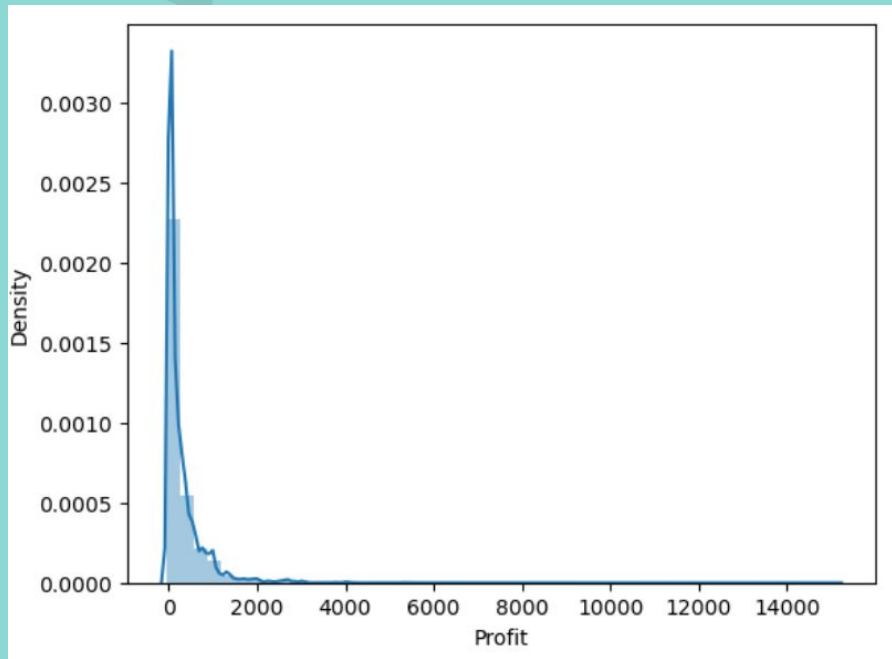


## Unit Price

Skewness Score: 2.08:

- The skewness score of 2.08 also indicates a strongly positively skewed distribution for unit prices.
- Most products have lower unit prices, with a few products having very high prices on the right side of the distribution.
- Similar to unit cost, the mean unit price is likely significantly higher than the median due to the positive skew.

# Checking the distribution

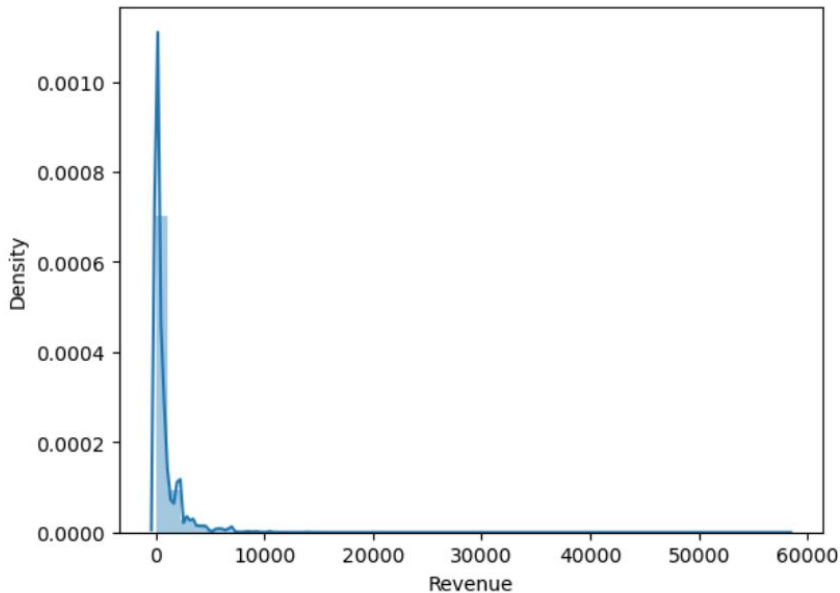


## Profit

Skewness Score: 4

- The skewness score of 4 suggests a strongly positively skewed distribution for profits.
- This indicates that the majority of profit values are concentrated on the lower side, with a few very profitable instances on the right side of the distribution.
- In this case, the mean profit is likely much higher than the median due to the strong positive skew.

# Checking the distribution



## Revenue

Skewness Score: 4.67

- The skewness value of 4.67 for revenue indicates a strong positive skew, implying that most revenue data points are concentrated at lower levels with a long tail of higher values.
- This suggests that a few exceptionally high revenue instances significantly impact the distribution.

# Insights from SQL Queries

The store initially focused on selling bikes in 2011 and 2012. However, in 2013, they expanded their product range to include accessories and clothing. This expansion resulted in a noticeable surge in sales volume and revenue.

## Profit and Revenue by country

--Australia: Australia stands out as the most profitable market, generating \$15,096 in profit and the highest revenue at \$58,074. It is both the most profitable and revenue-generating country.

--Canada: Canada is the third-highest profit-generating country at \$5,628 and the second-highest revenue-generating country at \$14,312.

--United States: The United States follows as the second-highest profit-generating country with \$5,638 in profit and the fourth-highest revenue at \$14,026.

--Germany: Germany ranks as the fourth-highest profit-generating country with \$5,485 in profit and the third-highest revenue at \$14,169.

--United Kingdom and France: The United Kingdom and France share the same positions, ranking as the fifth-highest in both profit and revenue, each with \$5,056 in profit and \$13,740 in revenue.

# Insights from SQL Queries



## Customer\_Age

- The 35 to 64 age bracket secured the highest profit share at 51%.
- Seniors attained the lowest share, accounting for just 0.4%
- The trend remained consistent from 2011 to 2016, with the highest profit consistently achieved by the Adults (35-64) group, followed by the Young Adults (25-34) group in second place, the Youth (<25) group in third, and Seniors (64+) with the lowest profit.

# Insights from SQL Queries



## Product Category

- --The "bike" category maintains consistent profitability, revenue, and sales volume from 2011 to 2016.
- --The increase in profit and sales volume in 2013 was attributable to the store's introduction of new product categories during that year.
- --In terms of revenue, Bikes remain consistent

## Bikes

- ----In the Bike category, road bikes got the highest. Touring bike got the lowest across Profit, Revenue and Sales Volume

# Insights from SQL Queries



## Product Category

### Clothing

- --In terms of profitability, shorts ranked highest, while caps had the lowest profit margin.
- --jerseys got the highest and vests the lowest, it is interesting that caps got the lowest profit but came 2nd when it comes to sales volume
- --The implication of this statement is that there is a surprising or unexpected relationship between the profit margin and sales volume of caps.
- --Despite caps having the lowest profit margin, they managed to achieve the second-highest sales volume.
- --This suggests that caps may have a strong market demand or a large customer base, which compensates for their lower profit margin. It also raises the possibility of exploring strategies to increase the profitability of caps without compromising their popularity among customers.
- --In terms of revenue, Jerseys ranked highest, while socks had the lowest profit margin.



# Insights from SQL Queries



## Product Category

### Accessories

- When it comes to sales volume, tires and tubes were the top performers, while bike stands had the lowest sales.
- Helmets generated the highest profit and revenue but took the third spot in terms of sales volume.

## Mark Up

- The highest markup, which stands at 77.77, is associated with six products from the Clothing category and one from the Accessories category.
- It is interesting to note that the Helmet sub-category yielded the highest profit, yet it didn't secure a top position in terms of markup value.
- The unit cost and unit price also fluctuates

# Insights from SQL Queries



- In terms of location, the US has the highest profit, while France has the lowest.
- In terms of revenue, USA got the highest and Canada got the lowest
- It's intriguing to notice that in the USA, Australia, and Canada, Germany the majority of customers are male.
- This could suggest a strong male demographic interest in cycling-related products in these countries.
- Conversely, in the United Kingdom, France where the customer base leans more towards females.

# Insights from SQL Queries



When considering gender by country, the distribution is as follows:

USA: More males

Australia: More females

United Kingdom: More females

Canada: More males

Germany: More females

France: More males

- It's interesting to note that the distribution of gender in terms of profit and sales volume doesn't necessarily match in every country. For example, in the USA, there are more males contributing to both profit and sales volume. However, in the United Kingdom, more females contribute to profit, but more males contribute to sales volume.

# Insights from SQL Queries

What is the most selling product in each country

- In the US, top 2 most selling products are "Mountain-200 Silver, 42" and "Road-150 Red, 52". Both Bikes category.
  - In Canada, top 2 most selling products are "Mountain-200 Silver, 42" and "Sport-100 Helmet, Blue". Bikes and Accessories categories
  - In Australia, the best-selling bike is the Road-150 Red, 62, while the Mountain-200 Black, 38 takes the second position.
  - In Germany, the top two selling bikes are the Mountain-200 Silver, 46 and the Mountain-200 Silver, 42.
  - In France, Sport-100 Helmet, Red is the best selling which is an accessory.
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- Among all the products, the Mountain-200 Black, 38 contributes the highest to profits.
  - When it comes to the sales volume, the Water Bottle - 30 oz. ranks the highest.