Fetch Rewards Coding Exercise - Data Analytics Internship

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Based on my analysis of the data, I have observed that there are indications of fraudulent activities where users are submitting fake receipts to the system. For instance, I have identified instances where a single user spent an unusually large amount of money in a short period of time. In August, one user spent a total of 157,719.27, and upon further investigation, it was discovered that the most expensive item purchased was a Starbucks Iced Coffee Premium Coffee Beverage which totaled 31,005.99.

To safeguard our company's interests and discourage such dishonest behavior, I recommend shifting our focus towards identifying and preventing fraudulent rewards. This could involve implementing monitoring mechanisms for high-value purchases. By proactively taking measures to prevent such fraudulent activities, we can ensure that our loyalty program remains fair and trustworthy for all users.

Furthermore, the analysis reveals that the number of users scanning each month is relatively consistent with a slight increase during the holiday season in December and January. Additionally, I have provided a table below of the top 10 brands that users spent the most money on in June.

In [1]:

```
import pandas as pd
import sqlite3
import matplotlib.pyplot as plt
```

In [2]:

```
#Using pandas to load each csv file into its own data frame
receipts_df = pd.read_csv("receipts.csv")
receipt_items_df = pd.read_csv("receipt_items.csv")
brands_df = pd.read_csv("brands.csv")
users_df = pd.read_csv("users.csv")
```

In [3]:

```
#I will be using sqlite3
conn = sqlite3.connect('database.db')

#From here I will convert the data frame to a sqlite table
receipts_df.to_sql('receipts', conn, if_exists='replace', index=False)
receipt_items_df.to_sql('receipt_items', conn, if_exists='replace', index=False)
brands_df.to_sql('brands', conn, if_exists='replace', index=False)
users_df.to_sql('users', conn, if_exists='replace', index=False)
```

Out[3]:

```
164
```

Which brand saw the most dollars spent in the month of June?

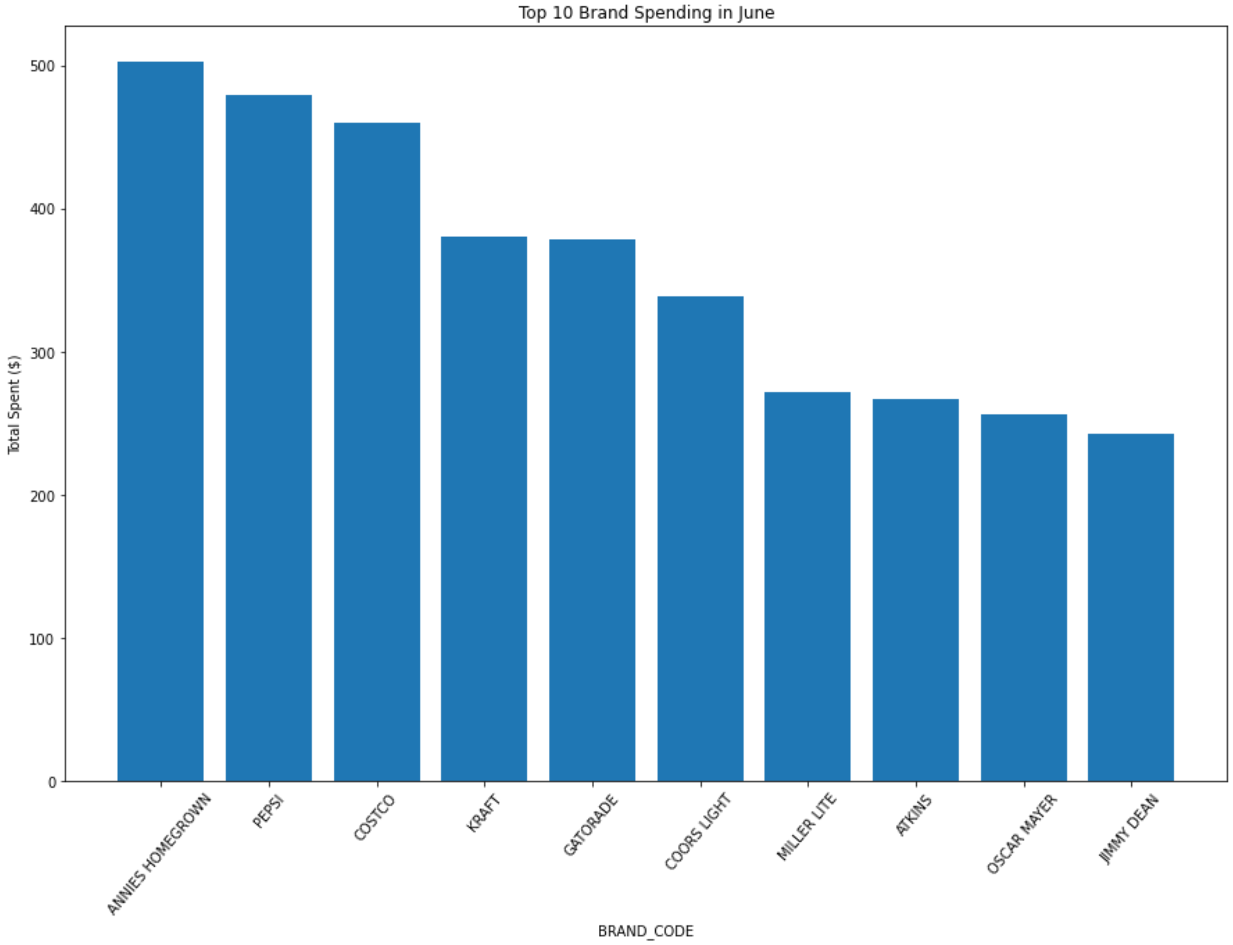
ANNIES HOMEGROWN had the most dollars spent in June with a total of 502.23

In [13]:
```
# Execute a SQL query
query = """
SELECT b.BRAND_CODE, SUM(ri.TOTAL_FINAL_PRICE) as total_spent
FROM receipt_items ri
JOIN receipts r ON r.ID = ri.REWARDS_RECEIPT_ID
JOIN brands b ON ri.BRAND_CODE = b.BRAND_CODE
WHERE strftime('%m', r.DATE_SCANNED) = '06'
GROUP BY b.BRAND_CODE
ORDER BY total_spent DESC
LIMIT 10;
"""
result_df = pd.read_sql_query(query, conn)

# Print the result
result_df
```

Out[13]:

	BRAND_CODE	total_spent
0	ANNIES HOMEGROWN	502.23
1	PEPSI	479.13
2	COSTCO	459.61
3	KRAFT	379.98
4	GATORADE	378.59
5	COORS LIGHT	338.50
6	MILLER LITE	271.90
7	ATKINS	266.38
8	OSCAR MAYER	256.14
9	JIMMY DEAN	242.42

In [18]:
```
plt.figure(figsize=(15, 10)) # adjust the figure size
plt.bar(result_df['BRAND_CODE'], result_df['total_spent'])
plt.xlabel("BRAND_CODE")
plt.ylabel('Total Spent ($)')
plt.title('Top 10 Brand Spending in June')
plt.xticks(range(len(result_df['BRAND_CODE'])), result_df['BRAND_CODE'], rotation=50)
plt.show()
```



Which user spent the most money in the month of August?

user 609ab37f7a2e8f2f95ae968f spent the most in August with a total of 157719.27

In [6]:

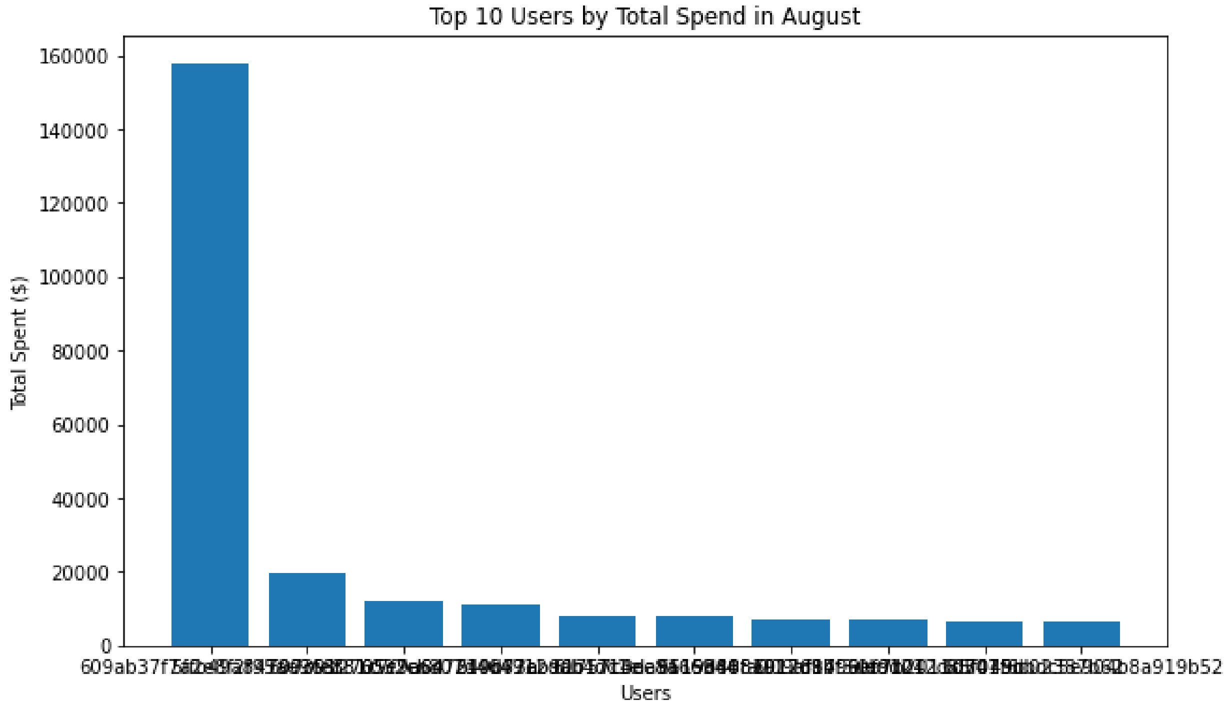
```
query = """
SELECT u.ID, SUM(ri.TOTAL_FINAL_PRICE) as total_spent
FROM receipts r
JOIN users u ON r.USER_ID = u.ID
JOIN receipt_items ri ON r.ID = ri.REWARDS_RECEIPT_ID
WHERE strftime('%m', r.DATE_SCANNED) = '08'
GROUP BY u.ID
ORDER BY total_spent DESC
LIMIT 10;
"""
result_df = pd.read_sql_query(query, conn)

# Print the result
result_df
```

Out[6]:

	ID	total_spent
0	609ab37f7a2e8f2f95ae968f	157719.27
1	5ffb49a847903912705e9a64	19512.85
2	607cfe881c7f7e6d7249b73a	11851.77
3	6032cb807d464912dab4dc1e	11261.56
4	610d67eb90b1714ee8a66944	8186.42
5	61757c3da9619d4881912d84	8084.37
6	6115880fa009af1799ef9104	7067.87
7	601769bf3dedd212c85f049b	7049.90
8	60b7b2011d501f6c02387b62	6515.58
9	607475dbdc5e904b8a919b52	6427.83

In [7]:

```
plt.figure(figsize=(10, 6)) # adjust the figure size
plt.bar(result_df['ID'], result_df['total_spent'])
plt.xlabel("Users")
plt.ylabel('Total Spent ($)')
plt.title('Top 10 Users by Total Spend in August')
plt.show()
```



What user bought the most expensive item?

User 617376b8a9619d488190e0b6 bought the most expensive item 31005.99

In [8]:

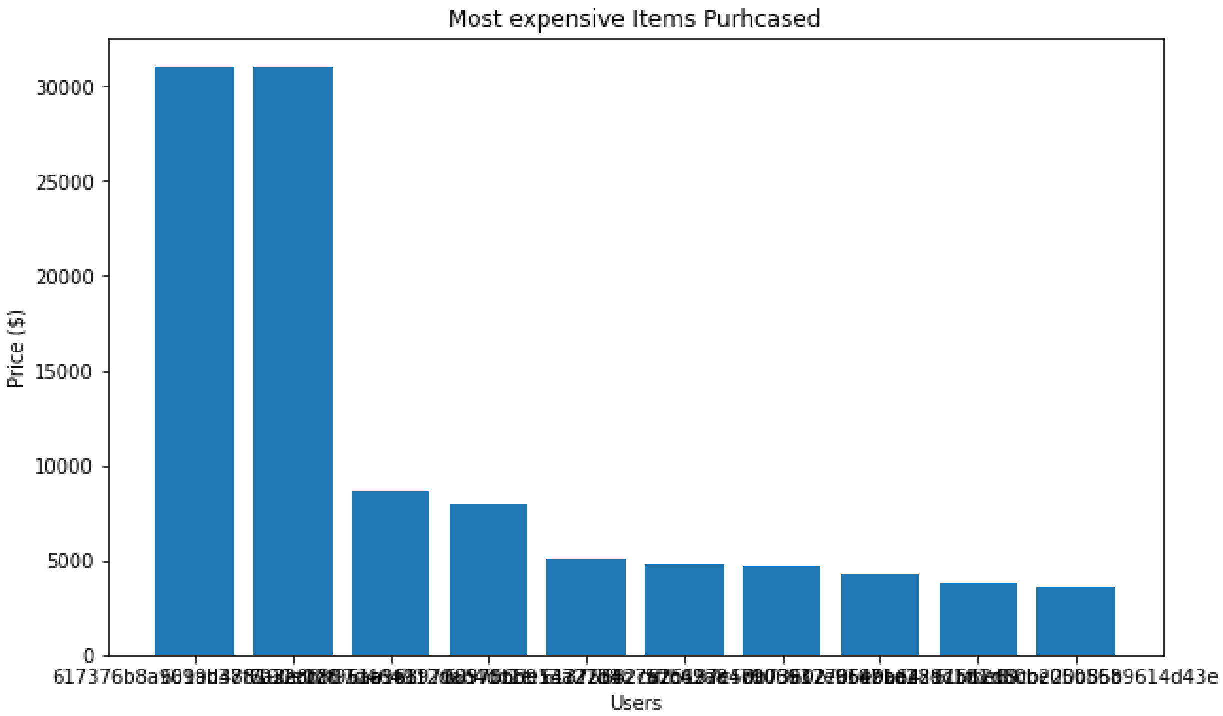
```
#What user bought the most expensive item?
query = """
SELECT r.USER_ID, MAX(ri.TOTAL_FINAL_PRICE) AS max_price
FROM receipts r
JOIN receipt_items ri ON r.ID = ri.REWARDS_RECEIPT_ID
GROUP BY r.USER_ID
ORDER BY max_price DESC
LIMIT 10;
"""

result_df = pd.read_sql_query(query, conn)

# Print the result
result_df
```

Out[8]:

	USER_ID	max_price
0	617376b8a9619d488190e0b6	31005.99
1	609ab37f7a2e8f2f95ae968f	31000.00
2	6032cb807d464912dab4dc1e	8700.00
3	61a1a19706570b5913a27b8c	8005.05
4	609756de547223427a2c627e	5079.28
5	61375682c625197c5db73602	4745.66
6	5ffb49a847903912705e9a64	4713.65
7	6006637e964bbe129c1fbe69	4267.55
8	61671d28d7bd1d50be050568	3747.80
9	61562d8cb220b85b9614d43e	3604.03

In [9]:

```
plt.figure(figsize=(10, 6)) # adjust the figure size
plt.bar(result_df['USER_ID'], result_df['max_price'])
plt.xlabel("Users")
plt.ylabel("Price ($)")
plt.title('Most expensive Items Purhcased')
plt.show()
```



What is the name of the most expensive item purchased?

The most expensive item was Starbucks Iced Coffee Premium Coffee Beverage 31005.99

In [10]:

```
#What user bought the most expensive item?
query = """
SELECT ri.DESCRIPTION, MAX(ri.TOTAL_FINAL_PRICE) AS max_price
FROM receipt_items ri
JOIN brands b ON ri.BRAND_CODE = b.BRAND_CODE
GROUP BY ri.DESCRIPTION
ORDER BY max_price DESC
LIMIT 10;
"""

result_df = pd.read_sql_query(query, conn)

# Print the result
result_df
```

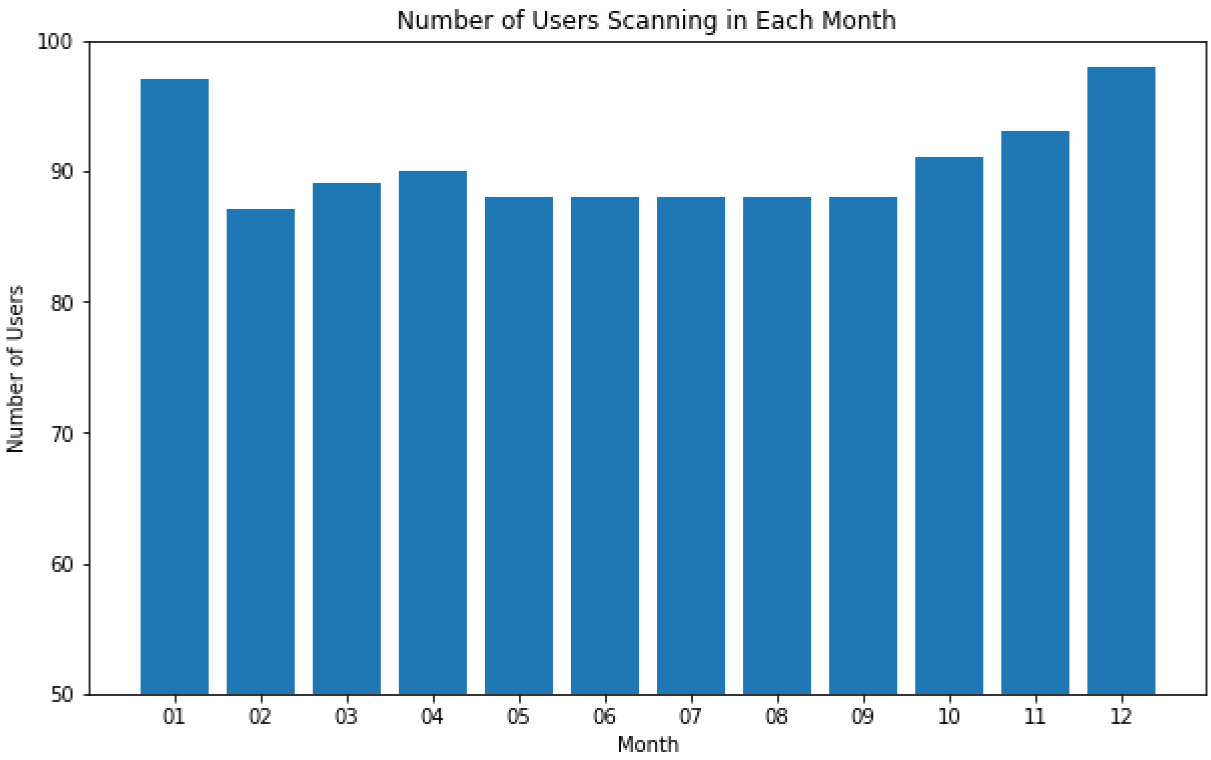
Out[10]:

	DESCRIPTION	max_price
0	Starbucks Iced Coffee Premium Coffee Beverage ...	31005.99
1	Imperial Cashew Snack Mix	1400.00
2	JIMMY DEAN DELIGHTS FROZEN TURKEY SAUSAGE EGG ...	515.38
3	Totino's Cheesy Chicken Stuffed Nachos	510.00
4	ANN N VIO AAVTNAA	493.90
5	Scott 1000 Toilet Tissue 1 Ply 1000 Count 1 Co...	467.82
6	SARA LEE	400.00
7	Scott 1000 1 Ply 1000 Cotton Toilet Tissue Uns...	359.85
8	pizza	334.23
9	Better Homes & Gardens Modern Farmhouse TV Sta...	309.00

How many users scanned in each month?

In [11]:

```
#What user bought the most expensive item?
query = """
SELECT strftime('%m', r.DATE_SCANNED) AS month, COUNT(DISTINCT r.USER_ID) AS num_users
FROM receipts r
GROUP BY month;
"""

result_df = pd.read_sql_query(query, conn)

# Print the result


# create a bar chart of the total_spent column
plt.figure(figsize=(10, 6)) # adjust the figure size
plt.bar(result_df['month'], result_df['num_users'])
plt.xlabel('Month')
plt.ylabel('Number of Users')
plt.title('Number of Users Scanning in Each Month')
plt.ylim([50, 100])
plt.show()
result_df
```



Out[11]:

	month	num_users
0	01	97
1	02	87
2	03	89
3	04	90
4	05	88
5	06	88
6	07	88
7	08	88
8	09	88
9	10	91
10	11	93
11	12	98

In [19]:

```
# Close the database connection
conn.close()
```

In [ ]:

```
```