Daily Transactions Project

April 4, 2025

[72]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

[73]:
```
daily_transactions = pd.read_csv("Daily Household Transactions.csv")
df = daily_transactions
```

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```

[74]:
```
## Checking the loaded data only 5 records
df.head()
```

[74]:

	Date	Mode	Category	Subcategory	Note	Amount	Income/Expense	Currency
0	20/09/2018 12:04:08	Cash	Transportation	Train	2 Place 5 to Place 0	30.0	Expense	INR
1	20/09/2018 12:03:15	Cash	Food	snacks	Idli medu Vada mix 2 plates	60.0	Expense	INR
2	19/09/2018	Saving Bank account 1	subscription	Netflix	1 month subscription	199.0	Expense	INR
3	17/09/2018 23:41:17	Saving Bank account 1	subscription	Mobile Service Provider	Data booster pack	19.0	Expense	INR
4	16/09/2018 17:15:08	Cash	Festivals	Ganesh Pujan	Ganesh idol	251.0	Expense	INR

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[75]:
```
## Checking the column types
df.info()
```

```
df.shape
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2461 entries, 0 to 2460
Data columns (total 8 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Date            2461 non-null   object
 1   Mode            2461 non-null   object
 2   Category        2461 non-null   object
 3   Subcategory     1826 non-null   object
 4   Note            1940 non-null   object
 5   Amount          2461 non-null   float64
 6   Income/Expense  2461 non-null   object
 7   Currency        2461 non-null   object
dtypes: float64(1), object(7)
memory usage: 153.9+ KB
```

[75]:
```
(2461, 8)
```

[ ]:
```

```

[76]:
```
## Check for missing values
df.isnull().sum()
```

[76]:
```
Date               0
Mode               0
Category           0
Subcategory      635
Note             521
Amount             0
Income/Expense     0
Currency           0
dtype: int64
```

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[77]:
```
## Changing format of date column from object to date and bring consistency in␣
↪date
df['Date'] = pd.to_datetime(df['Date'], format='mixed', dayfirst=True).dt.date
df.head()
```

[77]:
```
         Date                  Mode        Category              Subcategory  \
0  2018-09-20                  Cash  Transportation                    Train
```

```
1  2018-09-20                  Cash           Food                   snacks
2  2018-09-19  Saving Bank account 1   subscription                  Netflix
3  2018-09-17  Saving Bank account 1   subscription  Mobile Service Provider
4  2018-09-16                  Cash      Festivals             Ganesh Pujan

                         Note  Amount Income/Expense Currency
0        2 Place 5 to Place 0    30.0        Expense      INR
1  Idli medu Vada mix 2 plates   60.0        Expense      INR
2        1 month subscription   199.0        Expense      INR
3           Data booster pack    19.0        Expense      INR
4                 Ganesh idol   251.0        Expense      INR
```

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[78]:
```
#Dropping duplicate values in the dataset
df.drop_duplicates(inplace=True)
```

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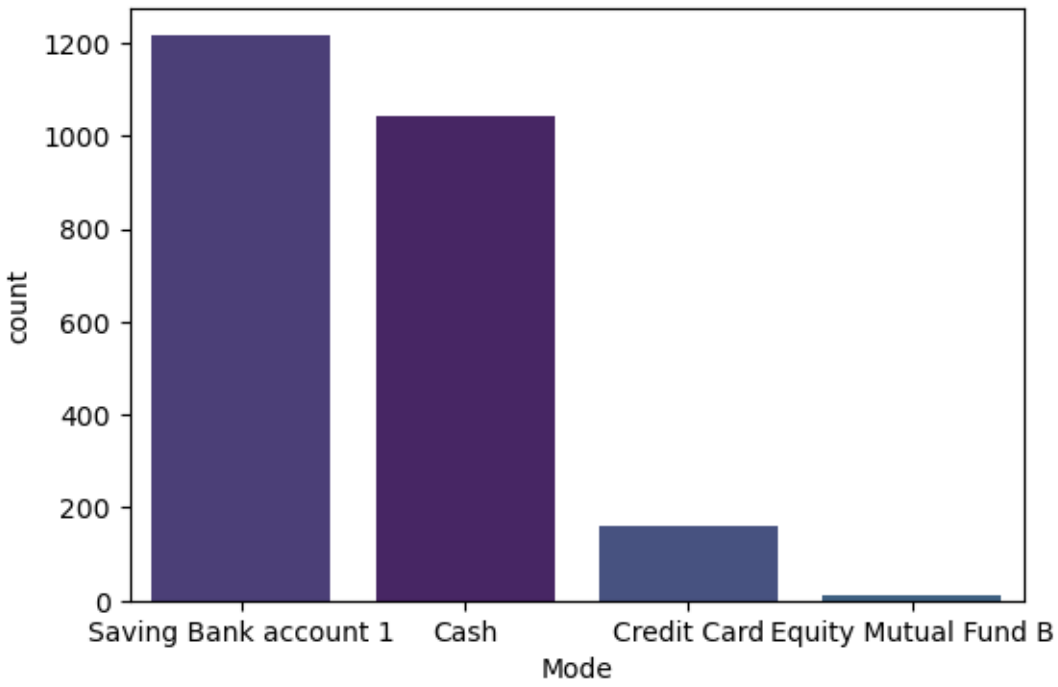
[79]:
```
# Finding out the frequency of the mode of transactions
df["Mode"].value_counts()
```

[79]:
```
Mode
Saving Bank account 1    1215
Cash                     1043
Credit Card               162
Equity Mutual Fund B       11
Share Market Trading        5
Saving Bank account 2       5
Recurring Deposit           3
Debit Card                  2
Equity Mutual Fund C        1
Equity Mutual Fund A        1
Equity Mutual Fund D        1
Fixed Deposit               1
Name: count, dtype: int64
```

[80]:
```
# Plotting the frequency of unique values on bar plot

plt.figure(figsize = (6,4))
sns.countplot(data = df, x = "Mode", hue="Mode", order = df["Mode"].
 ↪value_counts().iloc[:4].index, palette="viridis")
plt.show()
```



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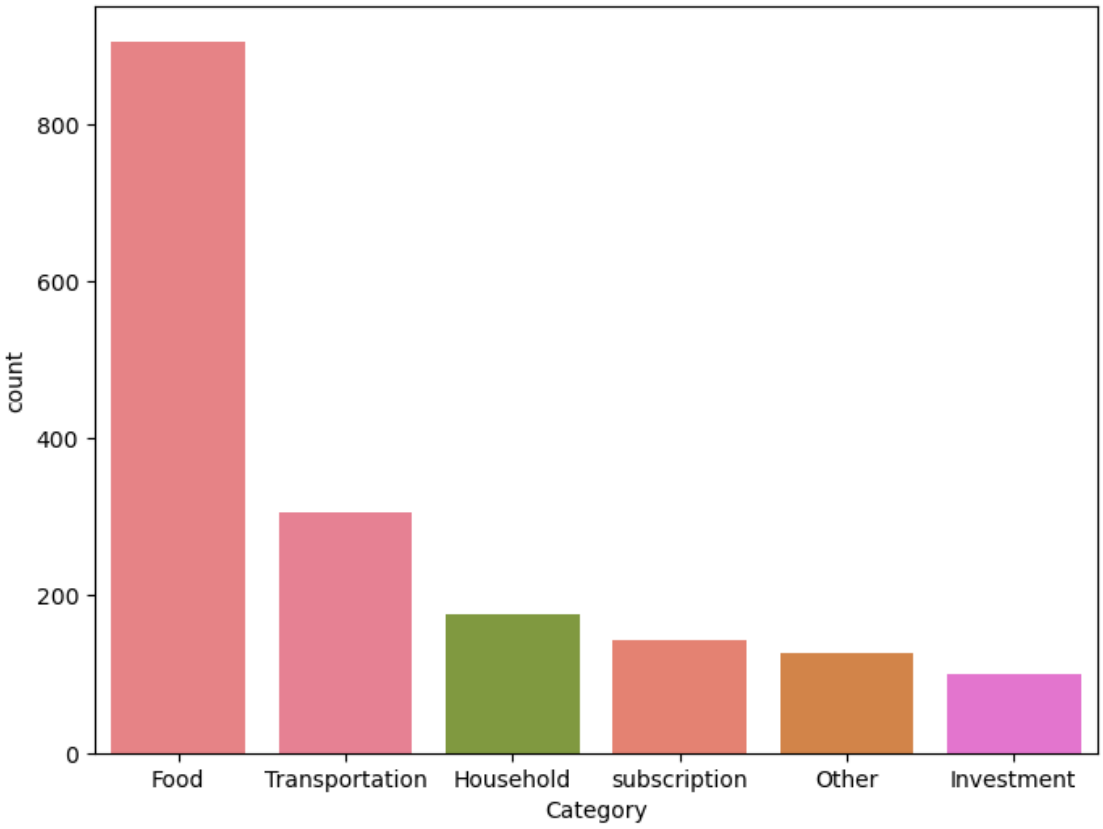
[81]:
```
## Category wise frequency
df["Category"].value_counts()
```

[81]:
```
Category
Food                    905
Transportation          306
Household               176
subscription            143
Other                   126
Investment              101
Health                   94
Family                   71
Apparel                  47
Money transfer           43
Salary                   43
Recurring Deposit        41
Gift                     30
Public Provident Fund    29
Equity Mutual Fund E     22
Beauty                   22
```

```
Gpay Reward                   21
Education                     18
maid                          17
Saving Bank account 1         17
Festivals                     16
Equity Mutual Fund A          14
Equity Mutual Fund F          13
Interest                      12
Dividend earned on Shares     12
Culture                       11
Small cap fund 1              10
Small Cap fund 2              10
Share Market                   8
Maturity amount                7
Life Insurance                 7
Bonus                          6
Equity Mutual Fund C           6
Petty cash                     6
Tourism                        5
Cook                           4
Rent                           4
Grooming                       4
water (jar /tanker)            3
Saving Bank account 2          3
garbage disposal               2
scrap                          2
Fixed Deposit                  2
Self-development               2
Amazon pay cashback            2
Documents                      2
Tax refund                     2
Equity Mutual Fund B           1
Equity Mutual Fund D           1
Social Life                    1
Name: count, dtype: int64
```

[82]:
```
## Plotting frequency of category column on bar plot.

plt.figure(figsize = (8,6))
sns.countplot(data = df, x = "Category", hue="Category", order = df["Category"].
 ↪value_counts().iloc[:6].index)
plt.show()
```



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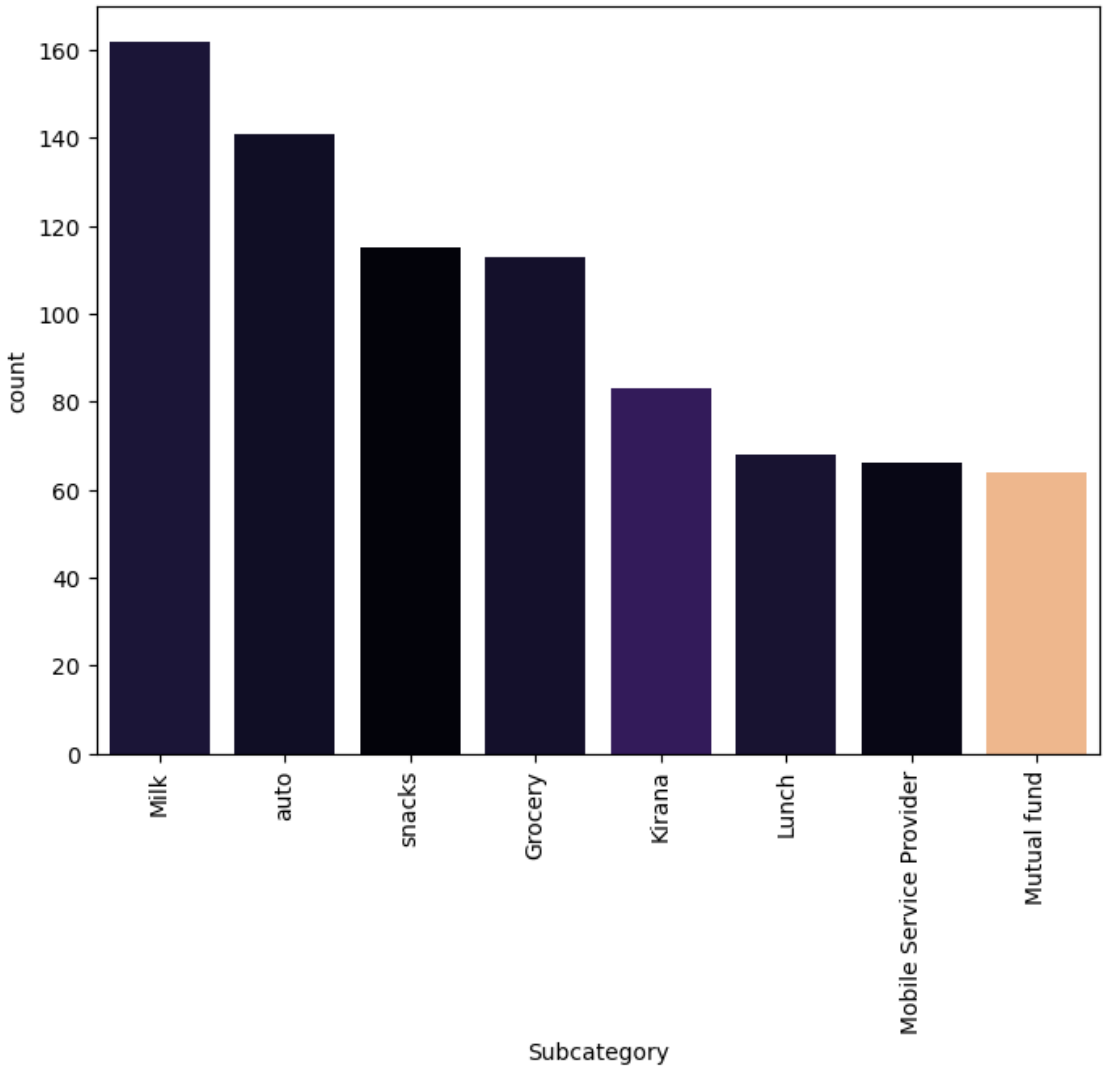
[83]:
```
## Plotting the highest frequency of value from subcategory

df["Subcategory"].unique()
```

[83]:
```
array(['Train', 'snacks', 'Netflix', 'Mobile Service Provider',
       'Ganesh Pujan', 'Tata Sky', 'auto', nan, 'Grocery', 'Lunch',
       'Milk', 'Pocket money', 'Laundry', 'breakfast', 'Dinner', 'Sweets',
       'Kirana', 'Ice cream', 'curd', 'Biscuits', 'Rajgira ladu',
       'Navratri', 'train', 'Tea', 'flour mill', 'Appliances',
       'home decor', 'grooming', 'Health', 'Clothing', 'clothes', 'Home',
       'chocolate', 'Medicine', 'Eating out', 'Movie', 'vegetables',
       'fruits', 'Potato', 'Onions', 'Taxi', 'Hardware', 'Eggs', 'Bread',
       'Petrol', 'Hospital', 'Mahanagar Gas', 'Lab Tests', 'Bus',
       'Travels', 'Kitchen', 'Footwear', 'Entry Fees', 'gadgets',
       'Accessories', 'misc', 'Stationary', 'Newspaper', 'Toiletries',
       'Bike', 'beverage', 'makeup', 'Books', 'Holi', 'Courier',
```

```
       'Leisure', 'Updation', 'Amazon Prime', 'Edtech Course', 'Hotstar',
       'Diwali', 'Wifi Internet Service', 'Trip', 'Furniture', 'Water',
       'Cable TV', 'medicine', 'Mutual fund', 'Public Provident Fund',
       'ropeway', 'RD', 'LIC', 'Saloon', 'gift', 'Rakshabandhan',
       'exam fee', 'Kindle unlimited', 'OTT Platform', 'School supplies',
       'Audible', 'Makeup'], dtype=object)
```

[84]:
```
plt.figure(figsize = (8,6))
sns.countplot(data = df, x = "Subcategory", hue="Subcategory", legend=False,␣
↪order = df["Subcategory"].value_counts().iloc[:8].index, palette="magma")
plt.xticks(rotation = 90)
plt.show()
```



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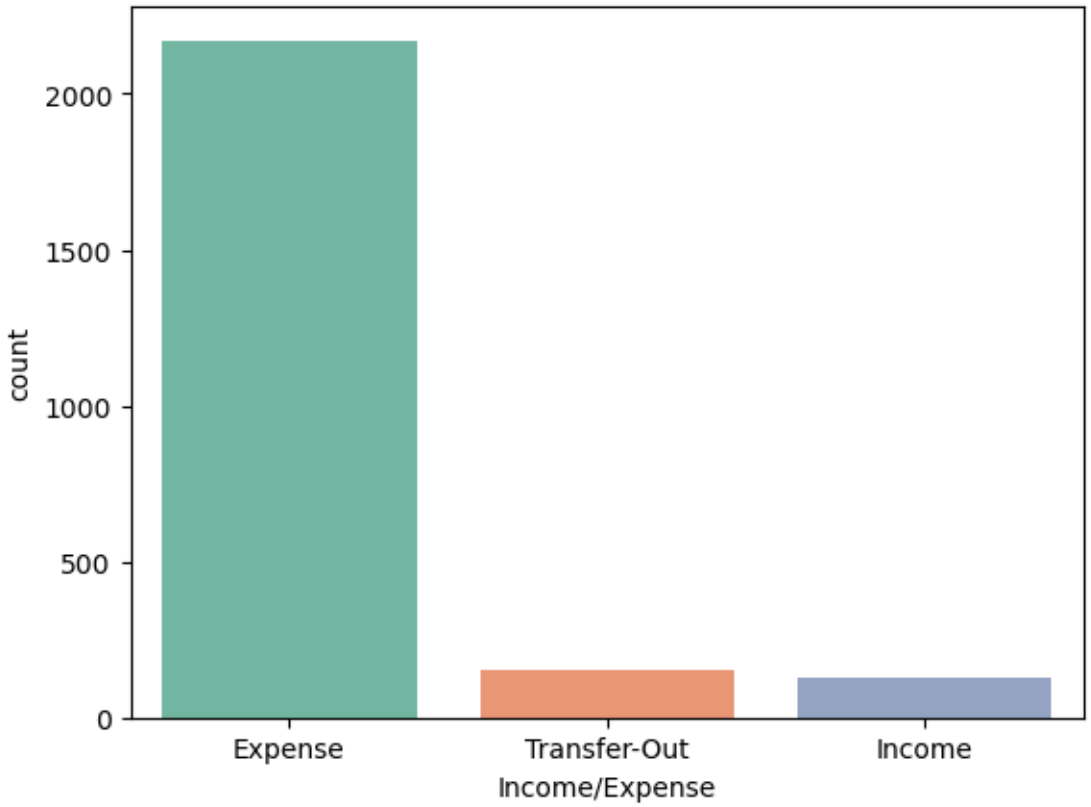
[85]:
```
# Plotting the count of transactions having income or expense

sns.countplot(data = df, x = "Income/Expense" , hue="Income/Expense",␣
↪legend=False, palette="Set2");
```



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[86]:
```
#Finding unique values in note column

df["Note"].nunique()
```

[86]: 1057

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[87]:
```
# Count of currency values
df["Currency"].value_counts()
```

[87]:
```
Currency
INR    2450
Name: count, dtype: int64
```

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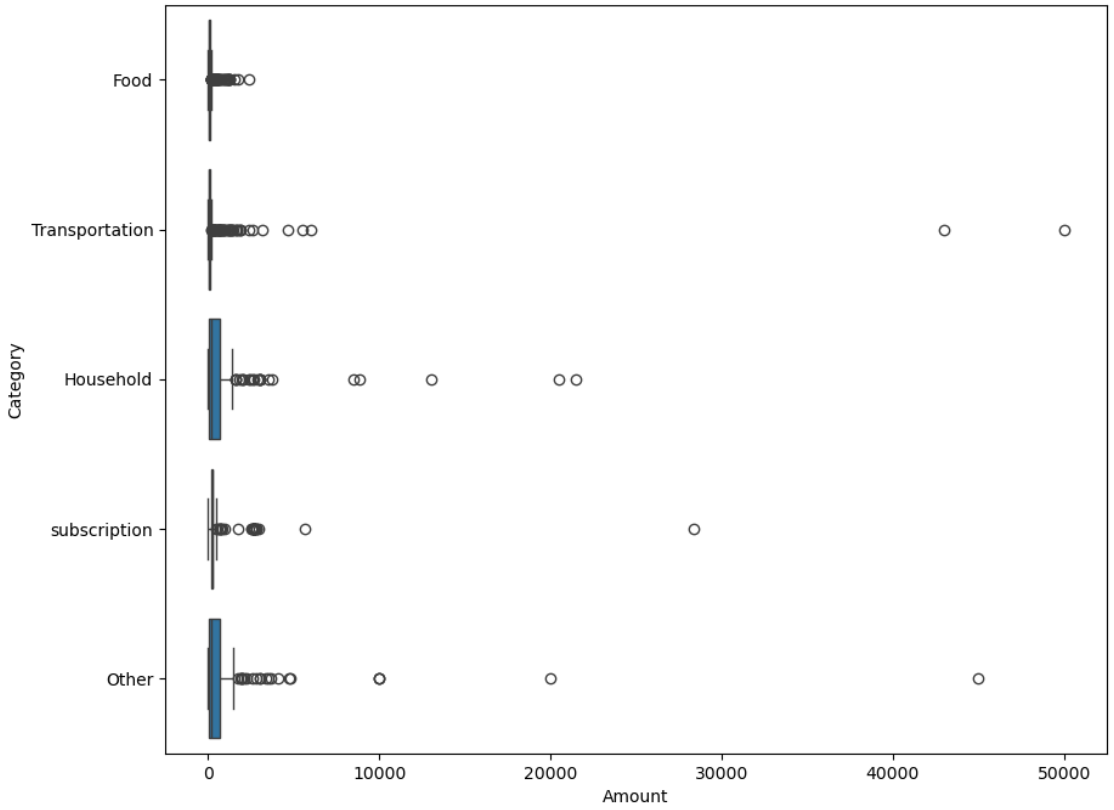
[88]:
```
# Finding out the variability in the "Amount" within each category.
# Which categories have higher median transaction amounts.
# Finding out the outliers in each of Five top categories.

plt.figure(figsize = (10,8))
sns.boxplot(data = df, x = "Amount", y = "Category", order = df["Category"].
 ↪value_counts().iloc[:5].index)
plt.show()
```



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[89]:
```
# Finding out the variability in the "Amount" within each category.
# Which categories have higher median transaction amounts.
```

```
# Finding out the outliers in each of five Ten categories.
#What This Box Plot Represents:

#Each box corresponds to a "Subcategory" (only the top 10 by count).

#The x-axis ("Amount") shows the distribution of transaction amounts.

#Each box provides key statistical insights:

#The median (central line in the box): Represents the middle transaction amount␣
 ↪for that subcategory.

#The Interquartile Range (IQR): The range between the 25th percentile (Q1) and␣
 ↪the 75th percentile (Q3), indicating where most values fall.

#Whiskers: Extend up to 1.5 times the IQR from Q1 and Q3, covering most data␣
 ↪points.

#Outliers (dots outside whiskers): Extreme transaction amounts that are␣
 ↪significantly different from the rest.

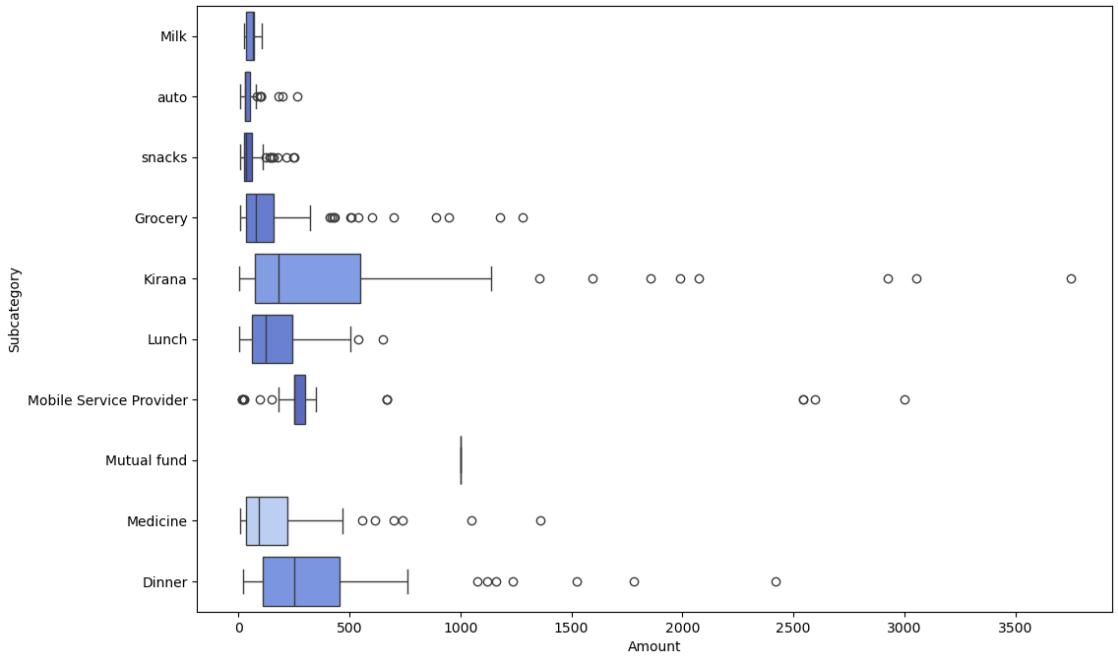
#Insights You Can Get from This Plot
#Which subcategories have higher transaction amounts on average?

#Which subcategories have the most variability in transaction amounts?

#Are there many extreme values (outliers) in some subcategories?

#Are there subcategories where transactions tend to be more consistent?␣
 ↪(Smaller boxes indicate less variation)

plt.figure(figsize = (12,8))
sns.boxplot(data = df, x = "Amount", y = "Subcategory", hue = "Subcategory",␣
 ↪legend=False, order = df["Subcategory"].value_counts().iloc[:10].index,␣
 ↪palette="coolwarm")
plt.show()
```



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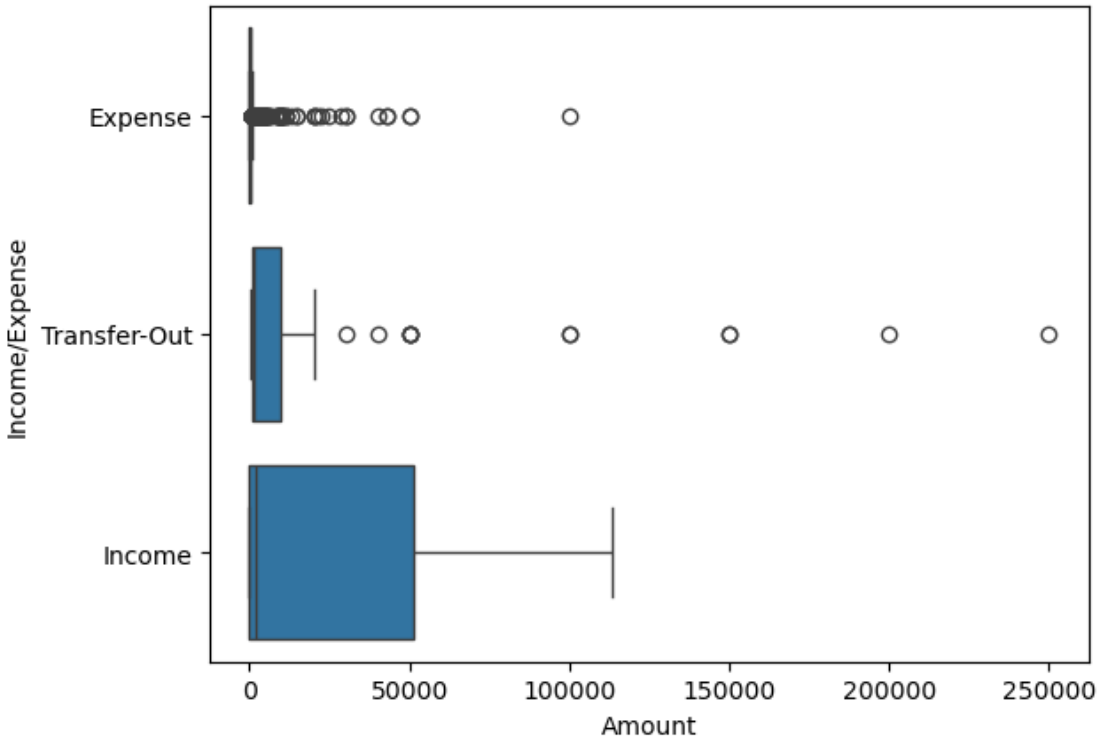
[90]:
```
sns.boxplot(data = df, x = "Amount", y = "Income/Expense");
```



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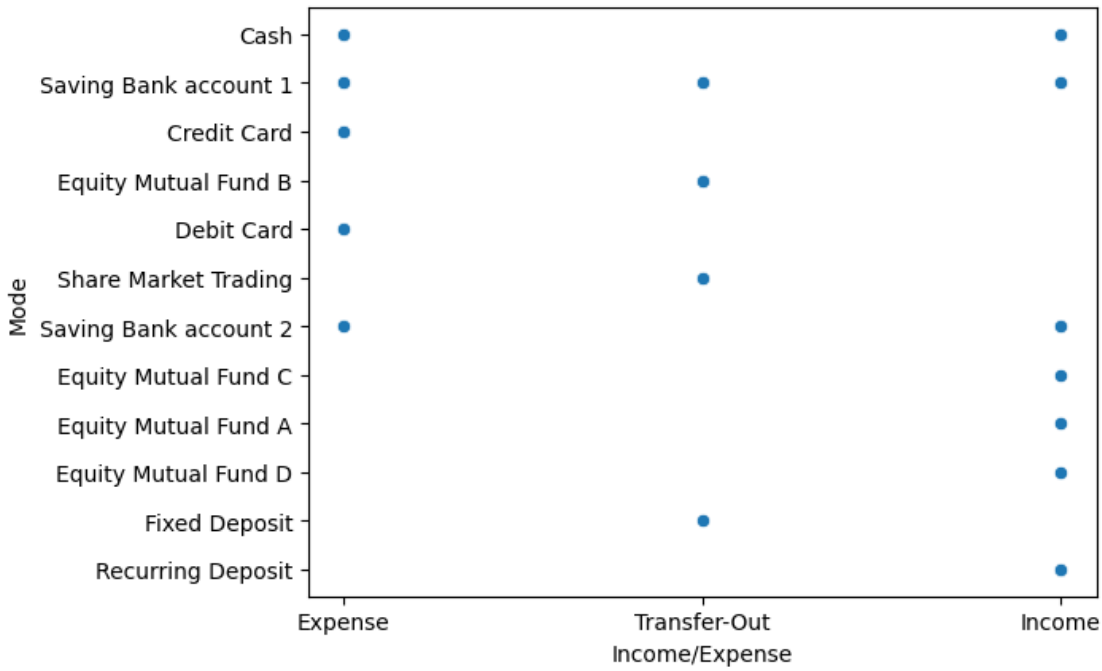
[91]:
```
sns.scatterplot(data = df, x = "Income/Expense", y = "Mode");
```



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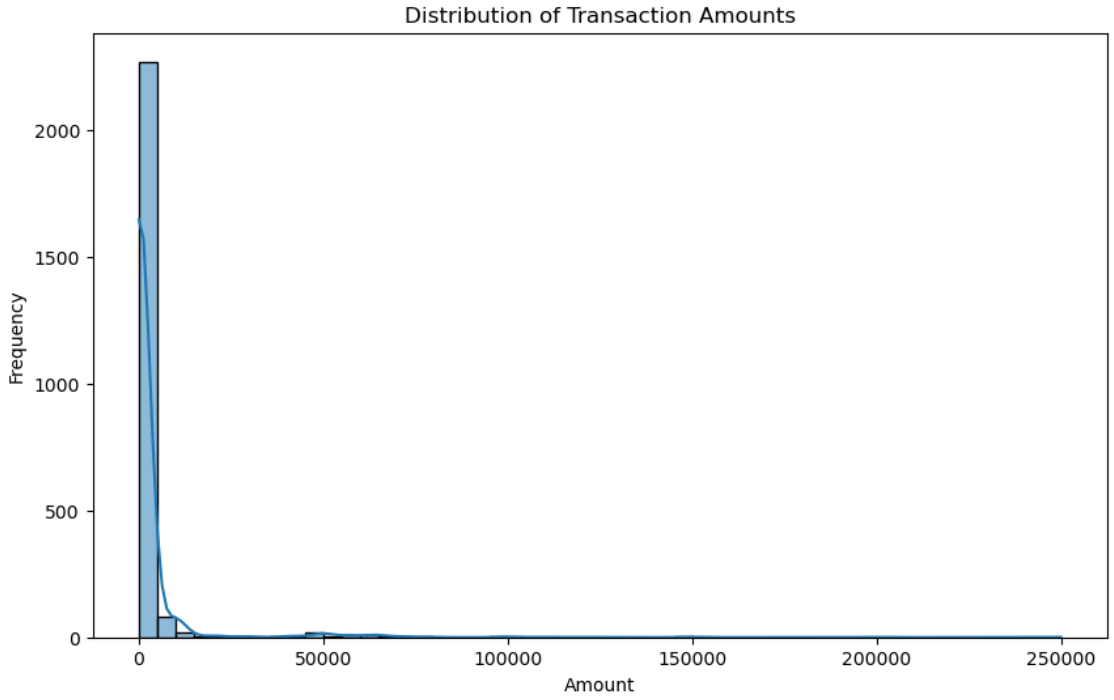
[92]:
```
# Distribution of transaction amounts

plt.figure(figsize=(10,6))
sns.histplot(df['Amount'], bins=50, kde=True)
plt.title("Distribution of Transaction Amounts")
plt.xlabel("Amount")
plt.ylabel("Frequency")
plt.show()
```



[100]:
```
df
```

[100]:

Date	Mode	Category	Subcategory	Note	Amount	Income/Expense
2018-09-20	Cash	Transportation	Train	2 Place 5 to Place 0	30.0	Expense
2018-09-20	Cash	Food	snacks	Idli medu Vada mix 2 plates	60.0	Expense
2018-09-19	Saving Bank account 1	subscription	Netflix	1 month subscription	199.0	Expense
2018-09-17	Saving Bank account 1	subscription	Mobile Service Provider	Data booster pack	19.0	Expense
2018-09-16	Cash	Festivals	Ganesh Pujan	Ganesh idol	251.0	Expense
…	…	…	…	…	…	…
2015-01-01	Cash	Transportation	NaN			
2015-01-01	Cash	Transportation	NaN			
2015-01-01	Cash	Transportation	NaN			
2015-01-01	Cash	Food	NaN			
2015-01-01	Cash	Transportation	NaN			

```
2015-01-01      share jeep - Place T base to top    20.0        Expense
2015-01-01  share auto - Place H to Place T base    20.0        Expense
2015-01-01                  bus - brc to Place H    30.0        Expense
2015-01-01                                   tea    10.0        Expense
2015-01-01  share auto - hospital to brc station    10.0        Expense

           Currency
Date
2018-09-20      INR
2018-09-20      INR
2018-09-19      INR
2018-09-17      INR
2018-09-16      INR
…               …
2015-01-01      INR
2015-01-01      INR
2015-01-01      INR
2015-01-01      INR
2015-01-01      INR

[2450 rows x 7 columns]
```

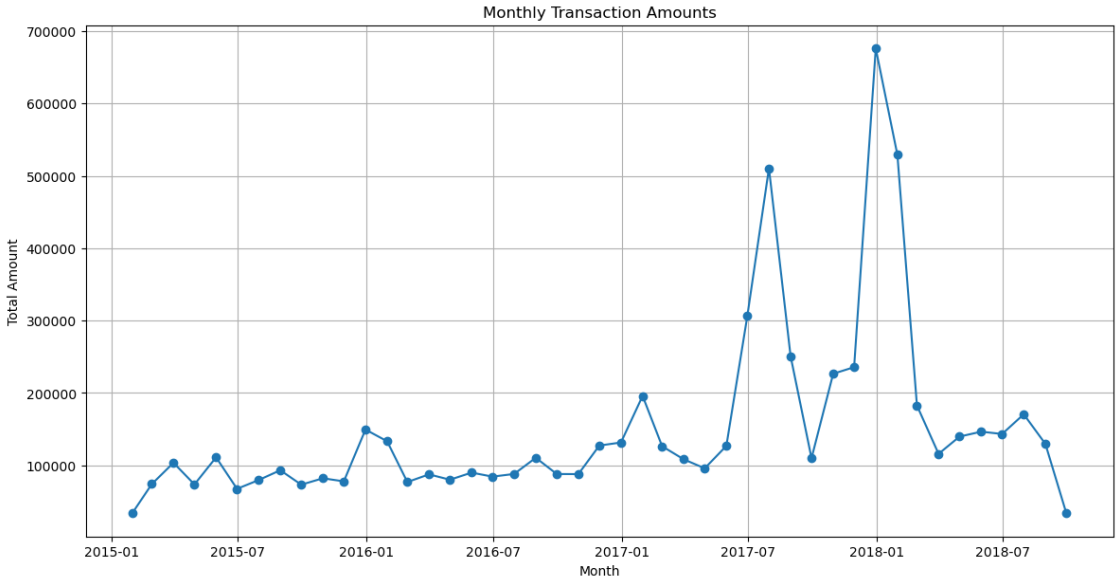
[102]:

[106]:
```python
# Resample data to monthly frequency

monthly_data = df.resample('ME').sum()

plt.figure(figsize=(14, 7))
plt.plot(monthly_data.index, monthly_data['Amount'], marker='o')
plt.title('Monthly Transaction Amounts')
plt.xlabel('Month')
plt.ylabel('Total Amount')

plt.grid(True)
plt.show()
```



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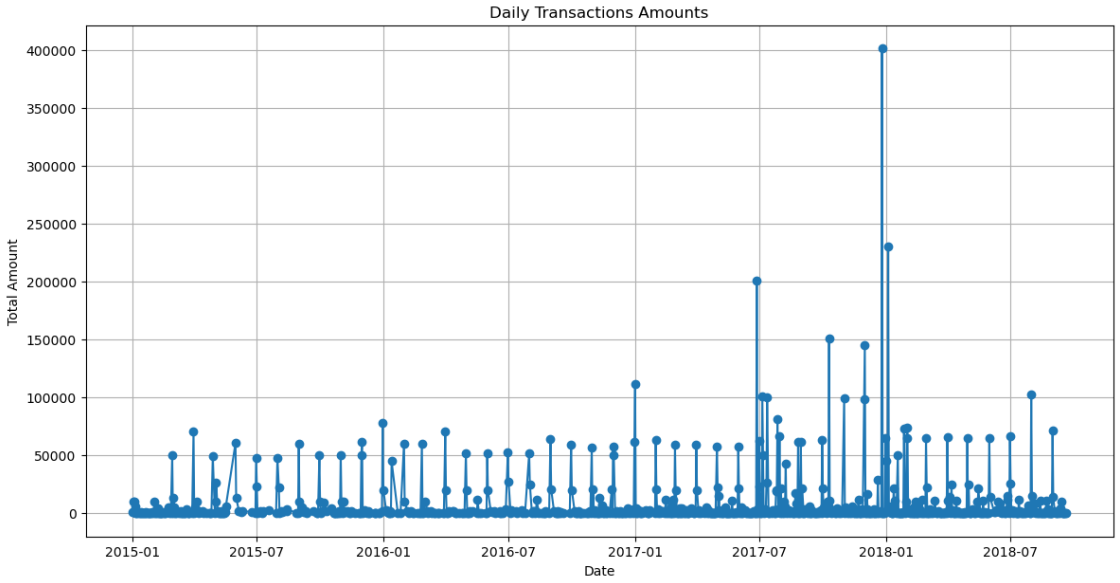
[111]:
```
# Daily trends

daily_data = df.groupby(df.index.date).sum()

plt.figure(figsize=(14, 7))
plt.plot(daily_data.index, daily_data['Amount'], marker='o')
plt.title('Daily Transactions Amounts')
plt.xlabel('Date')
plt.ylabel('Total Amount')
plt.grid(True)
plt.show()
```



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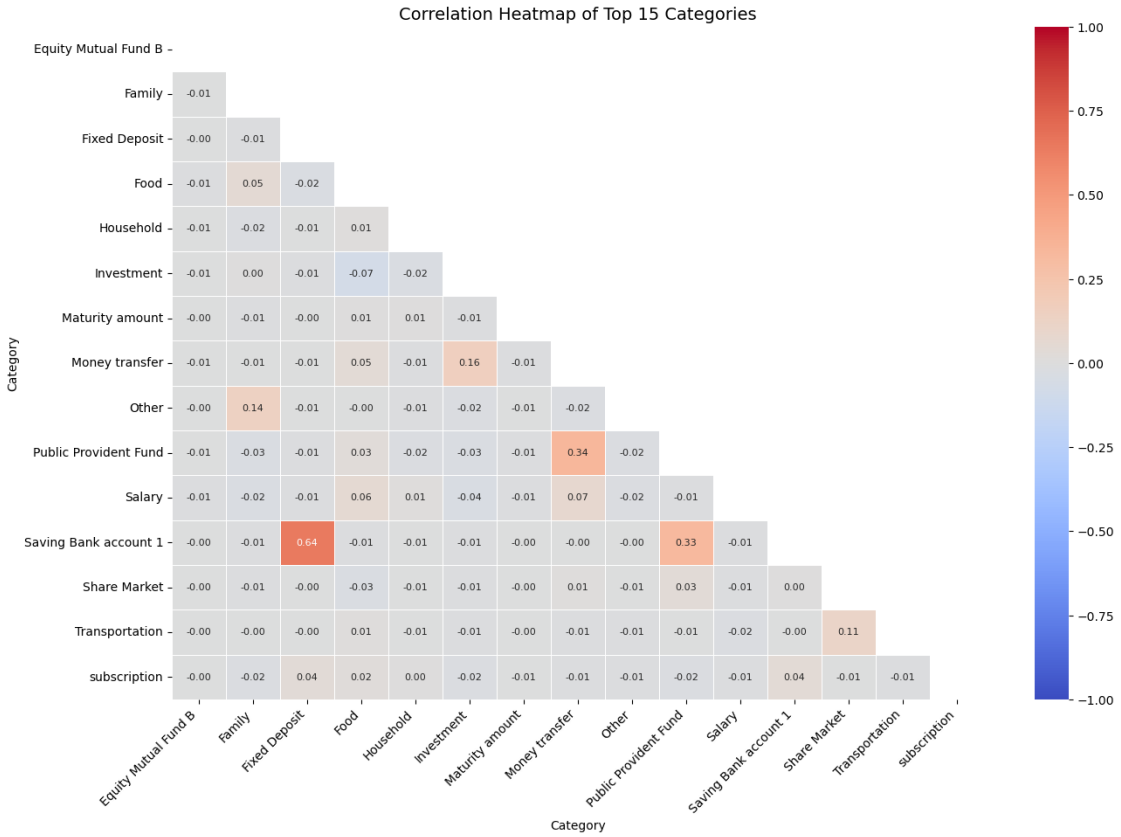
[125]:
```
top_categories = df.groupby("Category")['Amount'].sum().nlargest(15).index
```

[126]:
```
pivot_table = df[df['Category'].isin(top_categories)].pivot_table(index='Date',␣
↪columns='Category', values='Amount', aggfunc='sum', fill_value=0)
```

[128]:
```
correlation_matrix = pivot_table.corr()

plt.figure(figsize=(15, 10))

# Mask the upper triangle to reduce redundancy
mask = np.triu(np.ones_like(correlation_matrix, dtype=bool))

# Create a heatmap with the mask applied
sns.heatmap(correlation_matrix, mask=mask, annot=True, fmt=".2f",␣
↪cmap="coolwarm",
            linewidths=0.5, vmin=-1, vmax=1, annot_kws={"size": 8})

# Improve readability
plt.xticks(rotation=45, ha='right', fontsize=10)
plt.yticks(fontsize=10)
plt.title("Correlation Heatmap of Top 15 Categories", fontsize=14)

plt.show()
```


Correlation Heatmap of Top 15 Categories
Equity Mutual Fund B
Family
Fixed Deposit
Food
Household
Investment
Maturity amount
Money transfer
Other
Public Provident Fund
Salary
Saving Bank account 1
Share Market
Transportation
subscription
Category
Category
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

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