Power BI Project Explanation

The objective of this project is to design an interactive **Customer Retention Analytic Dashboard** using Power BI to analyze customer behavior, identify churn patterns, segment high-value customers, and provide actionable insights to improve customer retention, loyalty engagement, and overall business performance.

Data-set used in this project
1. Customer Demography   4.Loyalty program
2. Customer Transaction   5.Store location
3. Churn labbeled customer

Task-1 Data Modeling & Cleaning

This task is basically about to load the data set into power quarry editor and transform those, in transformation I basically remove all duplicate and handle the missing value and ensured correct data types for date and numeric fields.After that I close and apply that into power-bi. In the next step I create calculated column for to calculate membership duration and I column I used the function*(DATEDIFF(Customer_Demographics[Membership_Since], TODAY(), DAY)* through this function I extract the duration of day from membership since to Today.
I use another calculated column to extract the year part from the transaction date in the column I perform the function *YEAR(Customer_Transactions[Transaction_Date])* similarly to extract month column I use the Format function to format the date into month
FORMAT(Customer_Transactions[Transaction_Date],"MMM") at the end I create Relationship among the data set in the model view .
The relationship are;

- One-to-many: Customer → Transactions, Loyalty, Churn

- Many-to-one: Transactions → Store Locations
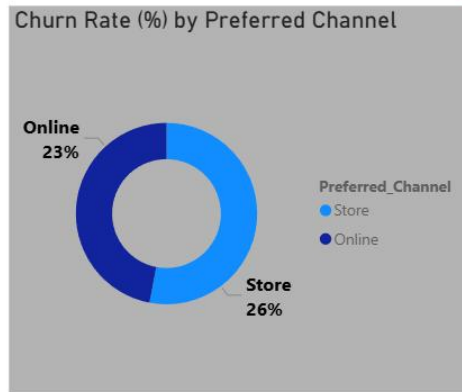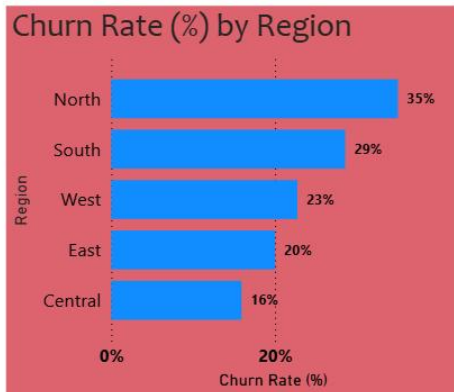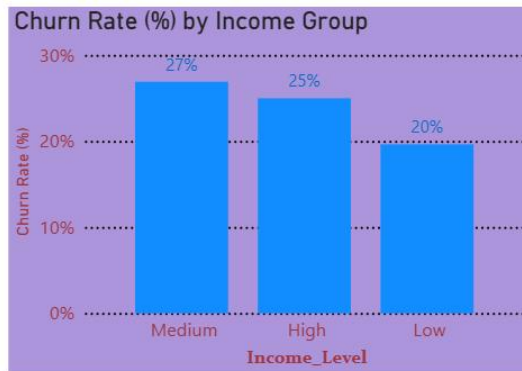
Task-2 Churn & Retention Metrics

First step I need to calculate Churn Rate=(Churned customer/Total customer)*100
To calculate churned customer I use the measure in this I use calculate function
CALCULATE(DISTINCTCOUNT(Churn_Labeled_Customers[Customer_ID]),Churn_Labeled_Customers[Churn_Flag] = 1) after that i calculate the total customer by using DISTINCT COUNT function in measure
DISTINCTCOUNT(Customer_Demographics[Customer_ID])
After that I use the divide function to calculate churn rate *DIVIDE([Churned Customers], [Total Customers]) * 100*
After calculation of churn rate I use different visual to show;

Churn Rate

25%
Churn Rate (%)

Churn Rate (%) by Income Group

Income_Level	Churn Rate (%)
Medium	27%
High	25%
Low	20%

Churn Rate (%) by Loyalty Tier

Plus 16%
Elite 29%
Premium 28%
Basic 26%

Loyalty_Tier
- Elite
- Premium
- Basic
- Plus

Churn Rate (%) by Region

Region	Churn Rate (%)
North	35%
South	29%
West	23%
East	20%
Central	16%

Churn Rate (%) by Preferred Channel

Online 23%
Store 26%

Preferred_Channel
- Store
- Online

 To show only churn rate I use card visual,to show churn rate by income group I use clustered column chart, to show churn rate by region I use clustered bar chart , to show churn rate by preferred channel I use donut chart and at the end to show churn rate by Loyalty tier I use pie chart.

Total customer, Repeat Customers and Churned customer

100%

Total customer	200
Repeat Customers	191
Churned customer	49

24.5%
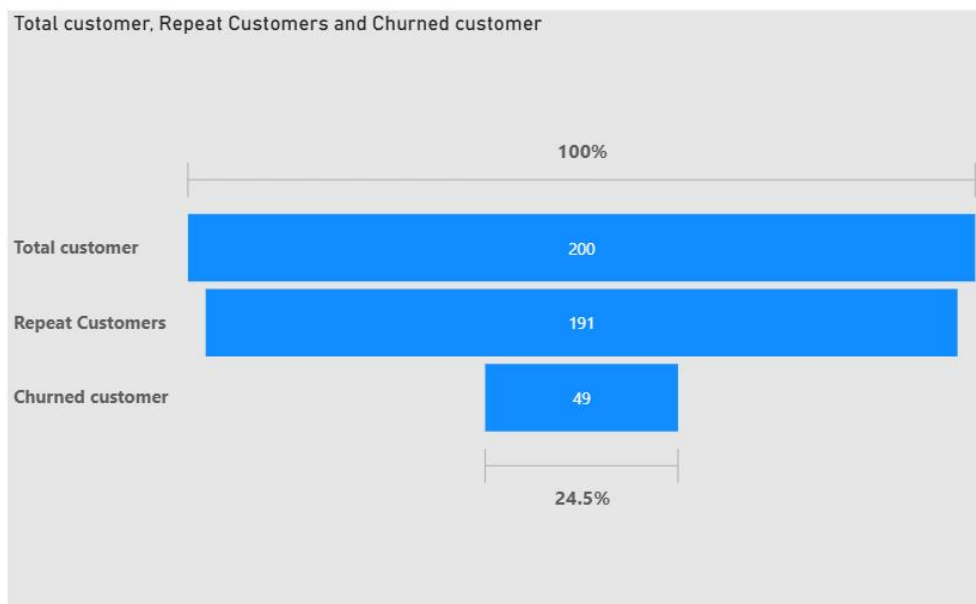
This is the funnel chart which show out of 200 total customer 191 are repeated customer 95.5% of the total and 49 are churned customer which is 24.5% of total.

Task 3 Repeat Purchase Analysis

In this task before segment customer on the basis of purchase I need to calculate purchase count for each customer to calculate purchase count I insert a calculated column and use the calculate and filter function *CALCULATE(COUNT(Customer_Transactions[Transaction_ID]),FILTER(Customer_Transactions,Customer_Transactions[Customer_ID]= EARLIER(Customer_Transactions[Customer_ID])))*

After that I segment the customer by using IF function *IF(Customer_Transactions[Purchase_Count] <= 3, "Low-Tier",IF(Customer_Transactions[Purchase_Count] <= 8, "Mid-Tier","High-Tier"))*

ction Year	Transaction month	Purchase_Count	Customer_Segment
2023 Apr		4	Mid-Tier
2023 Jun		4	Mid-Tier
2023 May		5	Mid-Tier
2023 Jul		5	Mid-Tier
2024 Jun		6	Mid-Tier
2024 Feb		10	High-Tier
2024 Feb		10	High-Tier
2024 Mar		6	Mid-Tier
2024 Mar		6	Mid-Tier
2023 Feb		6	Mid-Tier
2024 Jun		7	Mid-Tier
2024 Aug		9	High-Tier
2023 Oct		6	Mid-Tier
2023 Jan		10	High-Tier
2023 Dec		7	Mid-Tier
2024 Jun		3	Low-Tier
2024 May		7	Mid-Tier
2023 Jan		6	Mid-Tier
2024 Jun		3	Low-Tier
2024 Mar		7	Mid-Tier
2024 Jan		10	High-Tier
2024 Aug		4	Mid-Tier
2023 Jun		6	Mid-Tier
2023 Jun		6	Mid-Tier
2024 May		4	Mid-Tier

This is the screen shot of the calculated column

In next step I calculate the average purchase frequency by using average function as a measure in average I use purchase count . *AVERAGE(Customer_Transactions[Purchase_Count])*
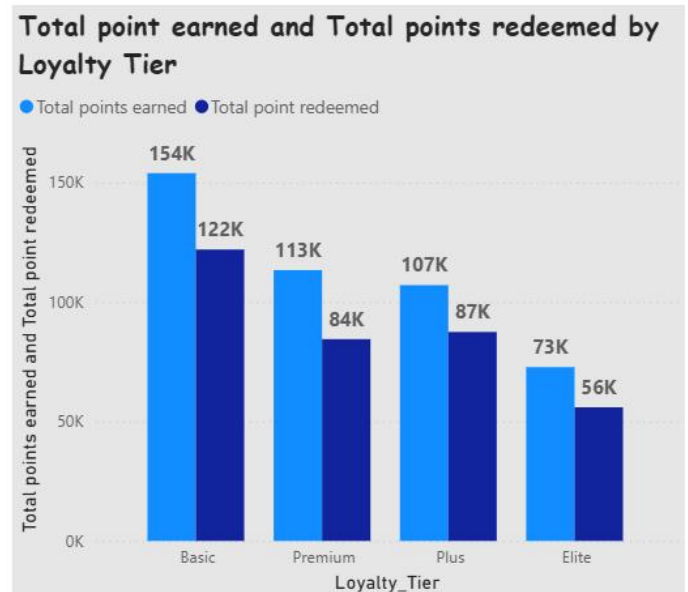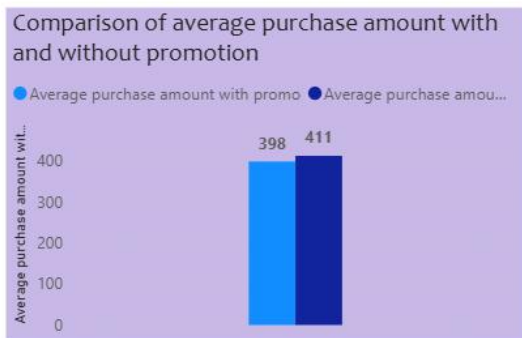
After calculating average purchase frequency I use in the visual to show by different parameter
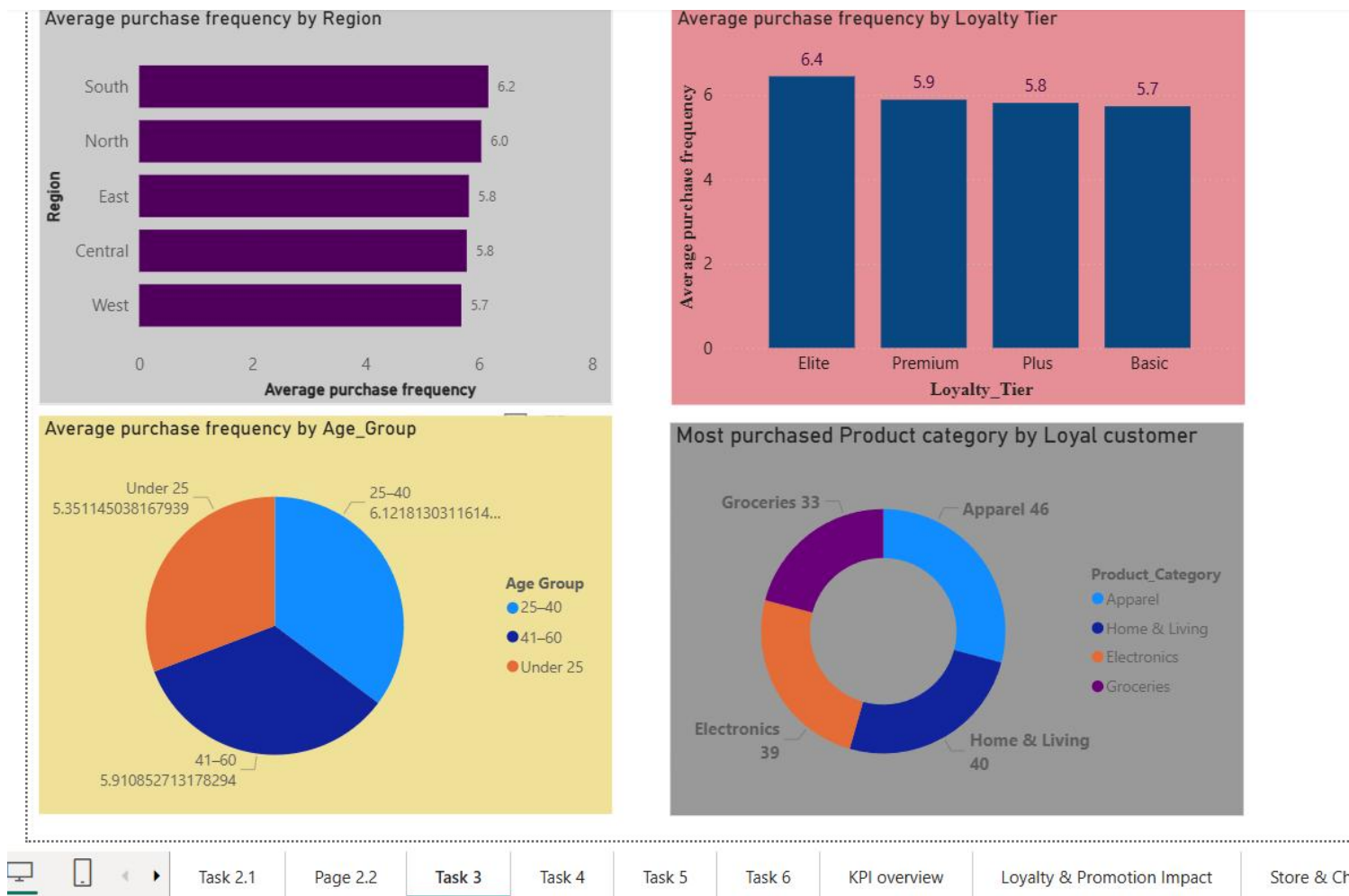
 To show average purchase frequency by Region I use clustered bar chart,to show average purchase frequency by loyalty tier I use clustered column chart and to show average purchase frequency by age group I use pie chart. To grouping the age I use calculated column and use if function and group the age into 3 group 1st one is Under 25 2nd one is 25-40 and the 3rd one is 41-60.

The Donut chart is used to show the most purchased product category by loyalty customer to show loyalty customer in the chart I put the transaction id in the value column and change into count and in the filter panel I insert customer segment column and select only high tier because high tier is who is made 9 or more then 9 transaction. From the donut chart i find out the most purchased product category is **Apparel** which is 46 loyal customer.

Task 4 Promotion & Loyalty Impact

This task is basically about to analyse the impact of promotion in the loyalty of customers

In the first step I need to visualize the percentage of transaction with promotion applied so first I need to calculate the total of promo transaction for this I use the measure and use calculate function Promo transaction = *CALCULATE([Total Transactions],Customer_Transactions[Promotion_Applied]="yes")* after that I use another measure to calculate percentage of promo transaction by using divide function % of promo transaction = *DIVIDE([Promo transaction],[Total Transactions],0)* then next for visualization I use the card visual.

Churn Rate (%) by Loyalty Tier

Plus 16%
Elite 29%
Basic 26%
Premium 28%

Loyalty_Tier
● Elite
● Premium
● Basic
● Plus

Percentage of Transactions with Promotion Applied

39.3%
% of promo transaction

Comparison of average purchase amount with and without promotion

● Average purchase amount with promo ● Average purchase amou...

398 411

Total point earned and Total points redeemed by Loyalty Tier

● Total points earned ● Total point redeemed

Basic: 154K / 122K
Premium: 113K / 84K
Plus: 107K / 87K
Elite: 73K / 56K

For to show the Compare average purchase amount with vs. without promotions first I need to calculate the average purchase amount with and without promo for this I use the measure in this I use calculate function Average purchase amount with promo =
CALCULATE(AVERAGE(Customer_Transactions[Amount]),Customer_Transactions[Promotion_Applied]="yes")
Average purchase amount without promo =
CALCULATE(AVERAGE(Customer_Transactions[Amount]),Customer_Transactions[Promotion_Applied]="no")
Then I insert the cluster column chart to show the comparison and from the chart it show that average purchase amount without promo is higher then with promo.
To show churn rate by Loyalty tier I use donut chart and churn rate already calculated in the task 2 so simply add those in donut chart.I analyse that the churn rate for elite tier customer is high which is 29%.
To Visualize Points Earned vs. Redeemed by Tier first I need to calculate total points earned and total points redeemed to calculate those I use the measure.
Total points earned = *SUM(Loyalty_Program[Points_Earned])*
Total point redeemed = *SUM(Loyalty_Program[Points_Redeemed])*
To visualize those I use cluster column chart.
Recommendation to improve Redemption & Retention
1. Improve Loyalty Point Redemption Awareness because Customers in lower loyalty tiers accumulate points but do not actively redeem them.
2. Strengthen Loyalty Tier Benefits because Higher-tier customers show better retention, so increase benefits for mid-tier customers to motivate upgrades to premium tiers.
3. Design engagement-based campaigns for inactive customers to reduce Churn Through Engagement-Based Offers.

Task 5 Store & Channel Performance vs Retention
In this task to evaluate how store characteristics and channels influence transaction value and customer retention, and to assess whether store age has a relationship with retention performance.
First i need to calculate average transaction amount to visualize average transaction amount by store type by using measure Average transaction amount = *AVERAGE(Customer_Transactions[Amount])* after this I

use clustered column chart form the chart it show that superstores are generating the highest average transaction amount i.e.422.55
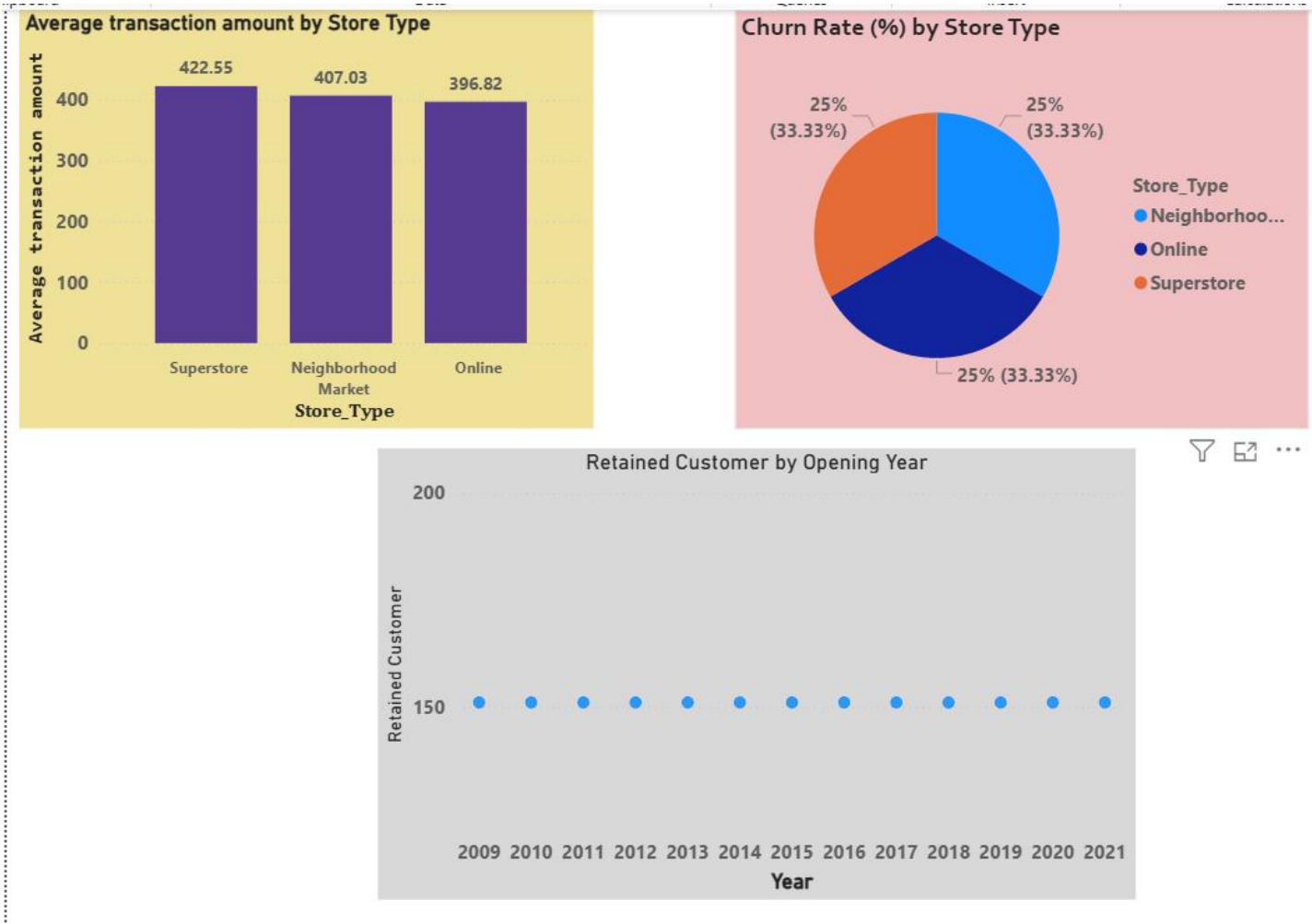
To visualize churn rate by store type I use the donut chart

To visualize correlation between store opening year and retained customer first I need to calculate retained customer for this I use the measure Retained Customer = CALCULATE(DISTINCTCOUNT(Churn_Labeled_Customers[Customer_ID]),Churn_Labeled_Customers[Churn_Flag]=0) after this I use the scatter chart and from the chart its showing that there is no strong relation between store opening year and customer retention.

Task 6 Customer Lifetime Value(CLV) Analysis

In this task going to analysis the customer lifetime value and segment those customers on the basis of their CLV. This analysis helps the business to identify customer who contribute more value over time.

First step is to calculate the CLV for this I have to calculate total spend per customer for this I use measure and also use calculate function Total spend per customer = CALCULATE(SUM(Customer_Transactions[Amount]), ALLEXCEPT(Customer_Demographics,Customer_Demographics[Customer_ID])) after this I calculate total membership duration in year by using Datediff in measure.

Membership duration = DATEDIFF(Customer_Demographics[Membership_Since],TODAY(),DAY) after that convert the membership duration to year by using divide function in measure.

Customer membership years = DIVIDE(MAX(Customer_Demographics[Membership duration]),365)

After this simply use divide function in measure to calculate CLV.

CLV = DIVIDE([Total spend per customer],[Customer membership years],0)

After this I calculate average CLV for next task by using averagex function.

Average CLV = AVERAGEX(VALUES(Customer_Demographics[Customer_ID]),[CLV])

After calculating clv the next task is to segment customer into Low, High CLV for this I use the calculated column and use IF function to segment.

CLV segment = IF(Customer_Demographics[Customer wise CLV] >= [Average CLV],"High CLV","Low CLV")

Everything set the next task is to visualize;
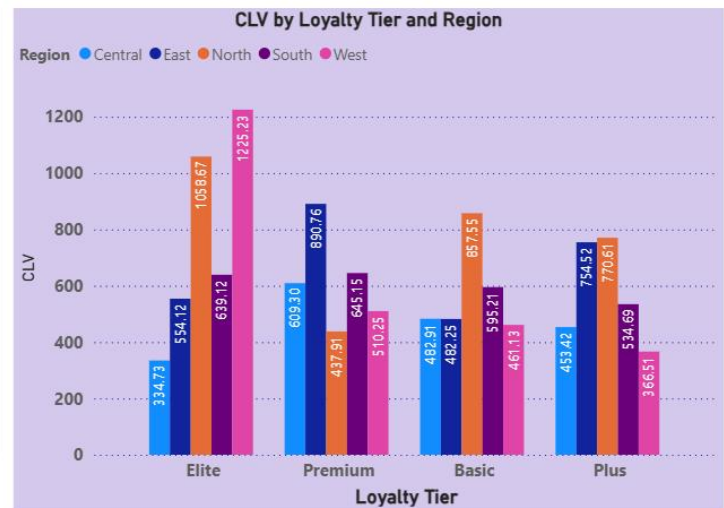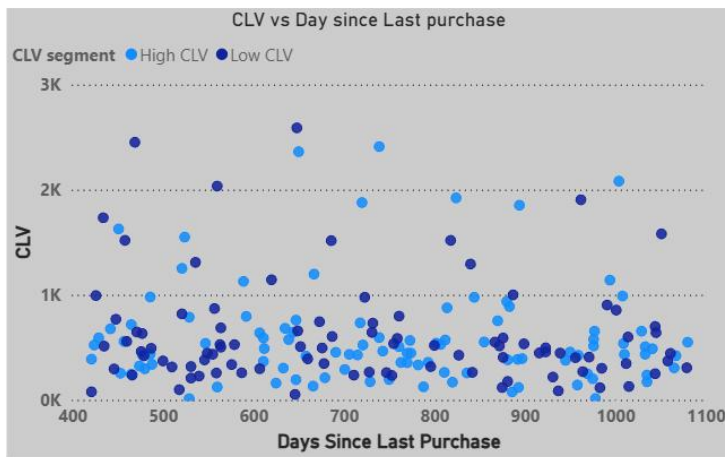
To visualize CLV by Day since last purchase I use scatter chart.
To visualize CLV by loyalty tier and region I use the clustered column chart.

Task 7 Final Dashboard & Executive Summary

The objective of Task 7 is to bring together all analyses performed in previous tasks and present them in a clear, interactive dashboard. Dashboard is the summery of reports.

The final dashboard is designed with four pages, each focusing on a specific business question.

First page is about KPIs (Churn, CLV, Repeat Rate) to visualize KPIs I use the card visuals to show the individuals.The Churn Rate shows the percentage of customers who have stopped purchasing the Repeat Rate highlights how many customers return to make additional purchases which show the loyalty of the customer and at the end The Average CLV represents the average value generated by a customer over their relationship with the business.
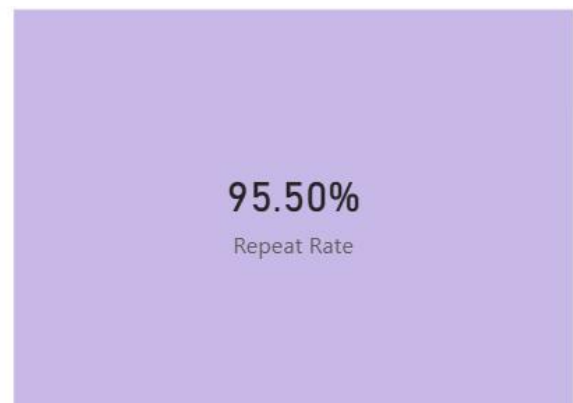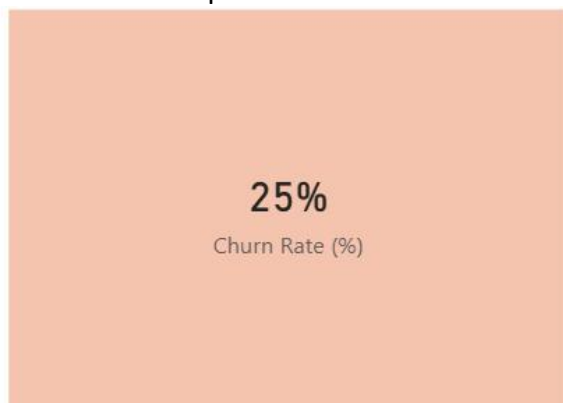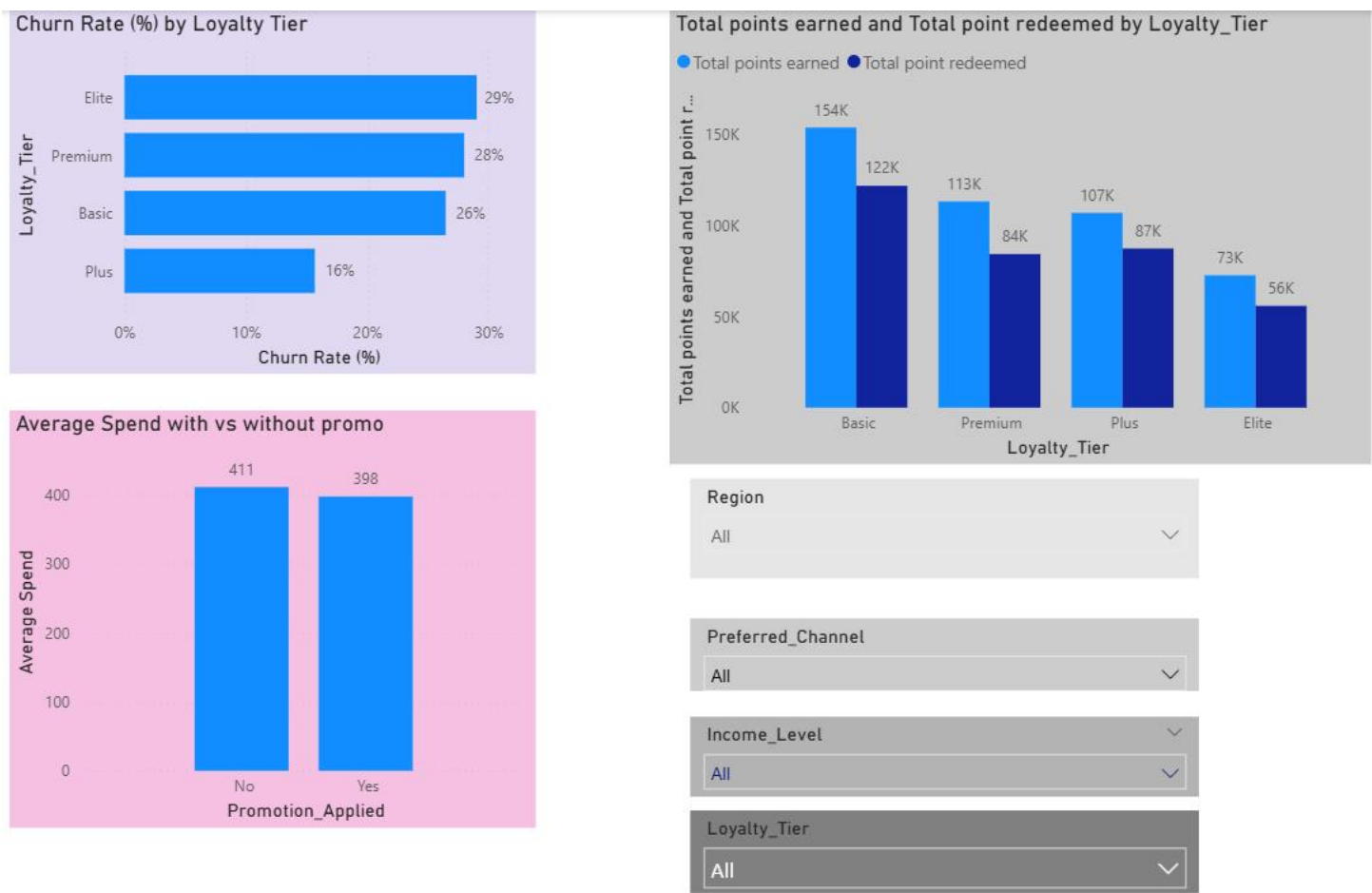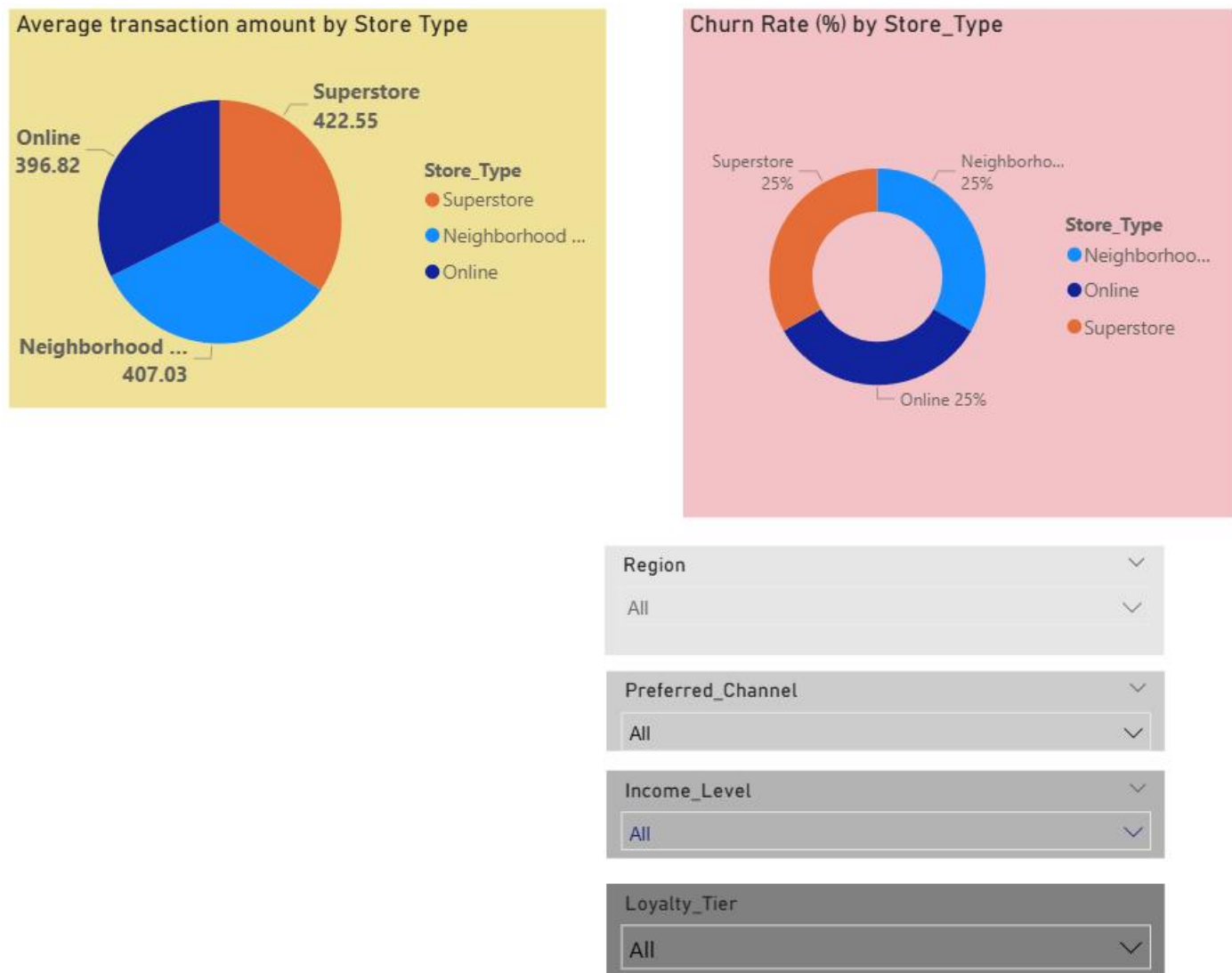
Second page is about to analyzes how loyalty programs and promotions influence customer behavior.

Churn Rate (%) by Loyalty Tier

Total points earned and Total point redeemed by Loyalty_Tier

● Total points earned ● Total point redeemed

Average Spend with vs without promo

Region
All ⌄

Preferred_Channel
All ⌄

Income_Level
All ⌄

Loyalty_Tier
All ⌄

The churn rate by loyalty tier shows that higher loyalty tiers generally experience lower churn, indicating stronger customer engagement.The average spend by promotion applied compares customer spending with and without promotions, helping evaluate promotion effectiveness.The points earned vs redeemed visual highlights how actively customers use loyalty rewards.

Third page is focus on store performance and customer behavior across channels.

Average transaction amount by Store Type

Superstore
422.55

Online
396.82

Store_Type
● Superstore
● Neighborhood ...
● Online

Neighborhood ...
407.03

Churn Rate (%) by Store_Type

Superstore
25%

Neighborho...
25%

Store_Type
● Neighborhoo...
● Online
● Superstore

Online 25%

Region	
All	⌄

Preferred_Channel	
All	⌄

Income_Level	
All	⌄

Loyalty_Tier	
All	⌄

The average transaction amount by store type shows which store formats generate higher purchase values.To visualize this I use the donut chart.The churn rate by store type identifies store types with higher customer loss to visualize this I use the pie chart. From the above dashboard I found out that superstore generate the highest purchase value in other word superstore generate the highest average transaction amount.

This page provides a detailed customer segmentation view, which is the most critical part of the dashboard.
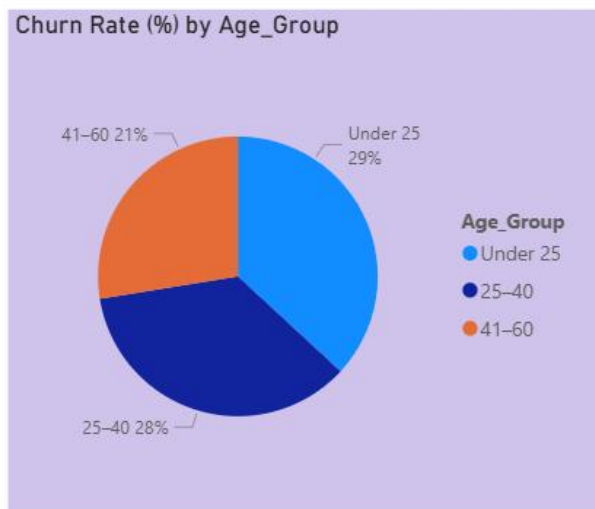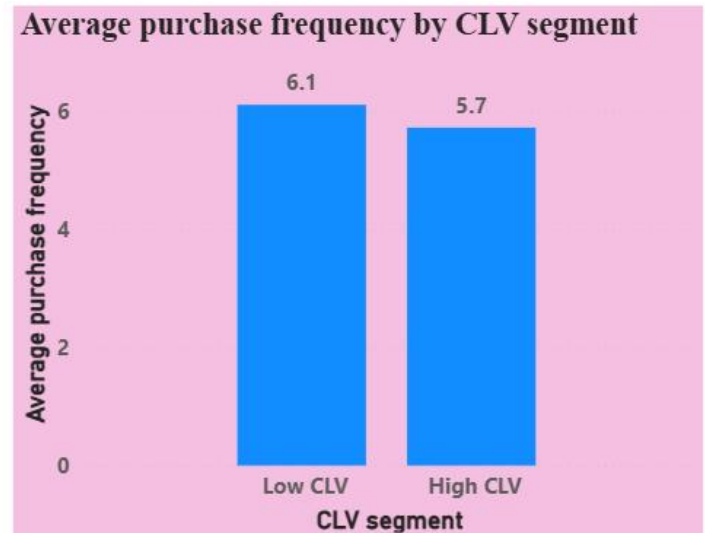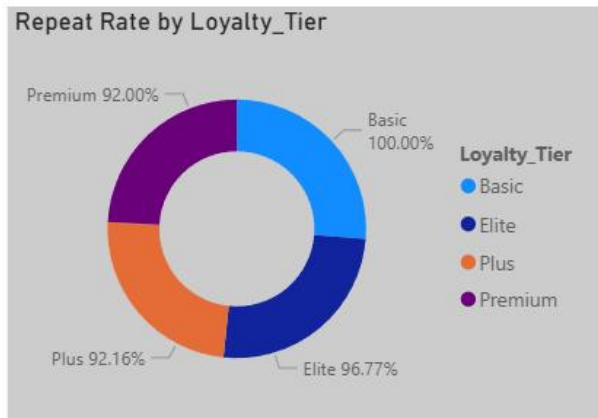
Repeat rate by loyalty tier visual shows that which loyalty customer type are repeated in nature. The average frequency by CLV segment show that which segment customer purchase more product by their CLV and the last chart Churn rate by age group shows which age group of customer are highly stop purchasing by analyzing their churn rate.

Moving to wards next task this task is basically about to insert the slicer in all the pages of dashboard, to allow interactive analysis, all the slicers were added and synchronized across all dashboard pages the slicer are:

· Region
· Preferred Channel
· Income Level
· Loyalty Tier

For Top 3 Recommendation

1. Insights from the CLV vs Days Since Last Purchase analysis show that a small group of customers contributes significantly higher value. Retaining these customers will have a greater impact on revenue than focusing on low-value segments.

2. Improve customer experience and engagement in high-churn store types through better service training, localized promotions, and channel-specific retention strategies.

3. Lower loyalty tiers show reduced engagement and lower redemption of loyalty points to increase more loyalty Simplify redemption processes, improve communication around loyalty benefits, and introduce targeted campaigns to encourage point usage and tier upgrades.

Video link=https://www.loom.com/share/125b90240c86409ba40e784b74398da5