Name : SURYA V

Contact Number : 7200345111

Mail ID : v.surya627@gmail.com

Forage Quantium Data Analytics Task 1 : Data Preparation and Customer Analytics

1. Importing the necessary dependencies

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import plotly as plt
import plotly.graph_objects as go
import plotly.express as px
import seaborn as sns
from IPython.display import IFrame, display
```

2. Reading the datasets using the pandas module

In [2]:
```
pur_beh = pd.read_csv('QVI_purchase_behaviour.csv')
tran = pd.read_excel('QVI_transaction_data.xlsx')
```

In [3]:
```
pur_beh.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 72637 entries, 0 to 72636
Data columns (total 3 columns):
 #   Column            Non-Null Count  Dtype 
---  ------            --------------  ----- 
 0   LYLTY_CARD_NBR    72637 non-null  int64 
 1   LIFESTAGE         72637 non-null  object
 2   PREMIUM_CUSTOMER  72637 non-null  object
dtypes: int64(1), object(2)
memory usage: 1.7+ MB
```

In [4]:
```
tran.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 264836 entries, 0 to 264835
Data columns (total 8 columns):
 #   Column          Non-Null Count   Dtype 
---  ------          --------------   ----- 
 0   DATE            264836 non-null  int64 
 1   STORE_NBR       264836 non-null  int64 
 2   LYLTY_CARD_NBR  264836 non-null  int64 
 3   TXN_ID          264836 non-null  int64 
 4   PROD_NBR        264836 non-null  int64 
 5   PROD_NAME       264836 non-null  object
```

```
 6   PROD_QTY        264836 non-null  int64
 7   TOT_SALES       264836 non-null  float64
dtypes: float64(1), int64(6), object(1)
memory usage: 16.2+ MB
```

From above we can infer that there are no Blank/NULL VALUES in both the datasets

3. Exploring the Purchase Behavior Dataset

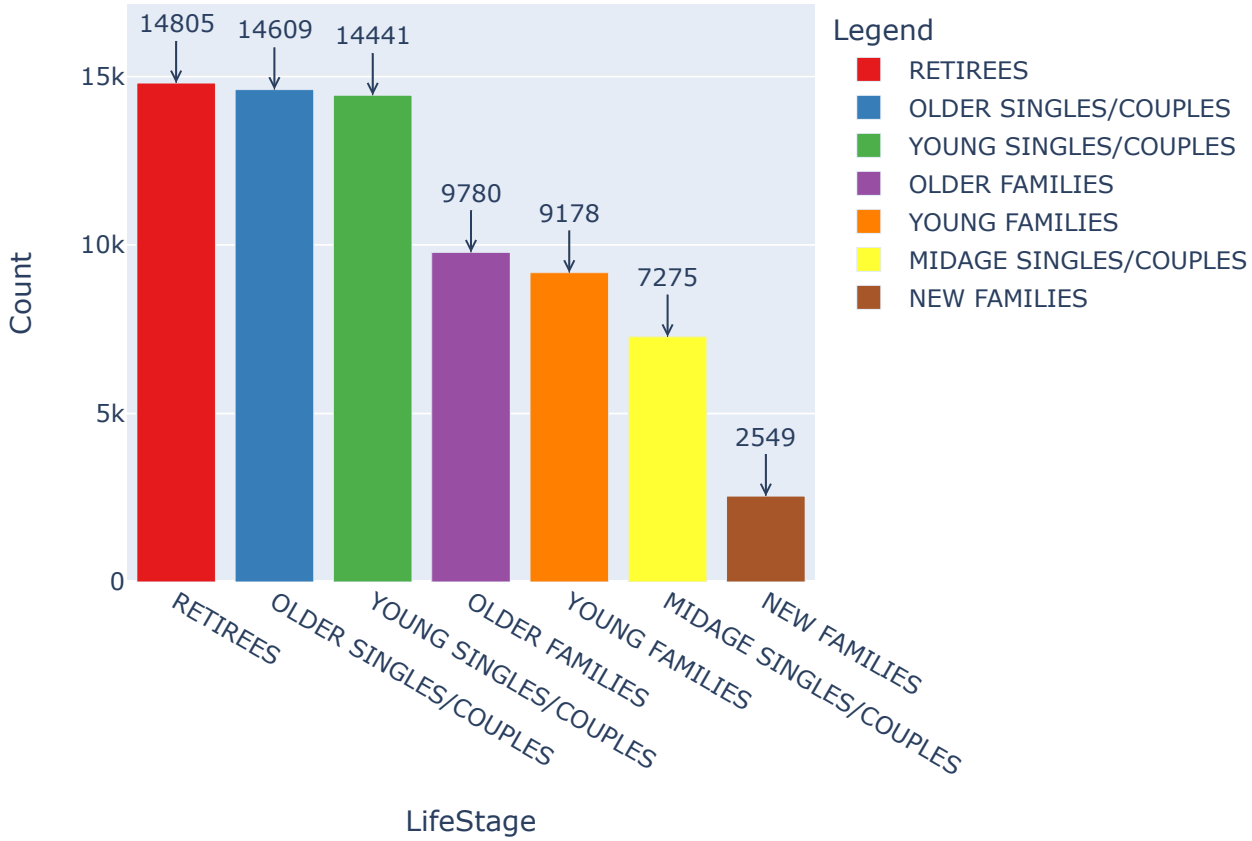
In [5]:
```
pur_beh.LIFESTAGE.value_counts()
```

Out[5]:
```
RETIREES                  14805
OLDER SINGLES/COUPLES     14609
YOUNG SINGLES/COUPLES     14441
OLDER FAMILIES             9780
YOUNG FAMILIES             9178
MIDAGE SINGLES/COUPLES     7275
NEW FAMILIES               2549
Name: LIFESTAGE, dtype: int64
```

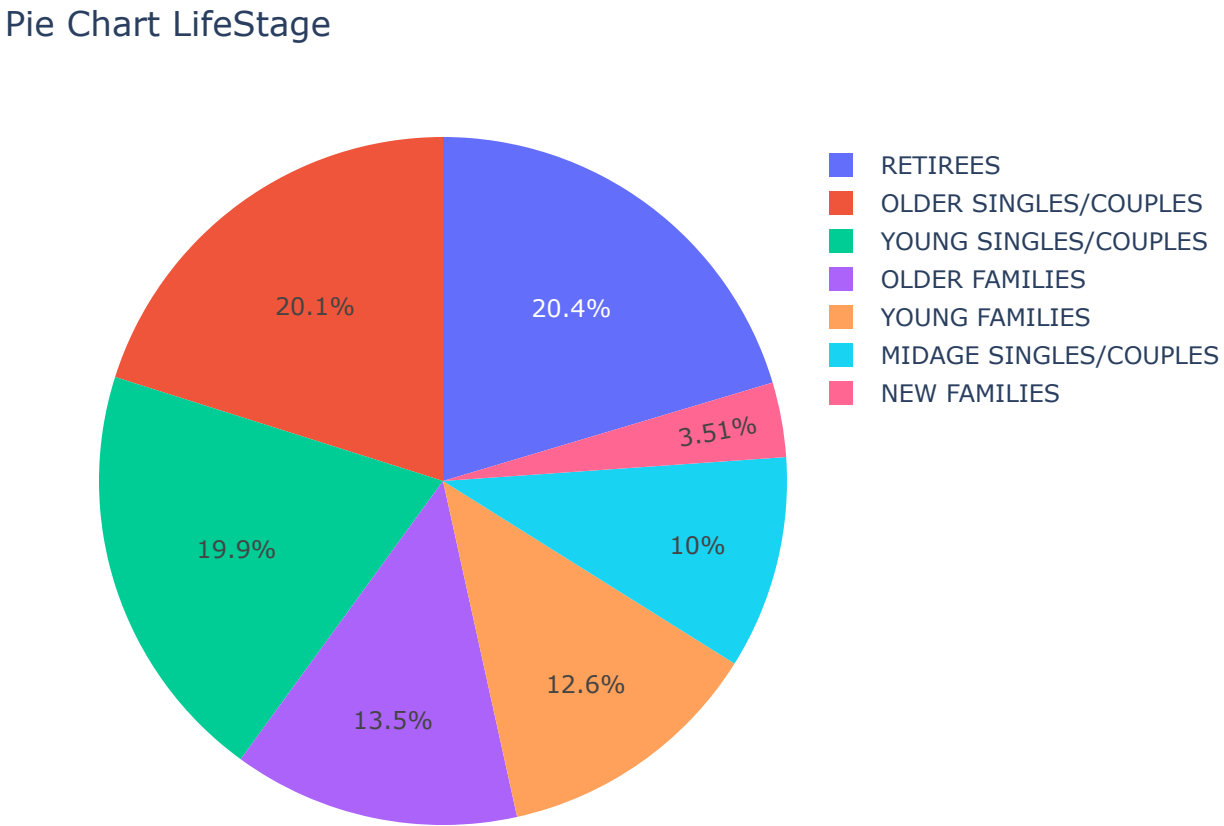
In [6]:
```
pur_beh.PREMIUM_CUSTOMER.value_counts()
```

Out[6]:
```
Mainstream    29245
Budget        24470
Premium       18922
Name: PREMIUM_CUSTOMER, dtype: int64
```

In [7]:
```
lifestage_type_counts = pur_beh['LIFESTAGE'].value_counts()

# Define custom colors for each lifestage type
colors = px.colors.qualitative.Set1[:len(lifestage_type_counts)]

# Create a bar chart using Plotly Express with different colors
fig = px.bar(
    x=lifestage_type_counts.index,
    y=lifestage_type_counts.values,
    labels={'y': 'Count', 'x': 'LifeStage'},
    color=lifestage_type_counts.index,  # Use lifestage type as color
    color_discrete_map={ctype: color for ctype, color in zip(lifestage_type_counts.index
    title='Lifestage Type Distribution',
)
for i, count in enumerate(lifestage_type_counts.values):
    fig.add_annotation(
        x=lifestage_type_counts.index[i],
        y=count,
        text=str(count),
        showarrow=True,
        arrowhead=5,
        ax=0,
        ay=-30,
    )

# Add a legend
fig.update_layout(legend=dict(title=dict(text='Legend')))

# Show the plot
fig.show()
```



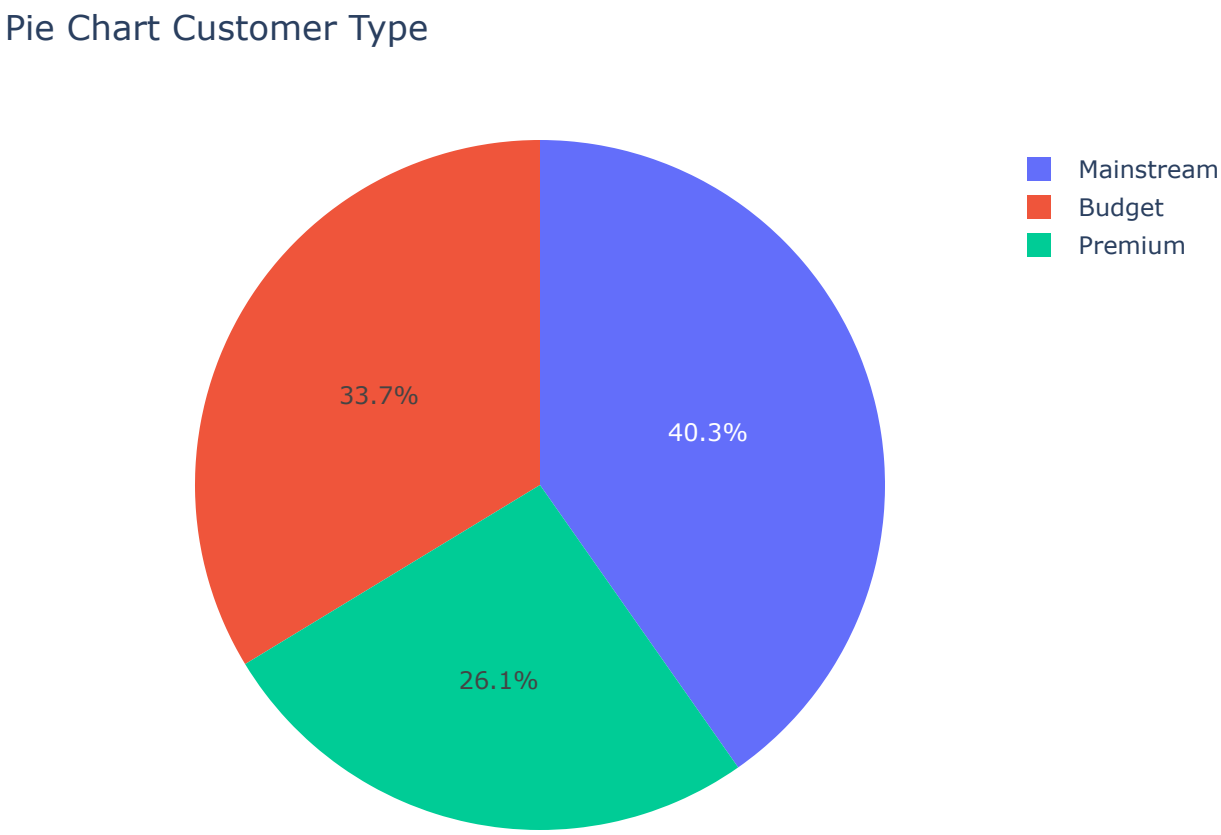
In [8]:
```
labels = pur_beh['LIFESTAGE'].value_counts().index
values = pur_beh['LIFESTAGE'].value_counts().values
fig = go.Figure(data=[go.Pie(labels=labels, values=values)])

# Set layout properties
fig.update_layout(title='Pie Chart LifeStage')

# Show the plot
fig.show()
```



In [9]:
```
premium_type_counts = pur_beh['PREMIUM_CUSTOMER'].value_counts()

# Define custom colors for each premium type
colors = px.colors.qualitative.Set1[:len(premium_type_counts)]

# Create a bar chart using Plotly Express with different colors
fig = px.bar(
    x=premium_type_counts.index,
    y=premium_type_counts.values,
    labels={'y': 'Count', 'x': 'Type of Customer'},
    color=premium_type_counts.index,  # Use premium type as color
    color_discrete_map={ctype: color for ctype, color in zip(premium_type_counts.index,
    title='Customer Type Distribution',
)
for i, count in enumerate(premium_type_counts.values):
    fig.add_annotation(
        x=premium_type_counts.index[i],
        y=count,
        text=str(count),
        showarrow=True,
        arrowhead=5,
        ax=0,
        ay=-30,
    )

# Add a legend
fig.update_layout(legend=dict(title=dict(text='Legend')))

# Show the plot
fig.show()
```

Type of Customer

In [10]:
```
labels = pur_beh['PREMIUM_CUSTOMER'].value_counts().index
values = pur_beh['PREMIUM_CUSTOMER'].value_counts().values
fig = go.Figure(data=[go.Pie(labels=labels, values=values)])

# Set layout properties
fig.update_layout(title='Pie Chart Customer Type')

# Show the plot
fig.show()
```



4. Exploring the Transactions Dataset

In [11]:
```
tran.describe()
```

Out[11]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_QTY	TOT_SALES
count	264836.000000	264836.00000	2.648360e+05	2.648360e+05	264836.000000	264836.000000	264836.000000
mean	43464.036260	135.08011	1.355495e+05	1.351583e+05	56.583157	1.907309	7.304200
std	105.389282	76.78418	8.057998e+04	7.813303e+04	32.826638	0.643654	3.083226
min	43282.000000	1.00000	1.000000e+03	1.000000e+00	1.000000	1.000000	1.500000
25%	43373.000000	70.00000	7.002100e+04	6.760150e+04	28.000000	2.000000	5.400000

50%	43464.000000	130.00000	1.303575e+05	1.351375e+05	56.000000	2.000000	7.400000
75%	43555.000000	203.00000	2.030942e+05	2.027012e+05	85.000000	2.000000	9.200000
max	43646.000000	272.00000	2.373711e+06	2.415841e+06	114.000000	200.000000	650.000000

In [12]:
```
tran
```

Out[12]:

	DATE	STORE_NBR	LYLTY_CARD_NBR	TXN_ID	PROD_NBR	PROD_NAME	PROD_QTY	TOT_SALES
0	43390	1	1000	1	5	Natural Chip Compny SeaSalt175g	2	6.0
1	43599	1	1307	348	66	CCs Nacho Cheese 175g	3	6.3
2	43605	1	1343	383	61	Smiths Crinkle Cut Chips Chicken 170g	2	2.9
3	43329	2	2373	974	69	Smiths Chip Thinly S/Cream&Onion 175g	5	15.0
4	43330	2	2426	1038	108	Kettle Tortilla ChpsHny&Jlpno Chili 150g	3	13.8
...	...	...	...	...	...	...	...	...
264831	43533	272	272319	270088	89	Kettle Sweet Chilli And Sour Cream 175g	2	10.8
264832	43325	272	272358	270154	74	Tostitos Splash Of Lime 175g	1	4.4
264833	43410	272	272379	270187	51	Doritos Mexicana 170g	2	8.8
264834	43461	272	272379	270188	42	Doritos Corn Chip Mexican Jalapeno 150g	2	7.8
264835	43365	272	272380	270189	74	Tostitos Splash Of Lime 175g	2	8.8

264836 rows × 8 columns

5. Combining both the datasets on basis of common column named 'LYLTY_CARD_NBR'

In [13]:
```
merged_data = pd.merge(pur_beh, tran, on='LYLTY_CARD_NBR', how='inner')
```

In [14]:
```
merged_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 264836 entries, 0 to 264835
Data columns (total 10 columns):
 #   Column            Non-Null Count   Dtype 
---  ------            --------------   ----- 
 0   LYLTY_CARD_NBR    264836 non-null  int64 
```

```
 1   LIFESTAGE         264836 non-null  object
 2   PREMIUM_CUSTOMER  264836 non-null  object
 3   DATE              264836 non-null  int64
 4   STORE_NBR         264836 non-null  int64
 5   TXN_ID            264836 non-null  int64
 6   PROD_NBR          264836 non-null  int64
 7   PROD_NAME         264836 non-null  object
 8   PROD_QTY          264836 non-null  int64
 9   TOT_SALES         264836 non-null  float64
dtypes: float64(1), int64(6), object(3)
memory usage: 22.2+ MB
```

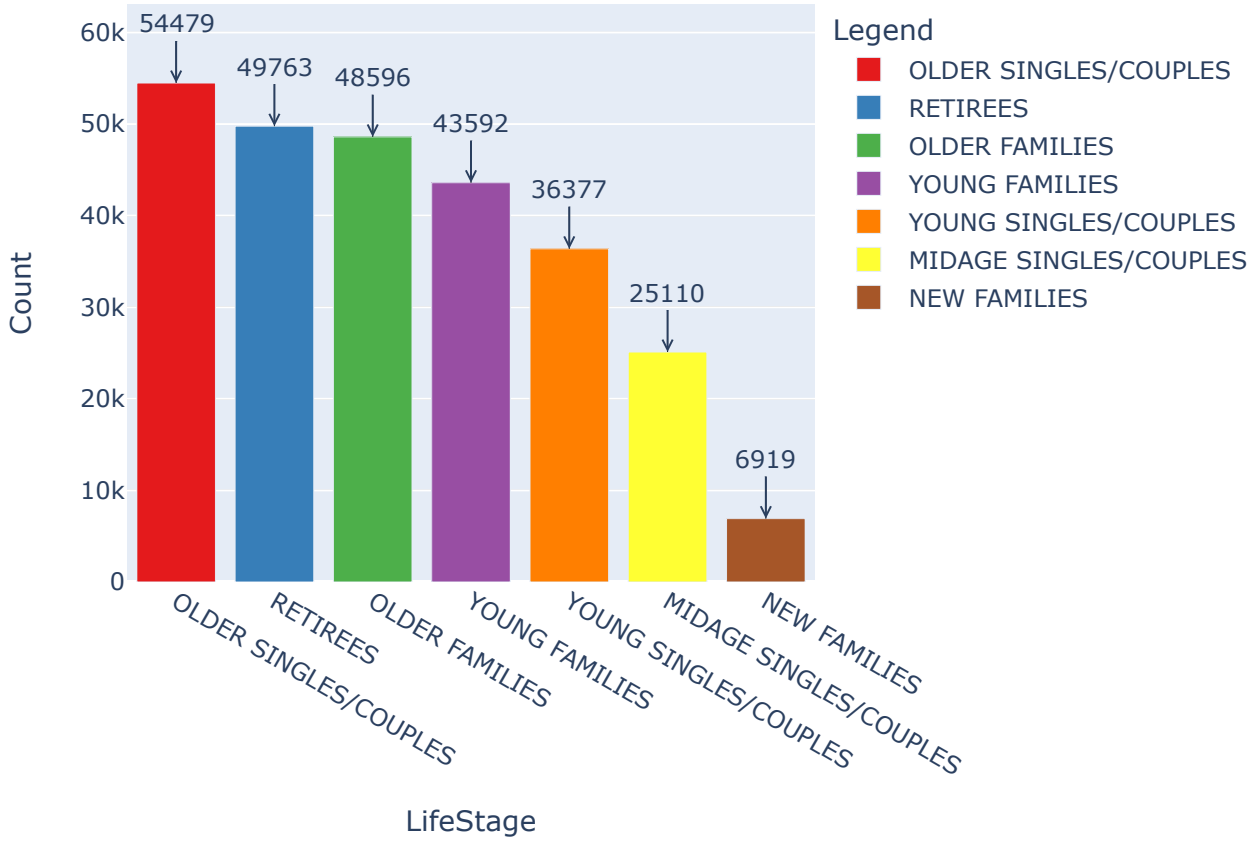
In [15]:
```
merged_data.LIFESTAGE.value_counts()
```

Out[15]:
```
OLDER SINGLES/COUPLES     54479
RETIREES                  49763
OLDER FAMILIES            48596
YOUNG FAMILIES            43592
YOUNG SINGLES/COUPLES     36377
MIDAGE SINGLES/COUPLES    25110
NEW FAMILIES               6919
Name: LIFESTAGE, dtype: int64
```

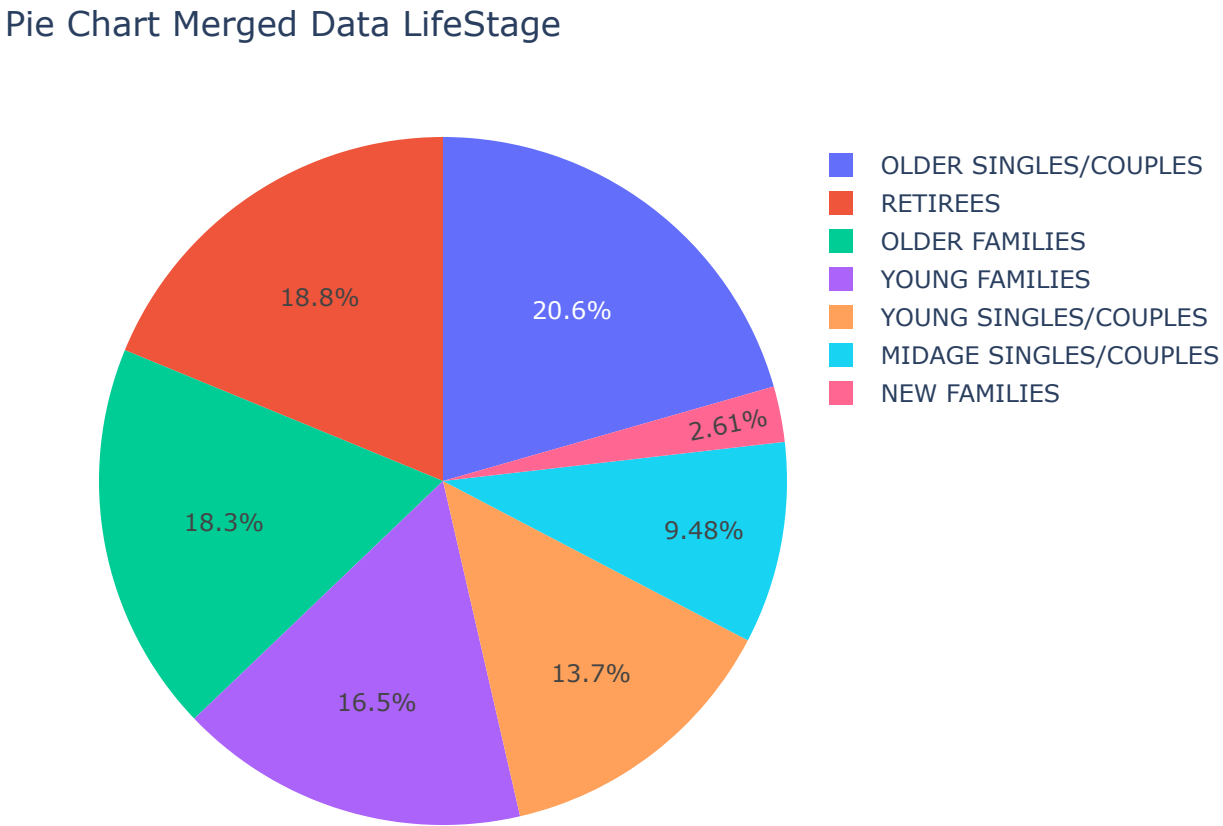
In [16]:
```
merged_data.PREMIUM_CUSTOMER.value_counts()
```

Out[16]:
```
Mainstream    101988
Budget         93157
Premium        69691
Name: PREMIUM_CUSTOMER, dtype: int64
```

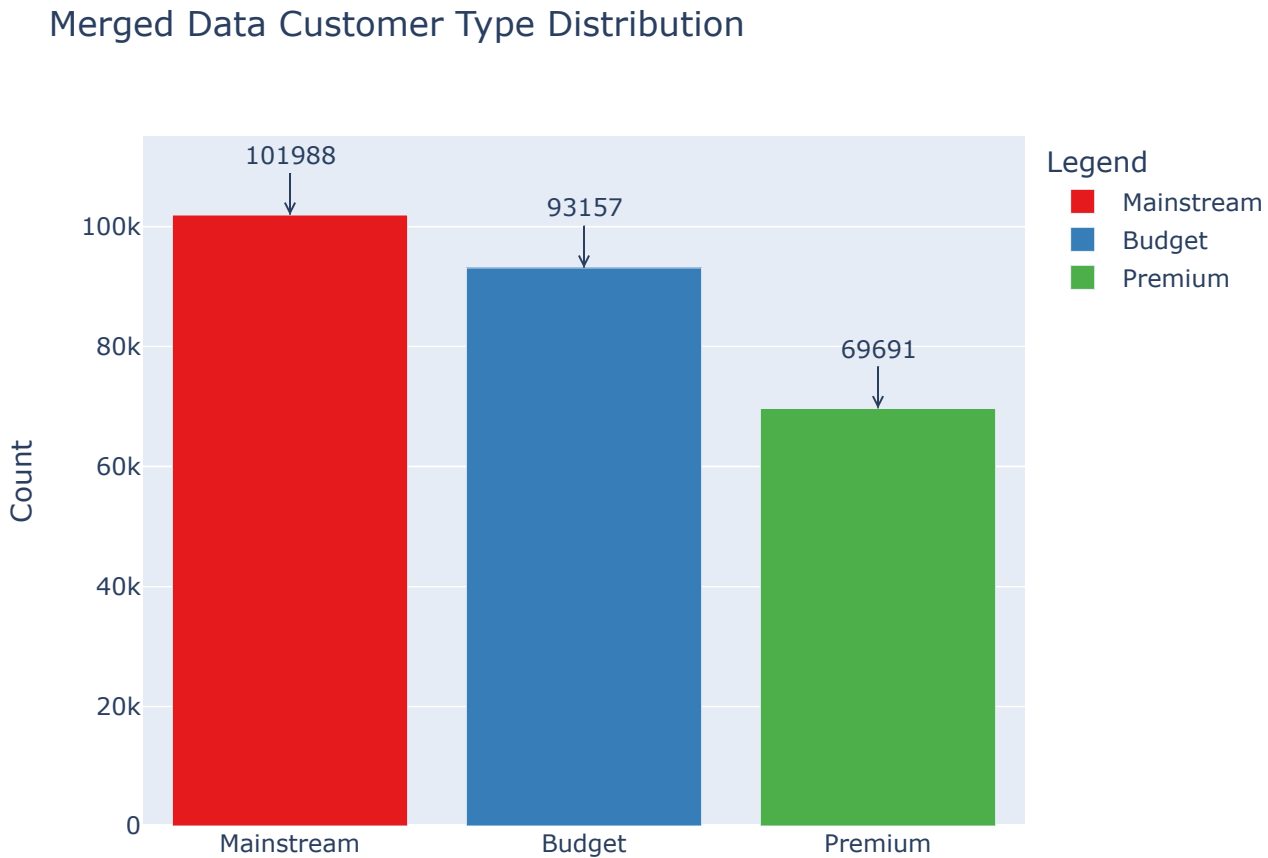
In [17]:
```
lifestage_type_counts = merged_data['LIFESTAGE'].value_counts()

# Define custom colors for each lifestage type
colors = px.colors.qualitative.Set1[:len(lifestage_type_counts)]

# Create a bar chart using Plotly Express with different colors
fig = px.bar(
    x=lifestage_type_counts.index,
    y=lifestage_type_counts.values,
    labels={'y': 'Count', 'x': 'LifeStage'},
    color=lifestage_type_counts.index,  # Use lifestage type as color
    color_discrete_map={ctype: color for ctype, color in zip(lifestage_type_counts.index
    title='Merged Data Lifestage Type Distribution',
)
for i, count in enumerate(lifestage_type_counts.values):
    fig.add_annotation(
        x=lifestage_type_counts.index[i],
        y=count,
        text=str(count),
        showarrow=True,
        arrowhead=5,
        ax=0,
        ay=-30,
    )

# Add a legend
fig.update_layout(legend=dict(title=dict(text='Legend')))

# Show the plot
fig.show()
```



In [18]:
```
labels = merged_data['LIFESTAGE'].value_counts().index
values = merged_data['LIFESTAGE'].value_counts().values
fig = go.Figure(data=[go.Pie(labels=labels, values=values)])

# Set layout properties
fig.update_layout(title='Pie Chart Merged Data LifeStage')

# Show the plot
fig.show()
```

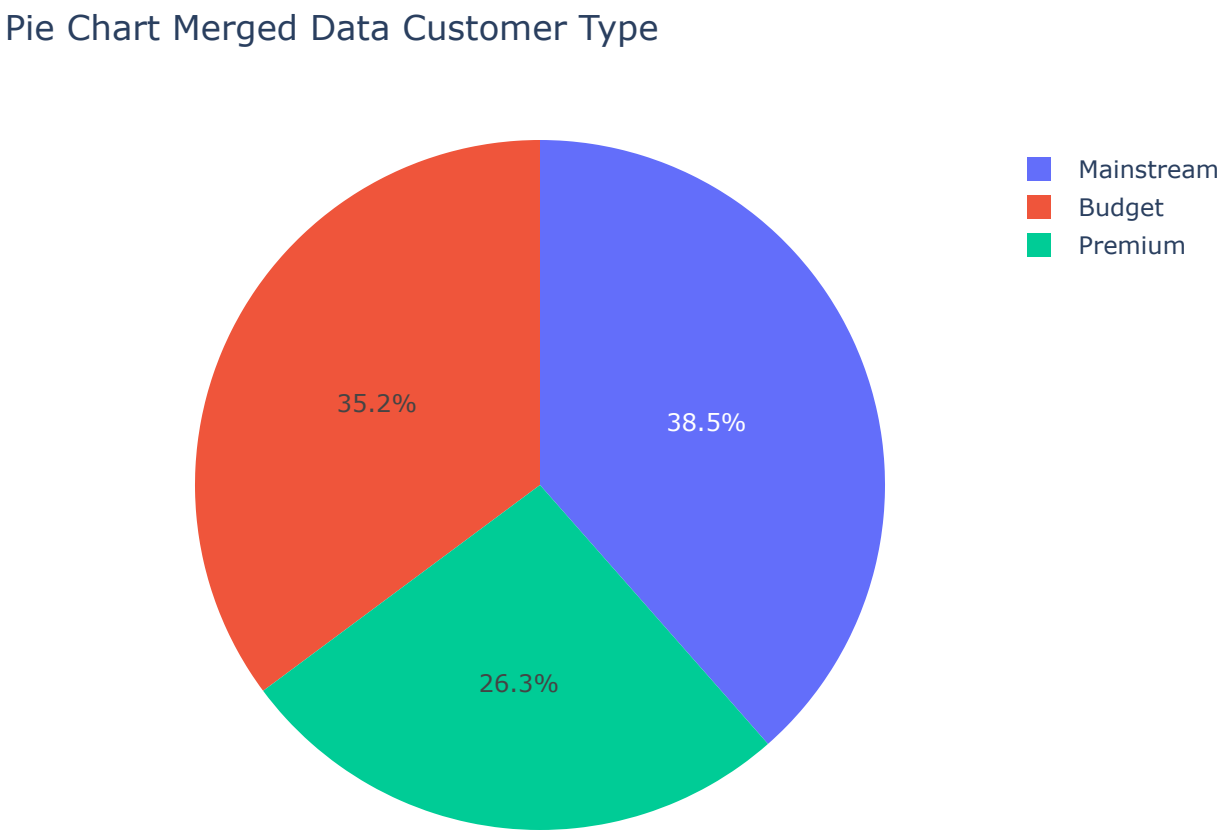


In [19]:
```
premium_type_counts = merged_data['PREMIUM_CUSTOMER'].value_counts()

# Define custom colors for each premium type
colors = px.colors.qualitative.Set1[:len(premium_type_counts)]

# Create a bar chart using Plotly Express with different colors
fig = px.bar(
    x=premium_type_counts.index,
    y=premium_type_counts.values,
    labels={'y': 'Count', 'x': 'Type of Customer'},
    color=premium_type_counts.index,  # Use premium type as color
    color_discrete_map={ctype: color for ctype, color in zip(premium_type_counts.index,
    title='Merged Data Customer Type Distribution',
)
for i, count in enumerate(premium_type_counts.values):
    fig.add_annotation(
        x=premium_type_counts.index[i],
        y=count,
        text=str(count),
        showarrow=True,
        arrowhead=5,
        ax=0,
        ay=-30,
    )

# Add a legend
fig.update_layout(legend=dict(title=dict(text='Legend')))

# Show the plot
fig.show()
```



Type of Customer

In [20]:
```
labels = merged_data['PREMIUM_CUSTOMER'].value_counts().index
values = merged_data['PREMIUM_CUSTOMER'].value_counts().values
fig = go.Figure(data=[go.Pie(labels=labels, values=values)])

# Set layout properties
fig.update_layout(title='Pie Chart Merged Data Customer Type')

# Show the plot
fig.show()
```



In [21]:
```
#Formating the DATE COLUMN from Microsoft Excel format to Normal Format
merged_data['DATE_NRML'] = pd.to_datetime(merged_data['DATE'], origin='1900-01-01', unit
```

In [22]:
```
#Extracting Year from DATE_NRML column
merged_data['Year'] = merged_data['DATE_NRML'].dt.year
```

In [23]:
```
#Extracting Month_name from DATE_NRML column
merged_data['Month_Name'] = merged_data['DATE_NRML'].dt.strftime('%B')
```

In [24]:
```
#Extracting Month_name and Year from DATE_NRML column
merged_data['Month_Year'] = merged_data['DATE_NRML'].dt.strftime('%B %Y')
```

In [25]:
```
#Extracting Week Number from DATE_NRML column
merged_data['Week_Number'] = merged_data['DATE_NRML'].dt.isocalendar().week
```

In [26]:
```
##Extracting Quater from DATE_NRML column
merged_data['Quarter'] = merged_data['DATE_NRML'].dt.quarter
```

In [27]:
```
#Extracting Quater and Year from DATE_NRML column
merged_data['Quarter_Year'] = merged_data['DATE_NRML'].dt.to_period('Q')
```

In [28]:
```
#Extracting WEEKDAY from DATE_NRML column
merged_data['Weekday'] = merged_data['DATE_NRML'].dt.day_name()
```

In [29]:
```
merged_data.head(10)
```

Out[29]:

	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER	DATE	STORE_NBR	TXN_ID	PROD_NBR	PRO
0	1000	YOUNG SINGLES/COUPLES	Premium	43390	1	1	5	Nat Sea
1	1002	YOUNG SINGLES/COUPLES	Mainstream	43359	1	2	58	Red Chikn&G
2	1003	YOUNG FAMILIES	Budget	43531	1	3	52	Grain Wa Crean
3	1003	YOUNG FAMILIES	Budget	43532	1	4	106	Natura Ch
4	1004	OLDER SINGLES/COUPLES	Mainstream	43406	1	5	96	WW Stack
5	1005	MIDAGE SINGLES/COUPLES	Mainstream	43462	1	6	86	Chee
6	1007	YOUNG SINGLES/COUPLES	Budget	43438	1	7	49	SourCrean Veg St
7	1007	YOUNG SINGLES/COUPLES	Budget	43439	1	8	10	RRD SR Pork B
8	1009	NEW FAMILIES	Premium	43424	1	9	20	Dorito Supre
9	1010	YOUNG SINGLES/COUPLES	Mainstream	43352	1	10	51	Doritos

In [30]:
```
merged_data.to_csv('Merged_data.csv')
#Saving the merged Dataset
```

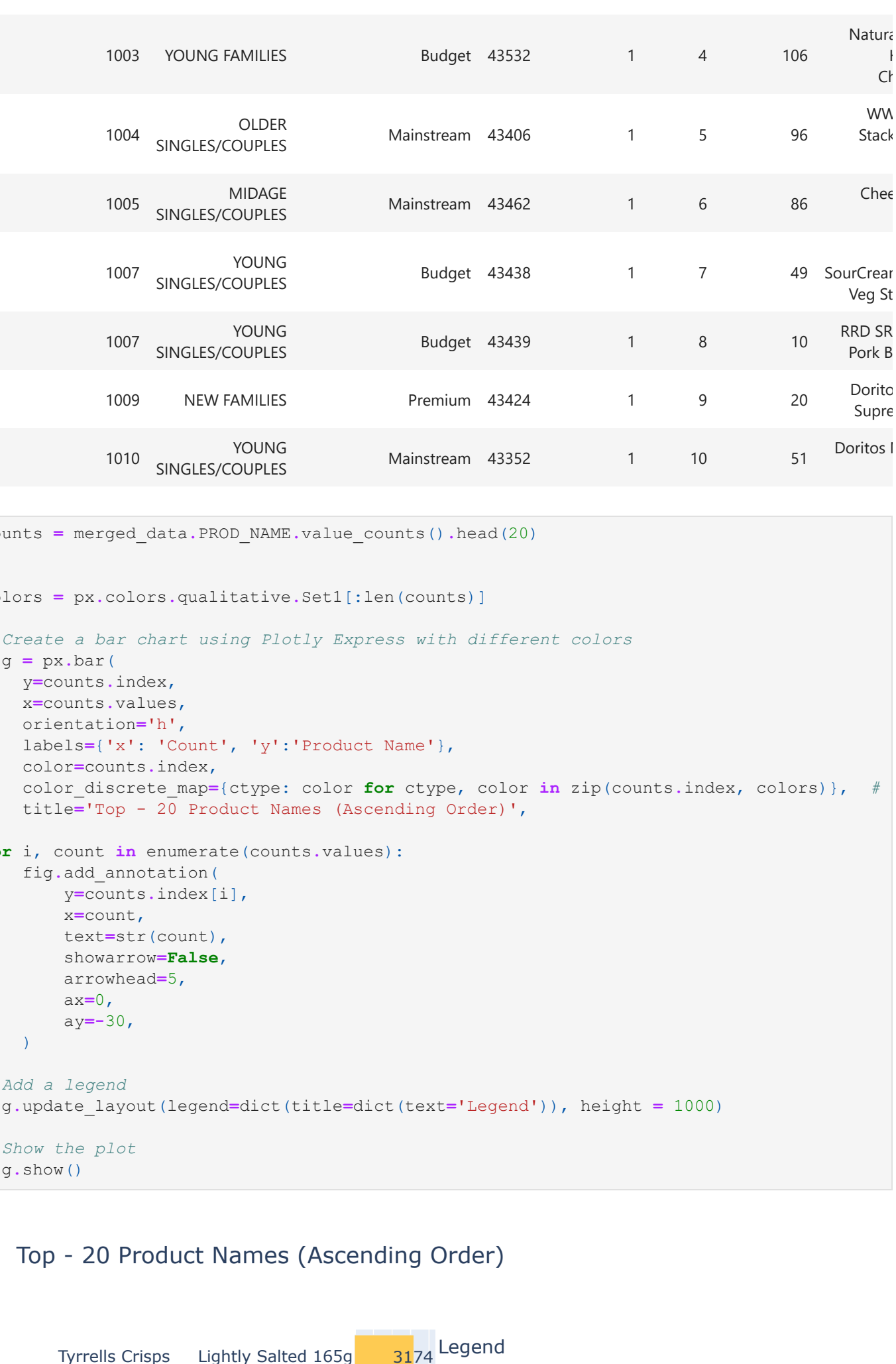
In [31]:
```
merged_data.head(10)
```

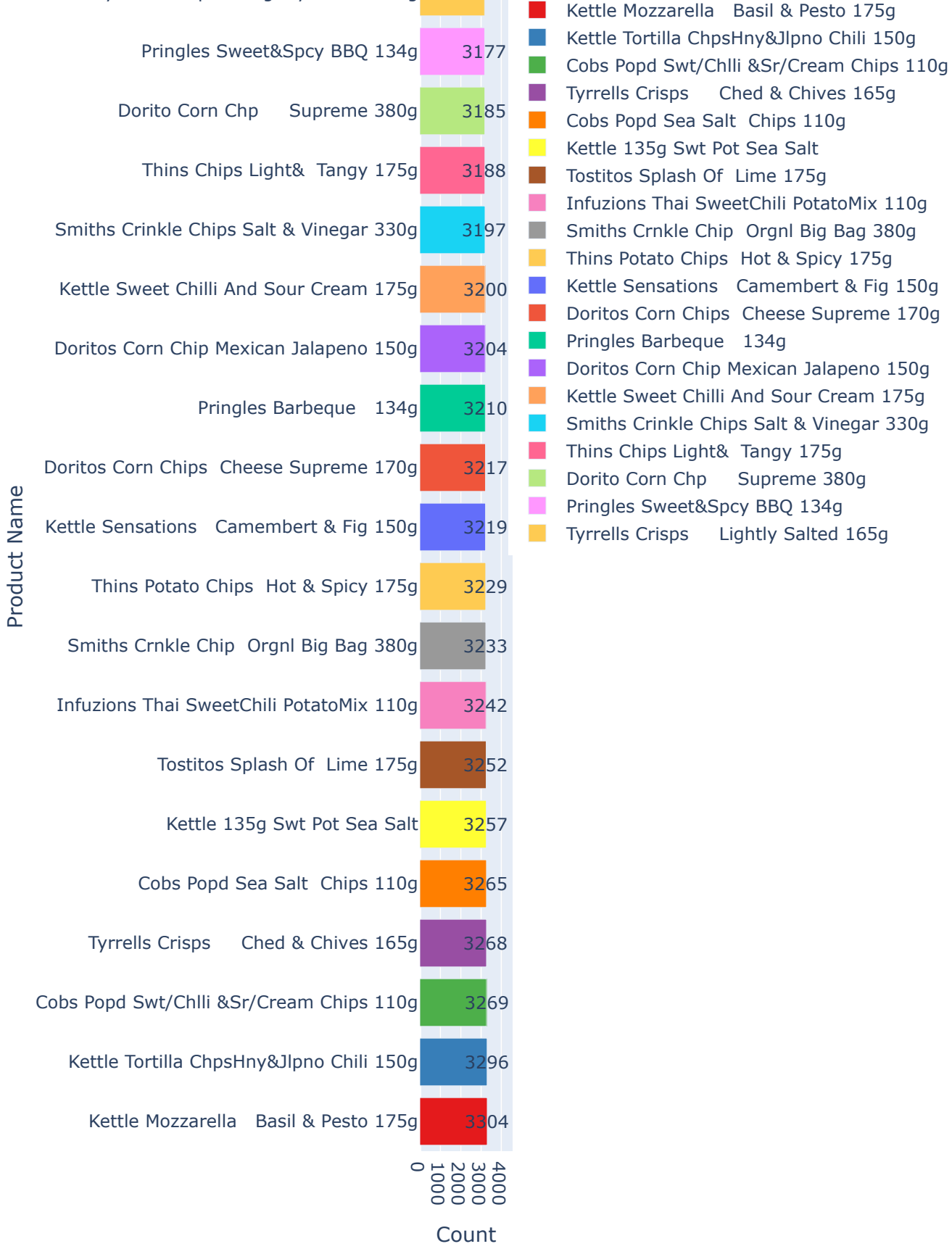
Out[31]:

	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER	DATE	STORE_NBR	TXN_ID	PROD_NBR	PRO
0	1000	YOUNG SINGLES/COUPLES	Premium	43390	1	1	5	Nat Sea
1	1002	YOUNG SINGLES/COUPLES	Mainstream	43359	1	2	58	Red Chikn&G
2	1003	YOUNG FAMILIES	Budget	43531	1	3	52	Grain Wa

3	1003	YOUNG FAMILIES	Budget	43532	1	4	106	Natura Ch
4	1004	OLDER SINGLES/COUPLES	Mainstream	43406	1	5	96	WW Stack
5	1005	MIDAGE SINGLES/COUPLES	Mainstream	43462	1	6	86	Chee
6	1007	YOUNG SINGLES/COUPLES	Budget	43438	1	7	49	SourCrear Veg St
7	1007	YOUNG SINGLES/COUPLES	Budget	43439	1	8	10	RRD SR Pork B
8	1009	NEW FAMILIES	Premium	43424	1	9	20	Dorito Supre
9	1010	YOUNG SINGLES/COUPLES	Mainstream	43352	1	10	51	Doritos

In [32]:
```
counts = merged_data.PROD_NAME.value_counts().head(20)


colors = px.colors.qualitative.Set1[:len(counts)]

# Create a bar chart using Plotly Express with different colors
fig = px.bar(
    y=counts.index,
    x=counts.values,
    orientation='h',
    labels={'x': 'Count', 'y':'Product Name'},
    color=counts.index,
    color_discrete_map={ctype: color for ctype, color in zip(counts.index, colors)},  #
    title='Top - 20 Product Names (Ascending Order)',
)
for i, count in enumerate(counts.values):
    fig.add_annotation(
        y=counts.index[i],
        x=count,
        text=str(count),
        showarrow=False,
        arrowhead=5,
        ax=0,
        ay=-30,
    )

# Add a legend
fig.update_layout(legend=dict(title=dict(text='Legend')), height = 1000)

# Show the plot
fig.show()
```

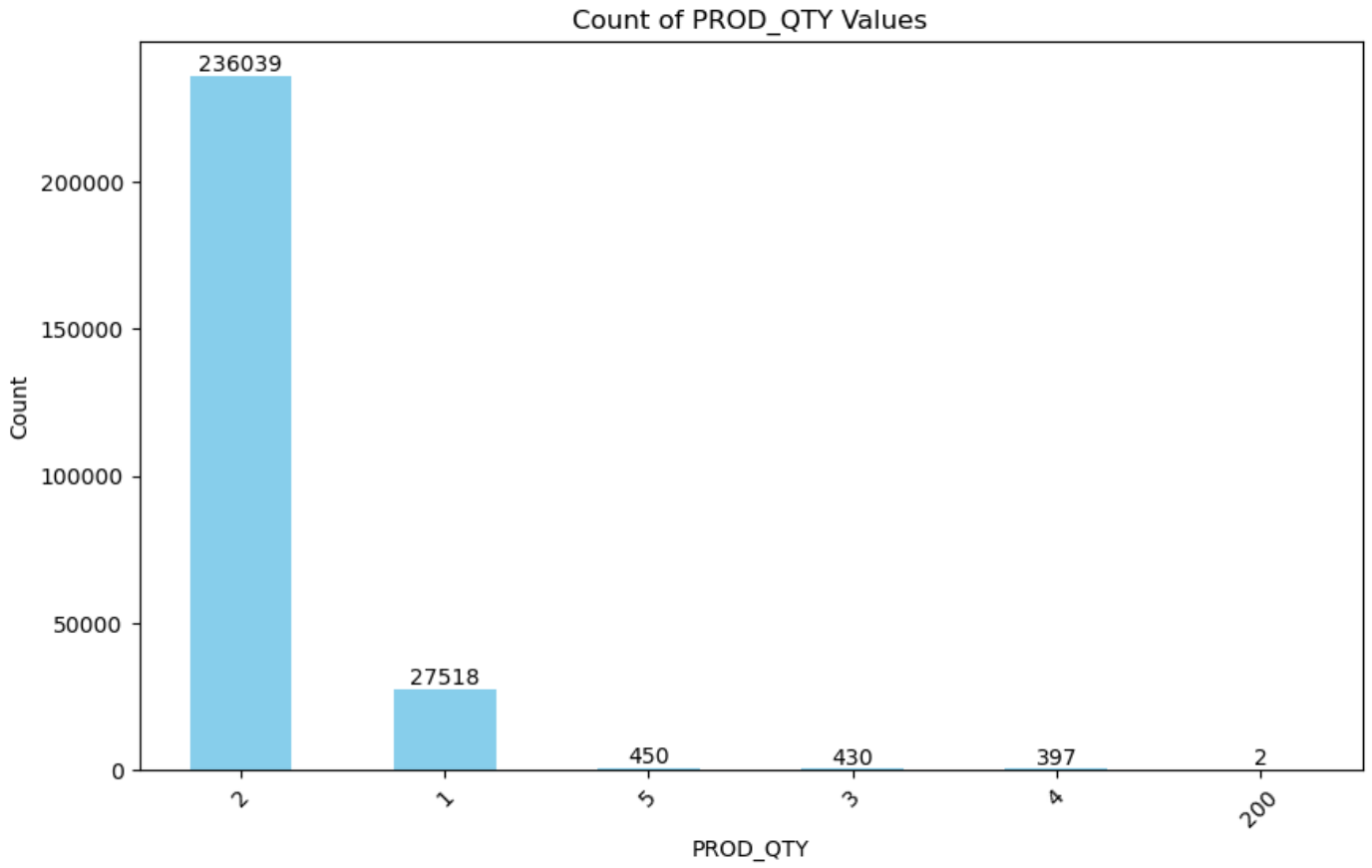




In [33]:
```
merged_data.PROD_QTY.value_counts()
```

Out[33]:
```
2      236039
1       27518
5         450
3         430
4         397
200         2
Name: PROD_QTY, dtype: int64
```

In [34]:
```
import matplotlib.pyplot as plt
prod_qty_counts = merged_data['PROD_QTY'].value_counts()

# Plotting the counts
plt.figure(figsize=(10, 6))
ax = prod_qty_counts.plot(kind='bar', color='skyblue')
plt.title('Count of PROD_QTY Values')
plt.xlabel('PROD_QTY')
plt.ylabel('Count')
plt.xticks(rotation=45)
for i, count in enumerate(prod_qty_counts):
    ax.text(i, count + 0.1, str(count), ha='center', va='bottom')


# Display the plot
plt.show()
```



In [35]:
```
merged_data.head(5)
```

Out[35]:

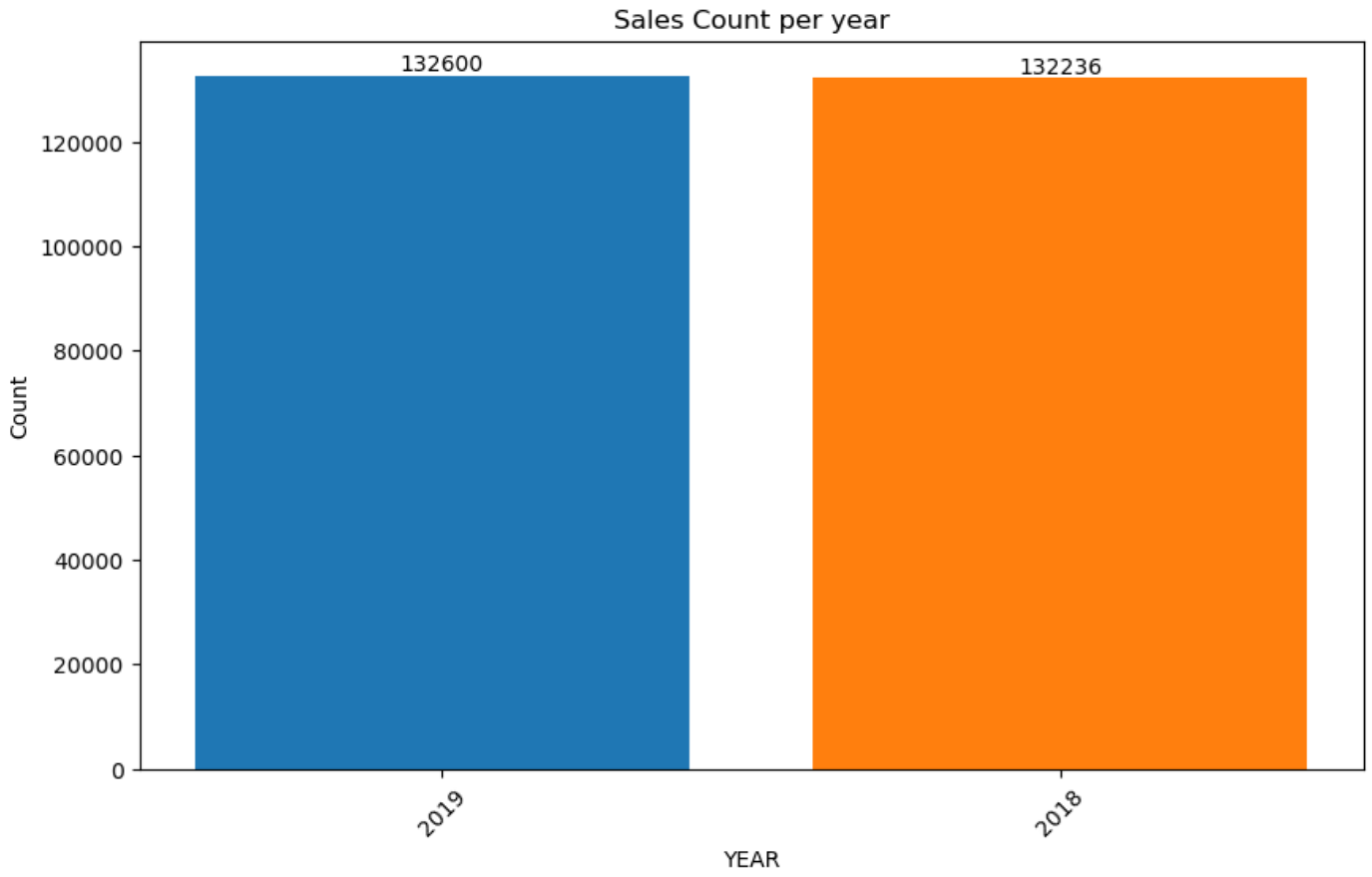
	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER	DATE	STORE_NBR	TXN_ID	PROD_NBR	PROD_N
0	1000	YOUNG SINGLES/COUPLES	Premium	43390	1	1	5	Natural Cor SeaSalt
1	1002	YOUNG SINGLES/COUPLES	Mainstream	43359	1	2	58	Red Rock Chikn&C Aioli
2	1003	YOUNG FAMILIES	Budget	43531	1	3	52	Grain W Cream&C
3	1003	YOUNG FAMILIES	Budget	43532	1	4	106	Na ChipCo Chckn

4	1004	OLDER SINGLES/COUPLES	Mainstream	43406	1	5	96	WW Ori Stacked

In [36]:
```
merged_data.Year.value_counts()
```

Out[36]:
```
2019    132600
2018    132236
Name: Year, dtype: int64
```

In [37]:
```
counts = merged_data['Year'].value_counts()

# Plotting the counts
plt.figure(figsize=(10, 6))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.title('Sales Count per year')
plt.xlabel('YEAR')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=45)

# Display the plot
plt.show()
```

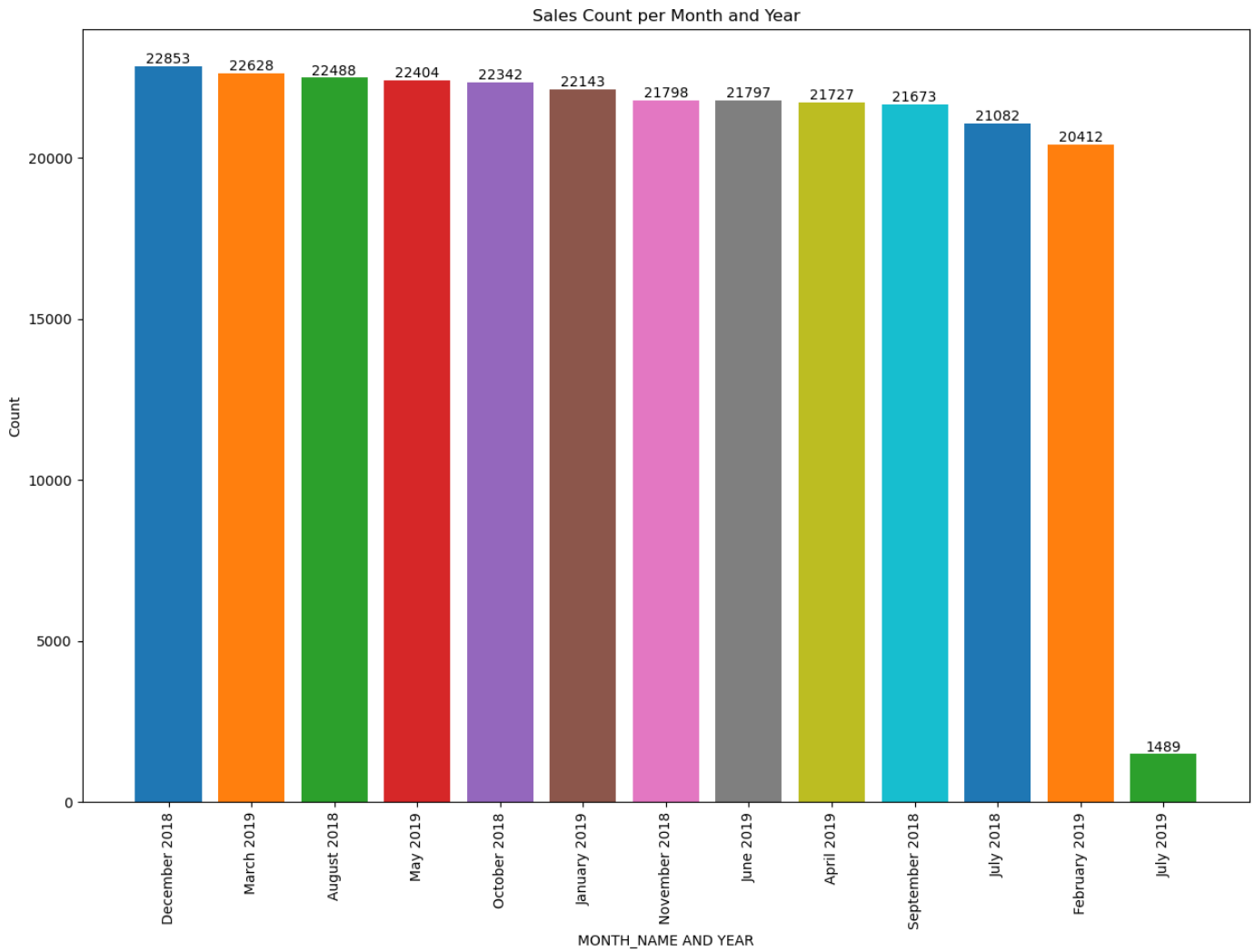


In [38]:
```
merged_data.Month_Year.value_counts()
```

Out[38]:
```
December 2018     22853
March 2019        22628
August 2018       22488
May 2019          22404
October 2018      22342
January 2019      22143
```

```
November 2018     21798
June 2019         21797
April 2019        21727
September 2018    21673
July 2018         21082
February 2019     20412
July 2019          1489
Name: Month_Year, dtype: int64
```

In [39]:
```
counts = merged_data['Month_Year'].value_counts()

# Plotting the counts
plt.figure(figsize=(15, 10))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.title('Sales Count per Month and Year')
plt.xlabel('MONTH_NAME AND YEAR')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=90)

# Display the plot
plt.show()
```

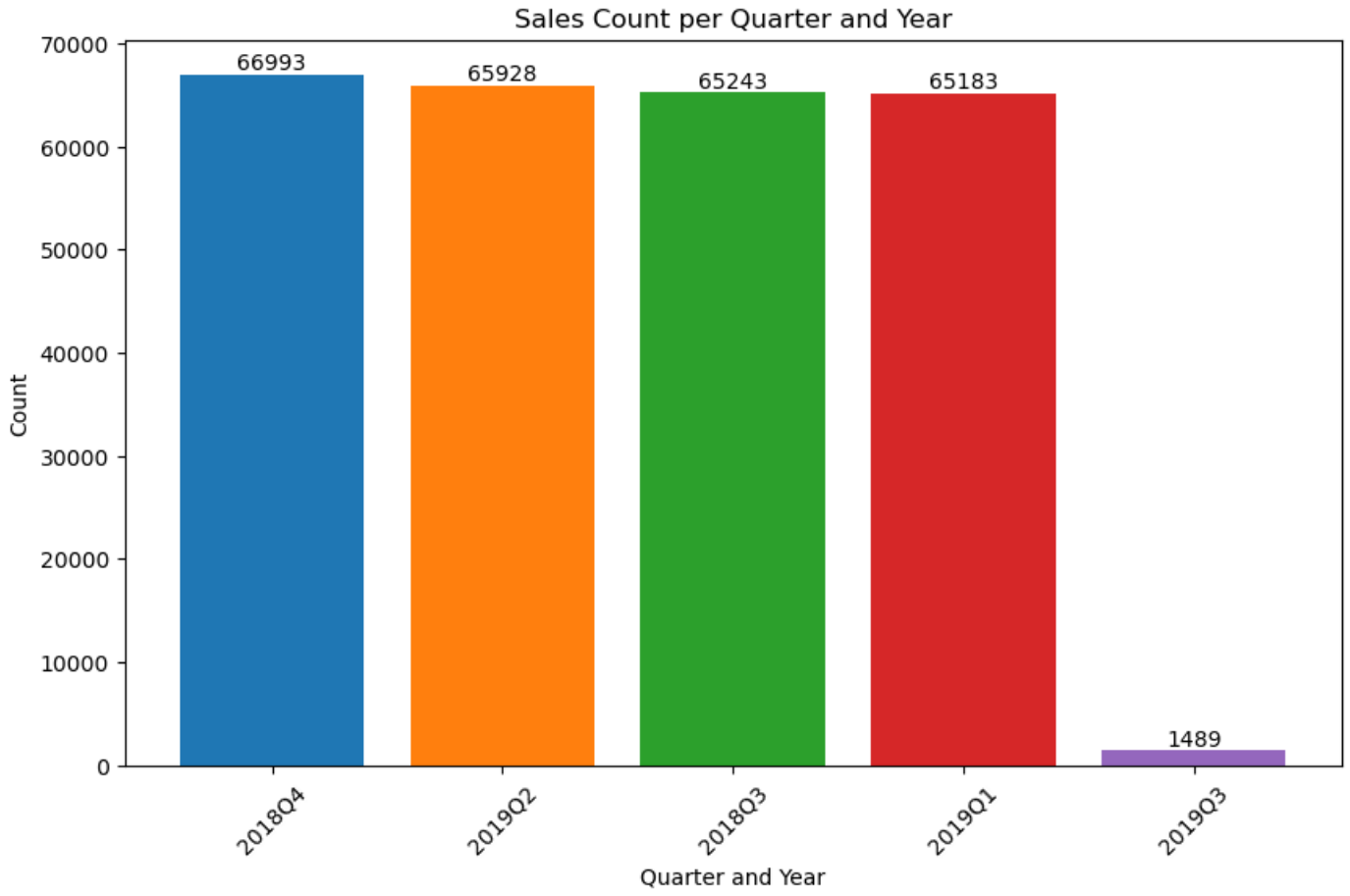


In [40]:
```
merged_data['Quarter_Year'].value_counts()
```

Out[40]:
```
2018Q4    66993
2019Q2    65928
2018Q3    65243
2019Q1    65183
```

```
2019Q3     1489
Freq: Q-DEC, Name: Quarter_Year, dtype: int64
```

In [41]:
```
counts = merged_data['Quarter_Year'].value_counts()

# Plotting the counts
plt.figure(figsize=(10, 6))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.title('Sales Count per Quarter and Year')
plt.xlabel('Quarter and Year')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=45)

# Display the plot
plt.show()
```

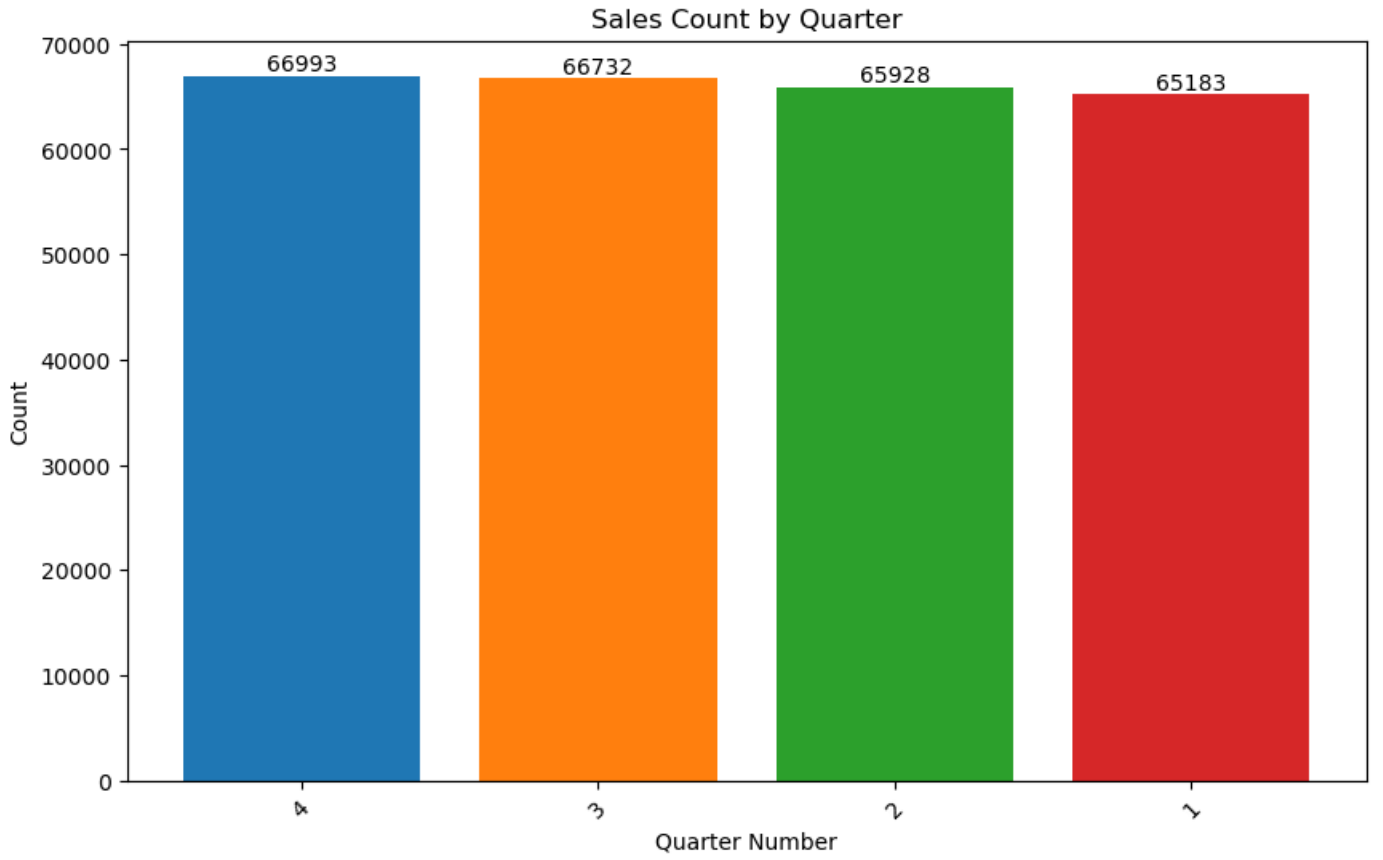


In [42]:
```
merged_data['Quarter'].value_counts()
```

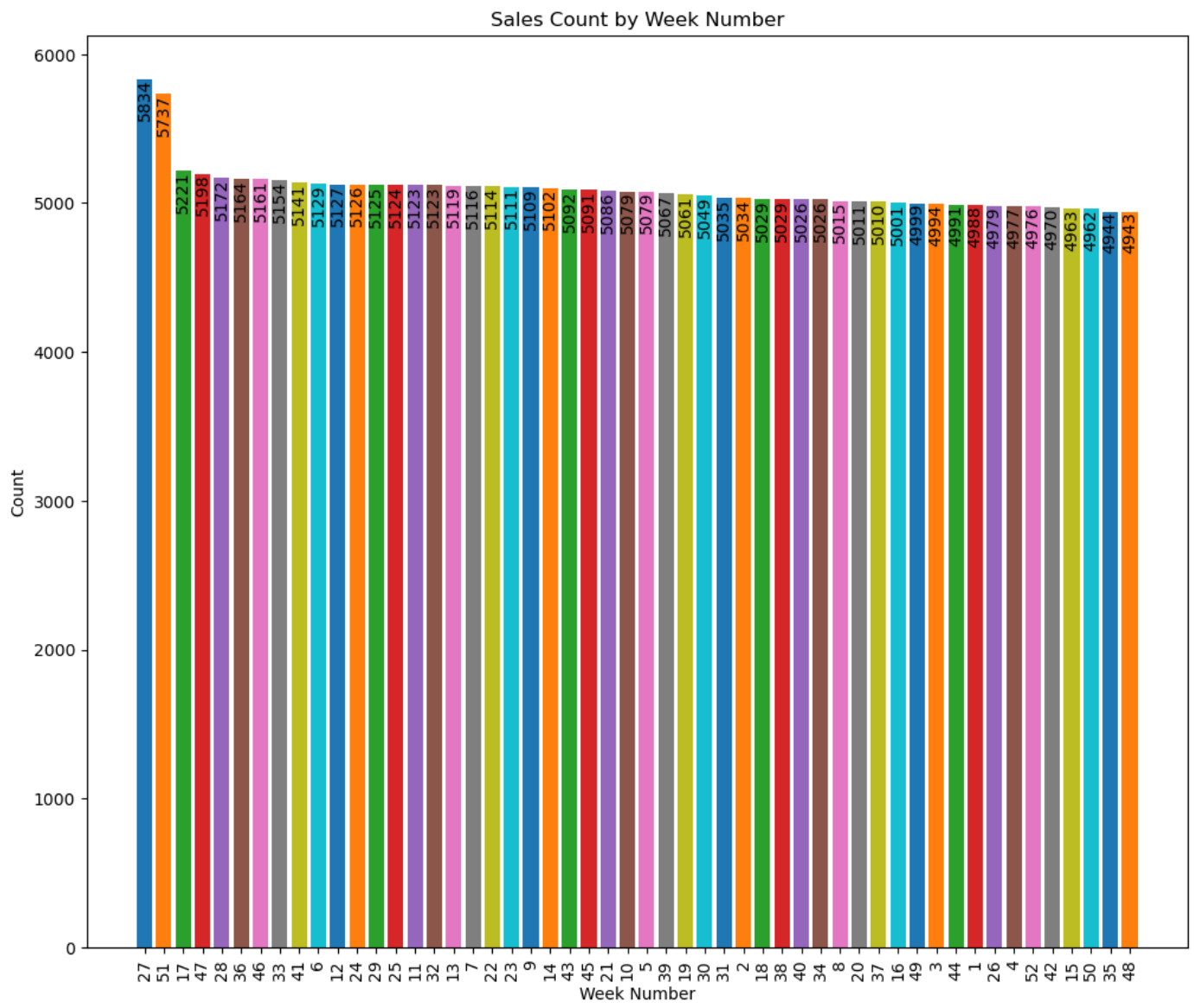
Out[42]:
```
4    66993
3    66732
2    65928
1    65183
Name: Quarter, dtype: int64
```

In [43]:
```
counts = merged_data['Quarter'].value_counts()

# Plotting the counts
plt.figure(figsize=(10, 6))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')
```

```
plt.title('Sales Count by Quarter')
plt.xlabel('Quarter Number')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=45)

# Display the plot
plt.show()
```



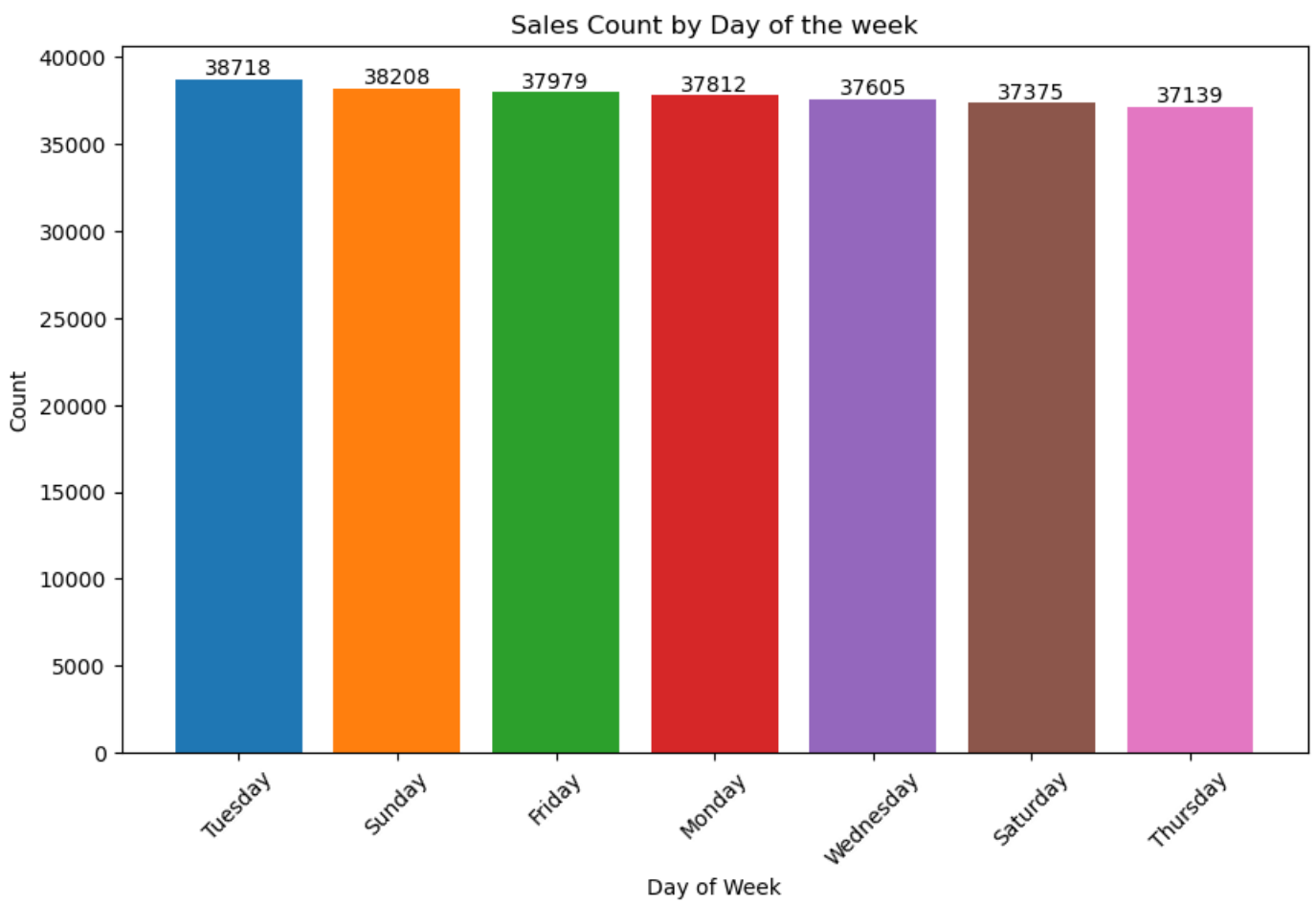
In [44]:
```
counts = merged_data['Week_Number'].value_counts()

# Plotting the counts
plt.figure(figsize=(12, 10))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='top', rotation = 90)

plt.title('Sales Count by Week Number')
plt.xlabel('Week Number')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=90)

# Display the plot
plt.show()
```



In [45]:
```
merged_data['Weekday'].value_counts()
```

Out[45]:
```
Tuesday      38718
Sunday       38208
Friday       37979
Monday       37812
Wednesday    37605
Saturday     37375
Thursday     37139
Name: Weekday, dtype: int64
```

In [46]:
```
counts = merged_data['Weekday'].value_counts()

# Plotting the counts
plt.figure(figsize=(10, 6))

for i, (value, count) in enumerate(counts.items()):
    plt.bar(i, count)
    plt.text(i, count + 0.1, str(count), ha='center', va='bottom')

plt.title('Sales Count by Day of the week')
plt.xlabel('Day of Week')
plt.ylabel('Count')
plt.xticks(range(len(counts)), counts.index, rotation=45)

# Display the plot
plt.show()
```

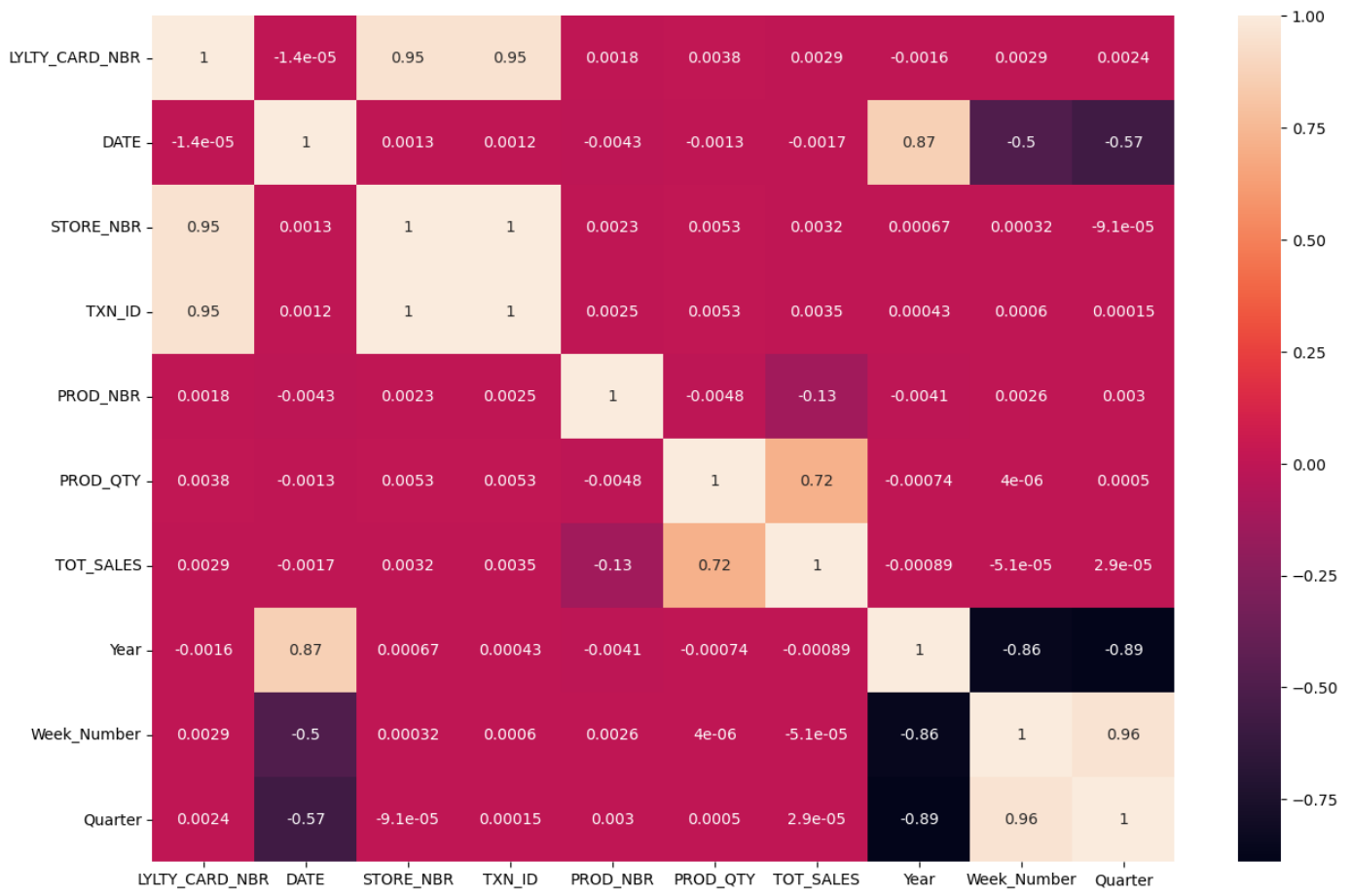


In [47]:
```
merged_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 264836 entries, 0 to 264835
Data columns (total 18 columns):
 #   Column            Non-Null Count   Dtype         
---  ------            --------------   -----         
 0   LYLTY_CARD_NBR    264836 non-null  int64         
 1   LIFESTAGE         264836 non-null  object        
 2   PREMIUM_CUSTOMER  264836 non-null  object        
 3   DATE              264836 non-null  int64         
 4   STORE_NBR         264836 non-null  int64         
 5   TXN_ID            264836 non-null  int64         
 6   PROD_NBR          264836 non-null  int64         
 7   PROD_NAME         264836 non-null  object        
 8   PROD_QTY          264836 non-null  int64         
 9   TOT_SALES         264836 non-null  float64       
 10  DATE_NRML         264836 non-null  datetime64[ns]
 11  Year              264836 non-null  int64         
 12  Month_Name        264836 non-null  object        
 13  Month_Year        264836 non-null  object        
 14  Week_Number       264836 non-null  UInt32        
 15  Quarter           264836 non-null  int64         
 16  Quarter_Year      264836 non-null  period[Q-DEC] 
 17  Weekday           264836 non-null  object        
dtypes: UInt32(1), datetime64[ns](1), float64(1), int64(8), object(6), period[Q-DEC](1)
memory usage: 37.6+ MB
```

In [48]:
```
plt.figure(figsize=(15, 10))
sns.heatmap(merged_data.corr(), annot=True)
```

Out[48]:
```
<AxesSubplot:>
```



In [49]:
```
merged_data.head()
```

Out[49]:

	LYLTY_CARD_NBR	LIFESTAGE	PREMIUM_CUSTOMER	DATE	STORE_NBR	TXN_ID	PROD_NBR	PROD_N
0	1000	YOUNG SINGLES/COUPLES	Premium	43390	1	1	5	Natural Cor SeaSalt
1	1002	YOUNG SINGLES/COUPLES	Mainstream	43359	1	2	58	Red Rock Chikn&(Aioli
2	1003	YOUNG FAMILIES	Budget	43531	1	3	52	Grain W Cream&C
3	1003	YOUNG FAMILIES	Budget	43532	1	4	106	Na ChipCo Chckn
4	1004	OLDER SINGLES/COUPLES	Mainstream	43406	1	5	96	WW Ori Stacked (

In [ ]: