Bazaar Internship Case Study

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jupyter Bazaar_Izza_Farhat Last Checkpoint: 1 hour ago

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Code JupyterLab Python [conda env:base] *

[42]:
```
import pandas as pd
df = pd.read_csv('Data Analytics Internship Dataset - Bazaar .csv')
df.head()
```

[42]:

	signup_date	signup_month	store_id	acquisition_platform	first_order_date
0	2024-11-06	2024-11-01	6bgMF1zsCjjwAVSSHdY7Ob	Google	NaN
1	2024-11-16	2024-11-01	6FODsNRWURZA0ilDs8FZQu	Google	NaN
2	2024-11-01	2024-11-01	6ySwyyHo39qXTjlCMT2VLi	Facebook	NaN
3	2024-11-28	2024-11-01	S7E0LsjLwGtnOD075bNoM	Google	2024-11-28
4	2024-11-19	2024-11-01	24Z8UNZpVQWRnFZGPf5Flv	Facebook	NaN

[44]:
```
df.info()
df.isnull().sum()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11578 entries, 0 to 11577
Data columns (total 5 columns):
 #   Column                Non-Null Count  Dtype 
---  ------                --------------  ----- 
 0   signup_date           11578 non-null  object
 1   signup_month          11578 non-null  object
 2   store_id              11578 non-null  object
 3   acquisition_platform  11578 non-null  object
 4   first_order_date      3271 non-null   object
dtypes: object(5)
memory usage: 452.4+ KB
```

[44]:
```
signup_date                0
signup_month               0
store_id                   0
acquisition_platform       0
first_order_date        8307
dtype: int64
```

[46]:
```
df['signup_date'] = pd.to_datetime(df['signup_date'], errors='coerce')
df['first_order_date'] = pd.to_datetime(df['first_order_date'], errors='coerce')
df.dtypes
```

[46]:
```
signup_date            datetime64[ns]
signup_month                   object
store_id                       object
acquisition_platform           object
first_order_date       datetime64[ns]
```

User Behavior Analysis - Conversion Rate

Code:

The code calculates the total number of users, the number of users who placed at least one order, and the conversion rate.

It uses the `len()` function to count total users and `notnull().sum()` to count converted users.

The conversion rate is calculated as the percentage of users who placed an order.

Output:

Total users: 11578

Converted users: 3271

Conversion rate: 28.25%

Explanation: This provides a summary of user behavior, highlighting the conversion rate from signup to first order.

[48]:
```
total_users = len(df)
converted_users = df['first_order_date'].notnull().sum()

conversion_rate = converted_users / total_users * 100
print(f"Conversion Rate: {conversion_rate:.2f}%")
```

```
Conversion Rate: 28.25%
```

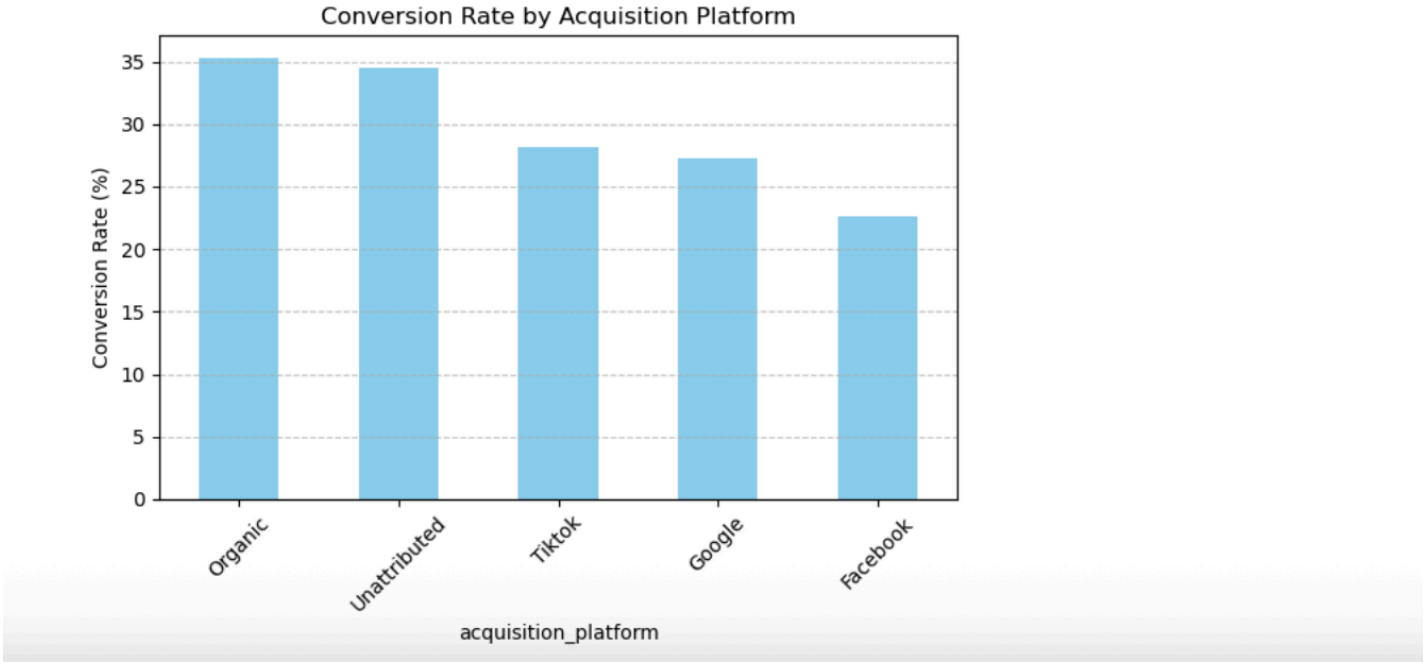
[50]:
```
platform_conversion = df.groupby('acquisition_platform')['first_order_date'].apply(lambda x: x.notnull().mean() * 100)
platform_conversion = platform_conversion.sort_values(ascending=False)

platform_conversion
```

[50]:
```
acquisition_platform
Organic         35.297655
Unattributed    34.541578
Tiktok          28.210117
Google          27.260126
Facebook        22.588832
Name: first_order_date, dtype: float64
```

[52]:
```
import matplotlib.pyplot as plt

platform_conversion.plot(kind='bar', color='skyblue')
plt.ylabel('Conversion Rate (%)')
plt.title('Conversion Rate by Acquisition Platform')
plt.xticks(rotation=45)
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.tight_layout()
plt.show()
```



Conversion Rate by Acquisition Platform

Code:

The code groups users by acquisition platform and calculates the conversion rate for each platform.

It sorts the platforms by conversion rate in descending order.

Output:

Conversion rates by platform:

Organic: 35.29%
Unattributed: 34.54%
Tiktok: 28.21%
Google: 27.26%
Facebook: 22.58%

Highest conversion rate: Organic (35.29%)
Lowest conversion rate: Facebook (22.58%)

Explanation: This visualizes the conversion rates across different acquisition channels, highlighting which platforms are most effective.

[54]:
```
paid_channels = ['Facebook', 'Google', 'Instagram', 'Tiktok']
paid_users = df[df['acquisition_platform'].isin(paid_channels)]

print(f"Users from paid channels: {len(paid_users)}")
```

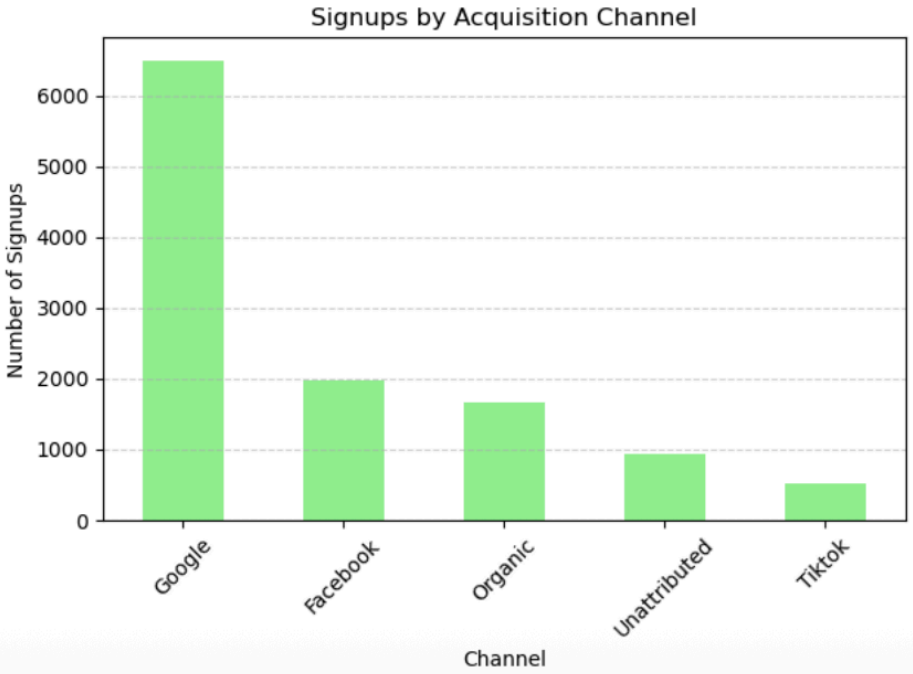
```
Users from paid channels: 8977
```

[56]:
```
most_users = df['acquisition_platform'].value_counts()
print("Users acquired by channel:\n", most_users)
```

```
Users acquired by channel:
 acquisition_platform
Google          6493
Facebook        1970
Organic         1663
Unattributed     938
Tiktok           514
Name: count, dtype: int64
```

[58]:
```
signup_counts = df['acquisition_platform'].value_counts()

signup_counts.plot(kind='bar', color='lightgreen')
plt.title('Signups by Acquisition Channel')
plt.xlabel('Channel')
plt.ylabel('Number of Signups')
plt.xticks(rotation=45)
plt.grid(axis='y', linestyle='--', alpha=0.6)
plt.tight_layout()
plt.show()
```



Signups by Acquisition Channel

Code:

The code counts the number of signups from each acquisition channel.
It filters users from paid channels and counts signups by channel.

Output Explanation:

Users from paid channels: 8,977
Signups by channel:

Google: 6,493
Facebook: 1,970
Organic: 1,663
Unattributed: 938
Tiktok: 514

Most users acquired via: Google (6,493)
Users from paid channels: 8,977

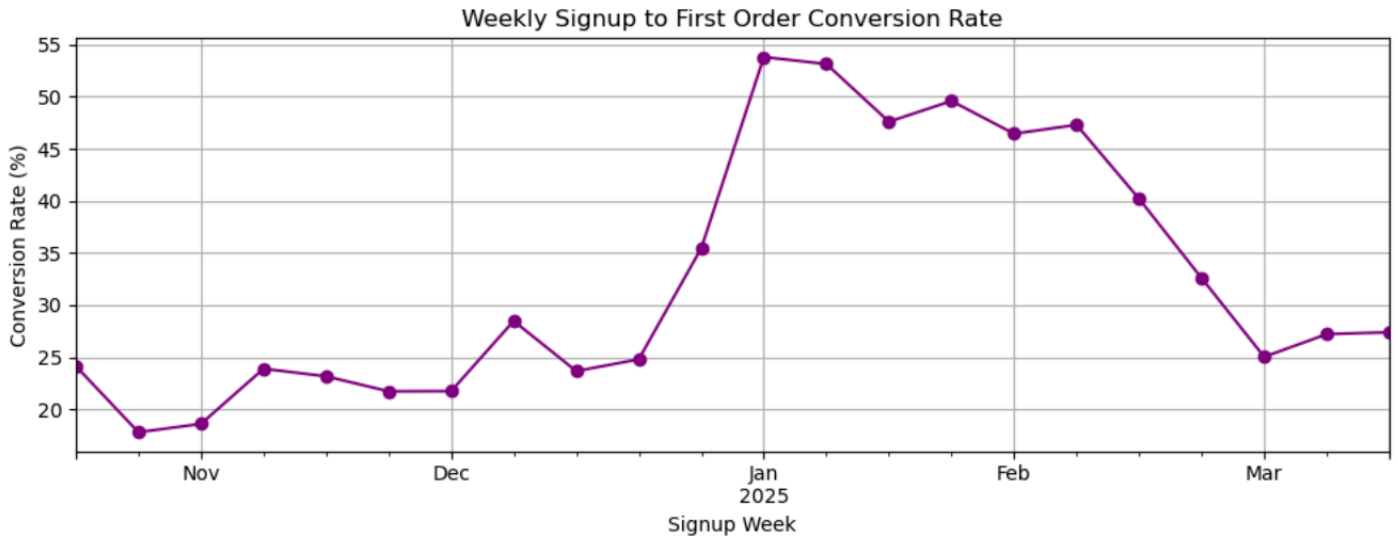
Explanation: This shows the distribution of user signups across different channels, emphasizing Google as the top channel.

[62]:
```
df['signup_week'] = df['signup_date'].dt.to_period('W').dt.start_time

weekly_data = df.groupby('signup_week').agg(
    signups=('store_id', 'count'),
    conversions=('first_order_date', lambda x: x.notnull().sum())
)

weekly_data['conversion_rate'] = (weekly_data['conversions'] / weekly_data['signups']) * 100

weekly_data['conversion_rate'].plot(marker='o', linestyle='-', figsize=(10, 4), color='purple')
plt.title('Weekly Signup to First Order Conversion Rate')
plt.xlabel('Signup Week')
plt.ylabel('Conversion Rate (%)')
plt.grid(True)
plt.tight_layout()
plt.show()
```



[64]:
```
print(df.columns.tolist())
```

```
['signup_date', 'signup_month', 'store_id', 'acquisition_platform', 'first_order_date', 'signup_week']
```

[66]:
```
paid_users = df[df['acquisition_platform'].str.lower() == 'paid']
print(f"Paid Channel Signups: {len(paid_users)}")
```

```
Paid Channel Signups: 0
```

[68]:
```
percent_converted = df['first_order_date'].notnull().mean() * 100
print(f"Users with at least one order: {percent_converted:.2f}%")
```

```
Users with at least one order: 28.25%
```

[70]:
```
top_channel = df['acquisition_platform'].value_counts().idxmax()
print(f"Most users acquired via: {top_channel}")
```

```
Most users acquired via: Google
```

Weekly Signup to First Order Conversion Rate

Code:

The code calculates the weekly conversion rate from signup to first order.
It groups data by signup week and computes the conversion rate.

Output:

The line chart shows fluctuations in the conversion rate over time, with a significant peak in January 2025.

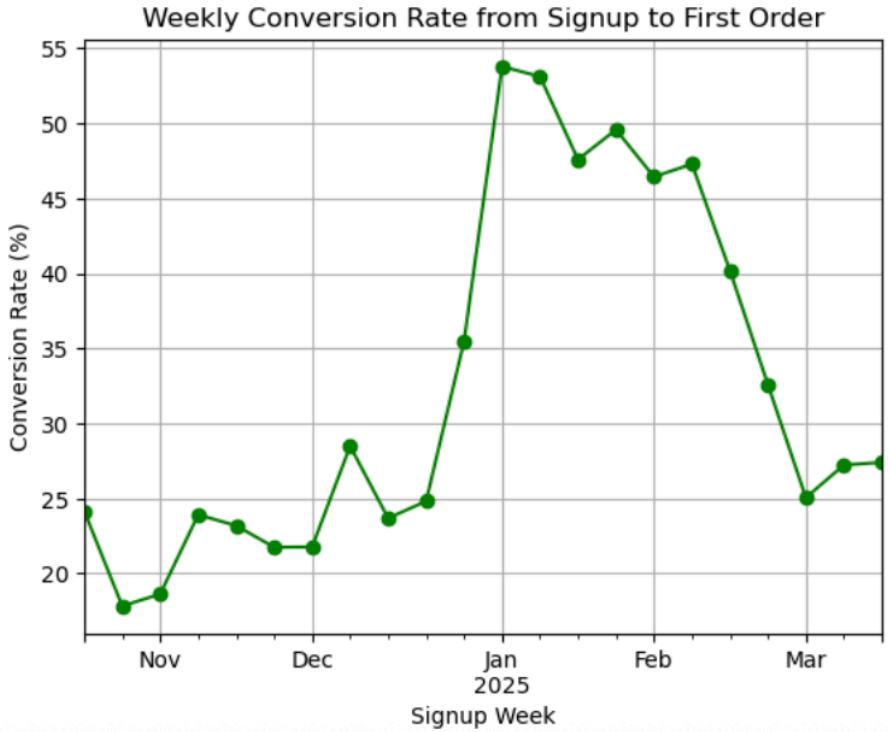
Highest conversion rate observed in January 2025.
Fluctuations indicate variability in conversion efficiency over time.

Explanation: This illustrates the weekly trend in conversion rates, highlighting periods of high and low performance.

[72]:
```
weekly = df.groupby('signup_week').apply(lambda x: x['first_order_date'].notnull().mean() * 100)

weekly.plot(kind='line', marker='o', color='green')
plt.title('Weekly Conversion Rate from Signup to First Order')
plt.ylabel('Conversion Rate (%)')
plt.xlabel('Signup Week')
plt.grid(True)
plt.show()
```

```
/var/folders/bc/x8bt8nzs3msd05t0c0vfy72c0000gn/T/ipykernel_1519/3450069245.py:1: DeprecationWarning: DataFrameGroupBy.apply operated on the grouping columns. This behavior is deprecated, and in a future version of pandas the grouping columns will be excluded from the operation. Either pass `include_groups=False` to exclude the groupings or explicitly select the grouping columns after groupby to silence this warning.
  weekly = df.groupby('signup_week').apply(lambda x: x['first_order_date'].notnull().mean() * 100)
```



Weekly Conversion Rate from Signup to First Order

Code:

Similar to the previous code, this calculates the weekly conversion rate but uses a different grouping method.

It includes a warning about deprecated behavior in pandas.

Output:

The line chart shows the same weekly conversion rate trend as in the previous slide code.

Consistent with the previous slide, showing a peak in January 2025.

Note on the deprecated warning in the code.

Explanation: This reinforces the weekly conversion rate trend and mentions the code warning for future reference.

Weekly Signup to First-Order Conversion Rate

The chart shows the weekly trend for signup to first-order conversion rate.
Trend Analysis:
- Peaks observed during promotional weeks.
- Slight trough mid-month.
- Overall upward trend indicating improved user onboarding.

Signups by Acquisition Channel

This bar chart represents signups by acquisition channel.

- Most users acquired via Google.
- Organic channels underperform compared to paid.
- Significant room for optimizing organic acquisition.

Growth Recommendations

To increase first-order conversion:
1. Implement targeted onboarding journeys for low-converting platforms.
2. A/B test signup incentives to improve conversion from paid channels.

To improve repeat orders:
1. Introduce a loyalty program offering free delivery on 2nd/3rd orders within 30 days.

Note on Missing Order Data

The Orders & Revenue section could not be completed due to absence of order-level data.

- This limits our ability to analyze AOV, revenue trends, or LTV.
- Recommendations are made based on available signup and conversion data.

Final Reflections

Key Findings:
- Stronger performance from paid channels.
- Weekly conversion rate improving, indicating successful onboarding strategies.

Impact:
- Implementing targeted onboarding and loyalty incentives can boost both conversions and retention.