Analyzing Customer Data for Business Insights

Questions:

1. **Find the AOV (Average order value) for the year 2017 where the Ship mode is Second Class.**

Answer: Understanding Average Order Value (AOV): The average order value (AOV) is Rs 221.1349874. This metric tells us the typical amount a customer spends per order.

How We Calculated AOV

We used Excel's AVERAGEIFS function to determine the AOV specifically for the year 2017. This function is handy for calculating averages based on multiple conditions.

The Formula Explained:

Here's a breakdown of the formula used:

Excel

=AVERAGEIFS(S:S, D:D, 2017)

- AVERAGEIFS: This function calculates the average of values that meet one or more criteria.
- S:S: This represents the range of cells containing the sales data we want to average. In this case, it's column S.
- D:D, 2017: This defines the criteria for selecting data.
    - D:D: This references column D, which likely contains the year for each order.
    - 2017: This specifies that we only want to consider sales data from the year 2017.

What the Formula Does:

The formula essentially calculates the average of all sales values in column S where the corresponding year in column D is 2017. This provides us with the AOV for the year 2017 (Rs 221.1349874).

By understanding the AOV, we can gain valuable insights into customer buying behavior and identify areas for improvement, such as encouraging larger orders through promotions or product bundling.

2. **Find the top 3 states which offered the highest discount in the year 2015 .**

Answer: Top 3 states are –(i)Texas (364.64) (ii) Pennsylvania (192.9) (iii) Illinois (191.9)

Identifying Top States with Highest Discounts (2015)

This analysis reveals the top 3 states with the highest total discounts offered in the year 2015.

Finding the Top Spenders:

1. **Data Preparation:**
    - Ensure your data includes columns for "Order Date," "State," and "Discount."
2. **Isolate 2015 Data (Optional):**
    - If your data spans multiple years, filter the "Order Date" column to show entries only for the year 2015. You can achieve this by using the filter options within Excel.
3. **Calculate Total Discount per State:**
    - Introduce a new column (e.g., column W) to store the total discount for each state.
    - In the header cell (W1), enter a label like "Total Discount."
    - In cell W2, enter the following formula and drag it down to apply it to all states:

    Excel
    ```
    =SUMIFS(U:U, S:S, S2)
    ```

    - Explanation:
        - SUMIFS: This function calculates the sum of values in a range (U:U, representing the "Discount" column) that meet multiple criteria.
        - S:S: This references the "State" column.
        - S2: This refers to the first cell containing a state name (adjust based on your data starting point).
4. **Rank States by Discount:**
    - Select both the "State" and "Total Discount" columns.
    - Navigate to the "Data" tab and choose "Sort."
    - Sort the data by the "Total Discount" column in descending order (highest to lowest).

5. **Identify Top 3 States:**
    - The sorted data will display states with the highest total discounts at the top.
    - The top 3 states on this list represent those offering the highest discounts in 2015.

Key Points:

- This process leverages the SUMIFS function to calculate the total discount per state based on the "Discount" and "State" columns.
- Sorting by the "Total Discount" column allows for easy identification of the top spenders.

Optional Step:

- After obtaining the top 3 states, you can remove the 2015 filter (if applied) by clearing the filter on the "Order Date" column.

3. Find the highest-selling category for the state of California where the segment is "Home Office".

Answer : Category = Technology is highest selling (32833.014)

Identifying Top-Selling Category for Home Office in California (2015)

This analysis determines the highest-selling product category within the "Home Office" segment for the state of California.

Steps to Identify the Top Seller:

1. **Data Preparation:**
    - Ensure your data includes columns for "State," "Segment," "Category," and "Sales."
2. **Filter by California and Home Office:**
    - Apply filters to the "State" and "Segment" columns.
    - In the "State" filter, select "California."
    - In the "Segment" filter, select "Home Office."

3. **Calculate Total Sales per Category:**
    - Introduce a new column (e.g., column X) to store the total sales for each category within the filtered data.
    - In the header cell (X1), enter a label like "Total Sales."
    - In cell X2, enter the following formula and drag it down to apply it to all categories:

```
Excel
=SUMIFS(S:S, L:L, "California", I:I, "Home Office", P:P, P2)
```

    - Breakdown of the Formula:
        - SUMIFS: This function calculates the sum of values in a range (S:S, representing the "Sales" column) that meet multiple criteria.
        - L:L: This references the "State" column.
        - "California": This specifies the filter criteria for the state.
        - I:I: This references the "Segment" column.
        - "Home Office": This specifies the filter criteria for the segment.
        - P:P: This references the "Category" column.
        - P2: This refers to the first cell containing a category name (adjust based on your data starting point).
4. **Identify Top-Selling Category:**
    - Analyze the "Total Sales" column. The category with the highest total sales value represents the top seller within the filtered data (California, Home Office).
5. **Optional: Remove Filters**
    - After identifying the top seller, you can remove the applied filters by clearing the selections in the "State" and "Segment" column filters.

Key Points:

- The SUMIFS function plays a crucial role in calculating category-wise total sales based on the applied filters (California and Home Office).
- Examining the "Total Sales" column readily reveals the category with the highest sales figures.

By following these steps, you can effectively determine the most popular product category within the "Home Office" segment for the state of California.

4.Find the % increase/decrease in sales for the state of Kentucky from 2014 -2015.

Answer : Total sales of Kentucky state in 2014 =8280.46

Total sales of Kentucky state in 2015 = 7673.56

In 2014-2015 Kentucky states sales trend is in decreasing order rate -7.3%.

Kentucky Sales Trend Analysis (2014-2015)

This report examines sales trends for Kentucky between 2014 and 2015.

Sales Performance:

- We can calculate the total sales for each year using the SUMIFS function in Excel.

Year	Total Sales	Formula
2014	Y2	=**SUMIFS(T:T, L:L, "Kentucky", E:E, 2014)**
2015	Y3	**=SUMIFS(T:T, L:L, "Kentucky", D:D, 2015)**

- Replace T:T with the actual range of your "Sales" data.
- Replace L:L with the actual range of your "State" data.
- Replace E:E and D:D with the actual ranges of your "Year" data (assuming years are in separate columns).

Sales Trend:

- By comparing the total sales figures, we can determine the sales trend for Kentucky.

Calculating the Change:

- A formula can be used to calculate the exact percentage change in sales between 2014 and 2015:

Excel
= ((Y3-Y2)/Y2) * 100

- Y3: Total sales for Kentucky in 2015 (previously calculated)
- Y2: Total sales for Kentucky in 2014 (previously calculated)

- This formula calculates the difference in sales between 2015 and 2014, divides it by the sales in 2014, and converts the result to a percentage.

Interpretation:

- By entering the formula in a separate cell (e.g., Z2), Excel will automatically calculate the percentage change.
- A positive result indicates an increase in sales, while a negative result indicates a decrease.

Following these steps will help you analyze Kentucky's sales trend from 2014 to 2015 and determine the percentage change using clear explanations and relevant formulas.

4. **For the Year 2017 - (period 1st Jan to 31st Dec 2017), what is the customer retention for all states combined?**

Answer: X=Reataned customers 2017 : 2121

Y =Not Retaned customer 2017: 1198.

Z =Total Unique customer 2017 :3319.

Customer Retantion rate (2017) :X/Z*100 =63.904%

Analyzing Customer Retention in 2017

This analysis explores customer retention rates for the year 2017. Here's a breakdown of the process:

1. Categorizing Purchase Periods:

- A helper column (e.g., column Z) is introduced to classify purchase periods.
- The formula in cell Z2 (and copied down) achieves this categorization:

Excel

```
=IF(AND(C2>=DATE(2017,1,1),A2<=DATE(2017,6,30)),"First Half", IF(AND(C2>=DATE(2017,7,1), C2<=DATE(2017,12,31)), "Second Half", ""))
```

- Explanation:
    - IF function: Evaluates conditions and returns corresponding values.
    - AND function: Ensures all specified conditions are true.

- DATE(year, month, day): Creates a date serial number.
- C2: Assuming this cell contains the order date.
- The formula checks if the order date falls within the first half (Jan 1st to June 30th) or second half (July 1st to Dec 31st) of 2017. It assigns labels ("First Half" or "Second Half") accordingly.

2. Identifying Retained Customers:

- Another helper column (e.g., column AA) is created to identify customers who made purchases in both halves of 2017.
- The formula in cell AA2 (and copied down) addresses this:

Excel

```
=IF(COUNTIFS($Z:$Z,"FirstHalf",$H:$H,H2)>0,IF(COUNTIFS($Z:$Z,"Second Half",$H:$H,H2)>0, "Yes", "No"), "No")
```

- Explanation:
  - COUNTIFS function: Counts cells meeting multiple criteria.
  - $Z:$Z: Range of the "Period" column (referring to step 1).
  - "First Half": Criteria to match in the "Period" column.
  - $H:$H: Range of the "Customer ID" column.
  - H2: Assuming this cell contains the customer ID.
  - The formula checks if the customer ID exists in both "First Half" and "Second Half" sections of the "Period" column for the corresponding customer ID row. If a purchase exists in both halves, "Yes" is assigned; otherwise, "No".

3. Customer Retention Calculation:

- Once the "Retention" column (column AA) is populated, count the number of "Yes" values. This represents the number of customers who made purchases in both halves of 2017 (retained customers).

4. Customer Retention Rate:

- Divide the count of retained customers by the total number of unique customers in 2017.
- Multiply the result by 100 to express the customer retention rate as a percentage.

By following these steps and using the provided formulas, you can effectively calculate customer retention rates for the year 2017 in your Excel dataset. This analysis provides valuable insights

into customer loyalty and helps assess the effectiveness of your customer relationship management strategies.

5. What is the repeat % of customers buying furniture in the year 2016 in the South region.

Answer: Retaned customer 2016 : 4.

Not Retaned customer 2016: 81.

Total Unique customer 2016 : 2.

Repeat % (2016)= 200%

Analyzing Repeat Furniture Customers in the South (2016)

This report investigates the repeat customer rate for furniture purchases within the South region during 2016.

Data Preparation:

1. **Filter by Category, Region, and Year:**
    - Utilize the filter options in Excel to narrow down your data.
    - In the "Category" filter, select "Furniture."
    - In the "Region" filter, select "South."
    - In the "Year" filter, select "2016."

Identifying Repeat Customers:

2. **Leveraging the "Retention" Column:**
    - The "Retention" column (assuming column X) plays a key role in identifying repeat customers.
    - This column should contain "Yes" for retained customers and "No" for non-retained customers.

Calculating Repeat Rate:

3. **Counting Retained Customers:**
    - A formula will be used to determine the number of repeat customers who purchased furniture in the South region during 2016. The formula in a cell (e.g., Y2) can be:

Excel
```
=COUNTIFS(X:X, "Yes", P:P, "Furniture", N:N, "South", D:D, 2016)
```

- Breakdown of the Formula:
  - X:X: Range of the "Retention" column.
  - "Yes": Criteria to identify retained customers.
  - P:P: Range of the "Category" column.
  - "Furniture": Criteria to identify furniture purchases.
  - N:N: Range of the "Region" column.
  - "South": Criteria to identify purchases in the South region.
  - D:D: Range of the "Year" column.
  - 2016: Criteria to identify purchases in 2016.

4. **Counting Total Unique Customers:**
   - Another formula will calculate the total number of unique customers who purchased furniture in the South region during 2016. This can be placed in a separate cell (e.g., Y3):

Excel
```
=COUNTIFS(H:H, H2, G:G, "Furniture", M:M, "South", D:D, 2016)
```

   - Explanation:
     - H:H: Range of the "Customer ID" column.
     - H2: Assuming this cell contains the first customer ID.
     - G:G, "Furniture", M:M, "South", D:D, 2016: Similar criteria as the previous formula.

5. **Calculating Repeat Percentage:**
   - Finally, the repeat customer rate can be calculated using the following formula in another cell (e.g., Y4):

Excel
```
= (Y2 / Y3) * 100
```

- This formula divides the count of retained customers who purchased furniture in the South region in 2016 (Y2) by the total number of unique customers who purchased furniture in the South region in 2016 (Y3).
- The result is then multiplied by 100 to express the repeat percentage.

Interpretation:

By following these steps and using the provided formulas, you can effectively determine the repeat customer rate for furniture purchases within the South region during 2016. This analysis offers valuable insights into customer loyalty and buying behavior for your furniture products in that specific region.