Credit Card Fraud

Capstone project for Springboard

Muthanna Hassan

Summary

A credit card is a payment card issued by the bank, allows its users to make a purchases for their everyday spending whether the purchase was made online or in store. And at the end of the cycling month the user will have to make a payment on the credit card to avoid the fees that comes with the card, The bank usually set up a minimum payment according to the amount spent on the card, so the user won’t have to pay their credit card in full, and this feature set the credit card apart from the charge card, when on a charge card the user will have to pay the amount in full.

Project Overview

- **Background**

It’s worth to mention that the concept of using a card for purchases was described in 1887 by Edward Bellamy in his utopian novel Looking Backward. Bellamy used the term credit card eleven times in this novel, although this referred to a card for spending a guaranteed minimum income, rather than borrowing, making it more like a debit card.

- **Problem**

Now credit card dose have problems sometimes, and those problems varies from one user to another for this project we are going to discuss credit card fraud.

- **Scope of the problem**

We will use data to visualize:

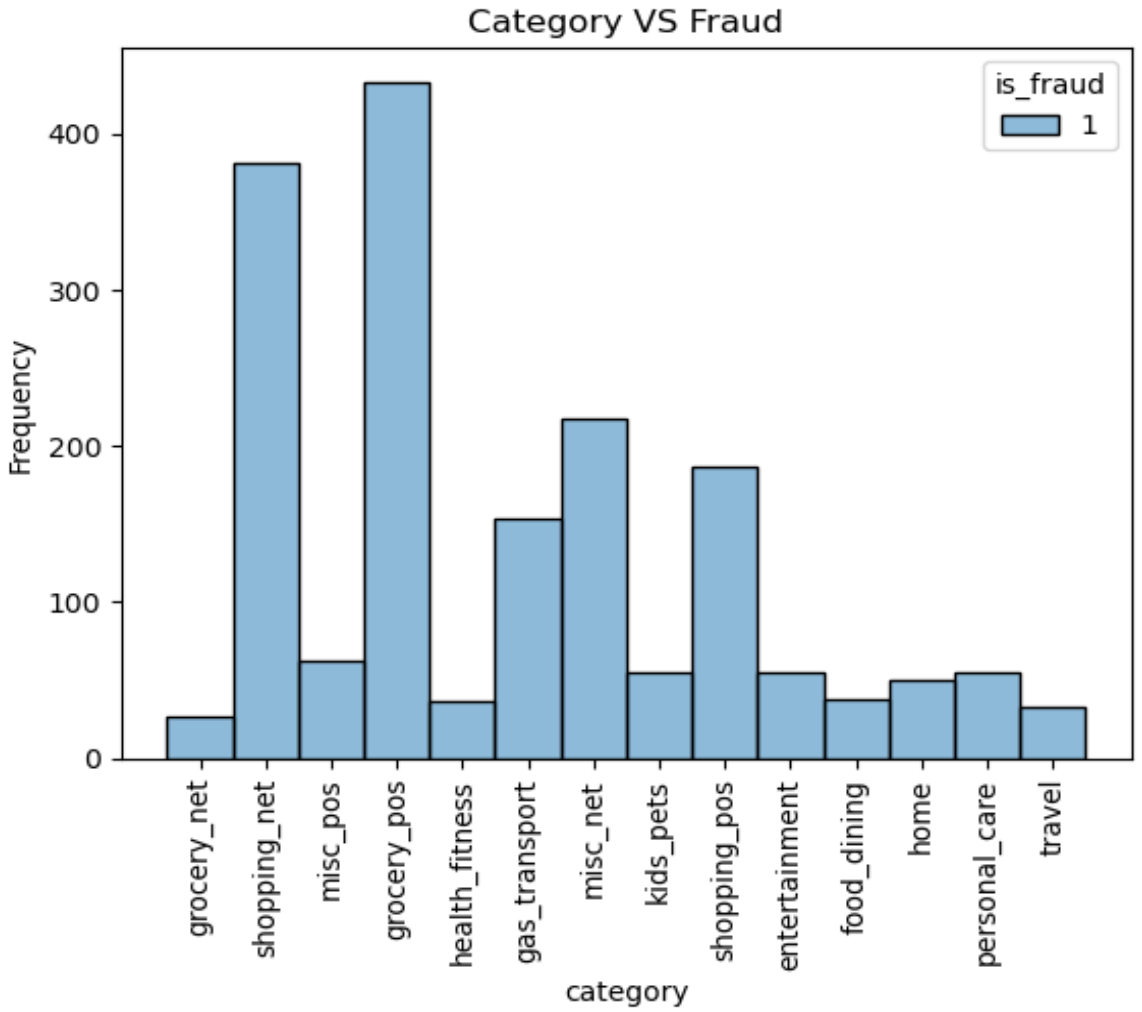
- The relationship between fraud and the purchase category.
- Do older people are more likely to have fraud on their credit card?
- What is the fraud rate by state?

- **Approach**

  - Collect & Load the data: For this, I used online resources to collect data that can help reach my target results. And then load the data I collected to a notebook to start working on answering the targeted questions.
  - Explore the data: After loading the data to my notebook, I start exploring the data to extract the columns of interest.
  - Data cleaning: here I make sure that the data I have is in the correct format, cleaned, and prepped for visualizing.

❖ Data visualizing:

To visualize the relationship between fraudulent transactions and the category of the transaction, we plot the category column in our dataset versus the fraudulent transaction's column.



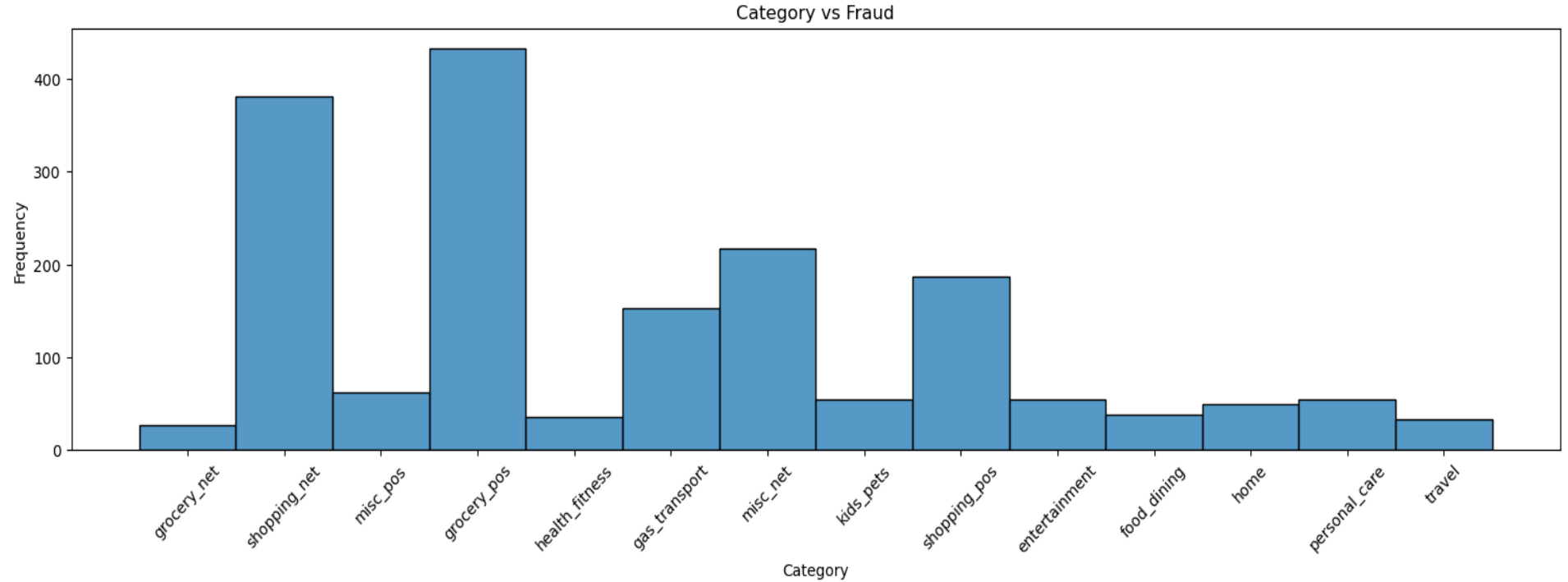
The histogram shows that:

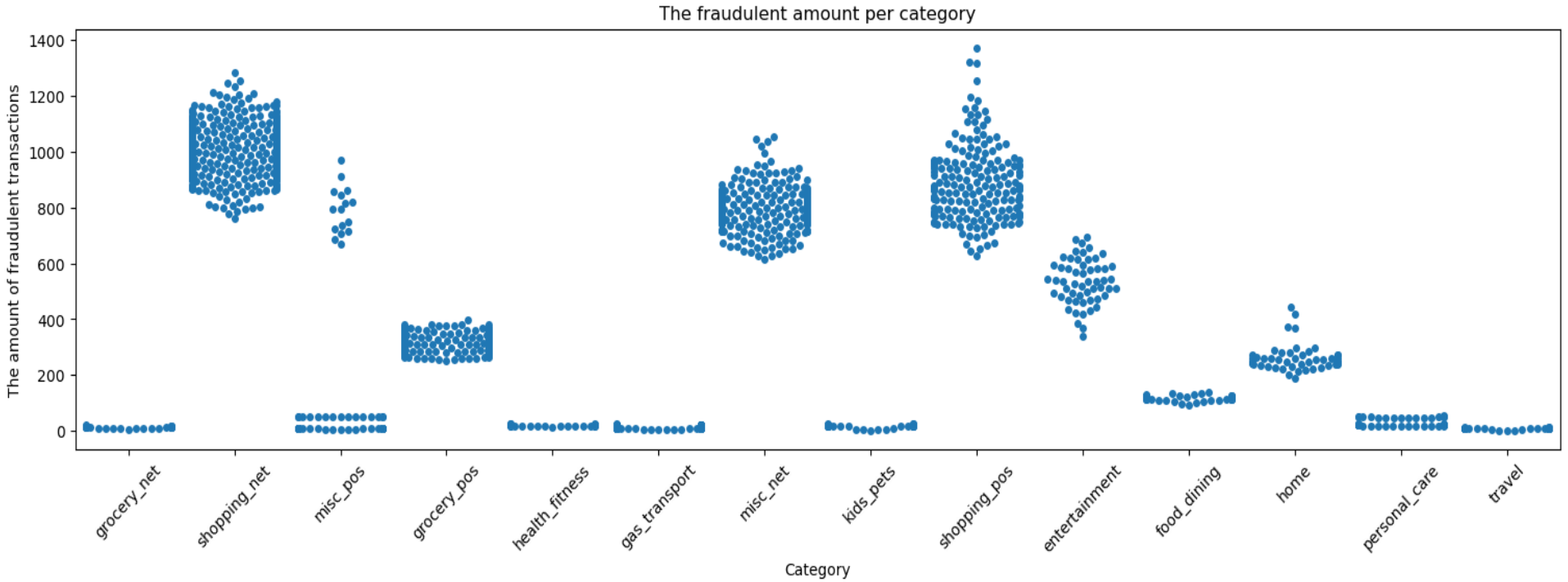
1. grocery_pos,
2. shopping_net,
3. misc_net,
4. shopping_pos
5. gas_transport

are the top five categories to have fraudulent transactions

Further analysis shows that the top five categories with the highest fraudulent amount is:

1. Shopping_pos
2. Grocery_net
3. Misc_net
4. Misc_pos
5. Entertainment

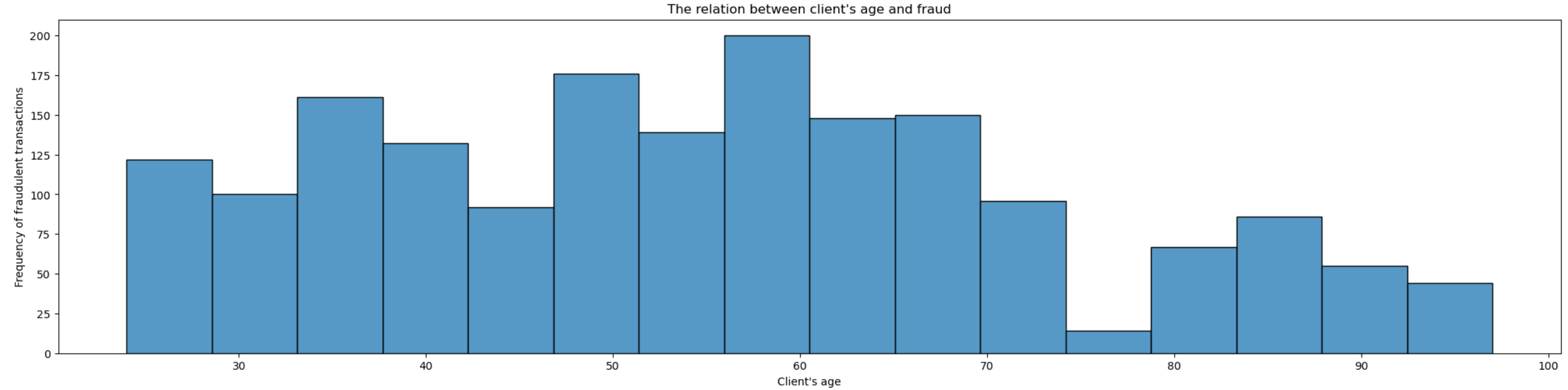


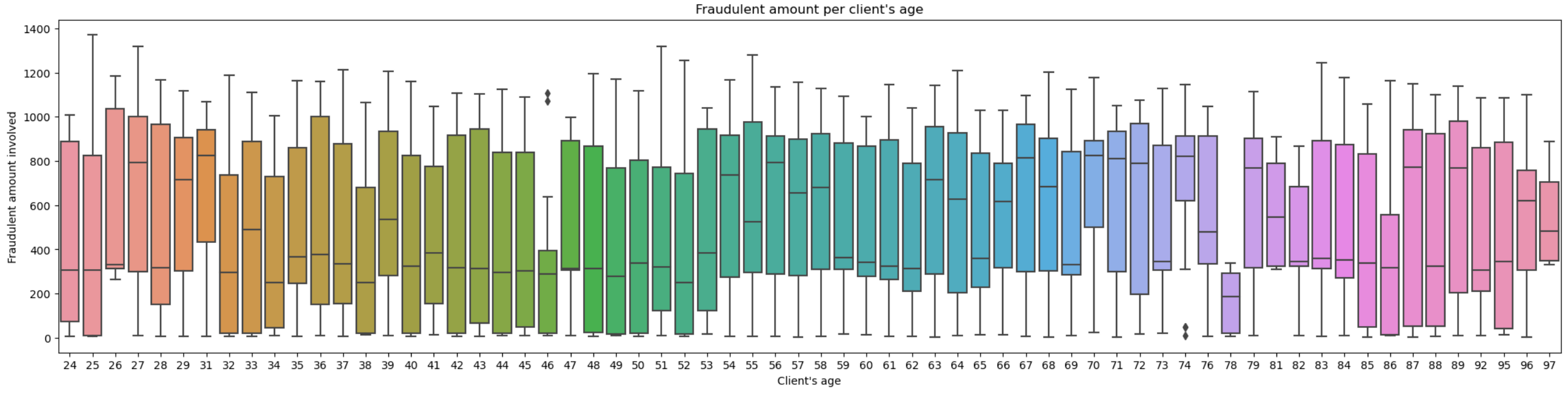


Now plotting the age column versus the fraudulent transaction's column will show us whether older people are more likely to have fraud on their account or not.

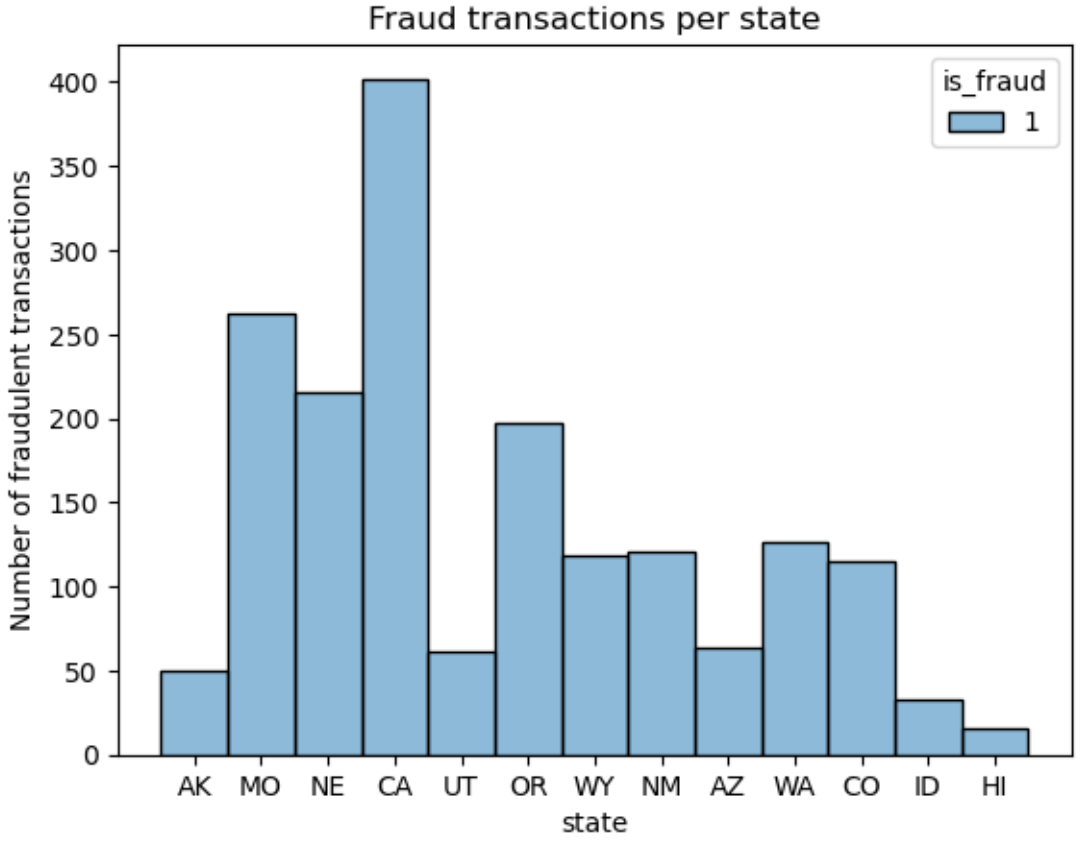
There is no evidence suggesting that older customers are disproportionately more likely to fall victim to credit card fraud. Instead, the data presented in the histogram indicates that individuals aged between 45 and 60 years old exhibit a higher likelihood of being targeted by such fraudulent activities.

In the figure below we take a closer look at the highest fraudulent amount involved per client's age.





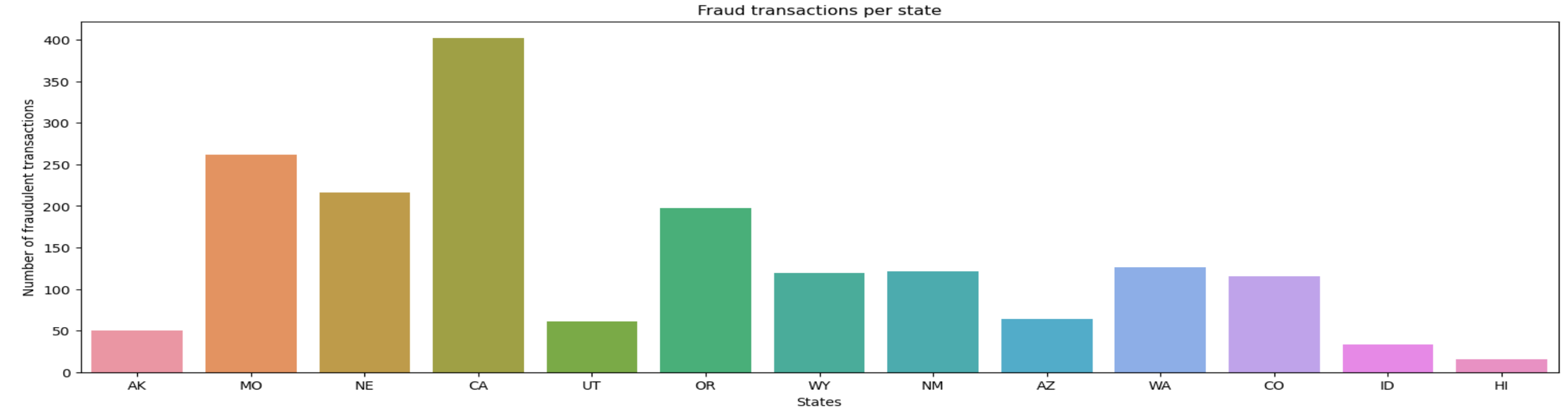
To identify the states with the highest fraudulent transaction's rate we plot the state column versus the fraudulent transaction's column.

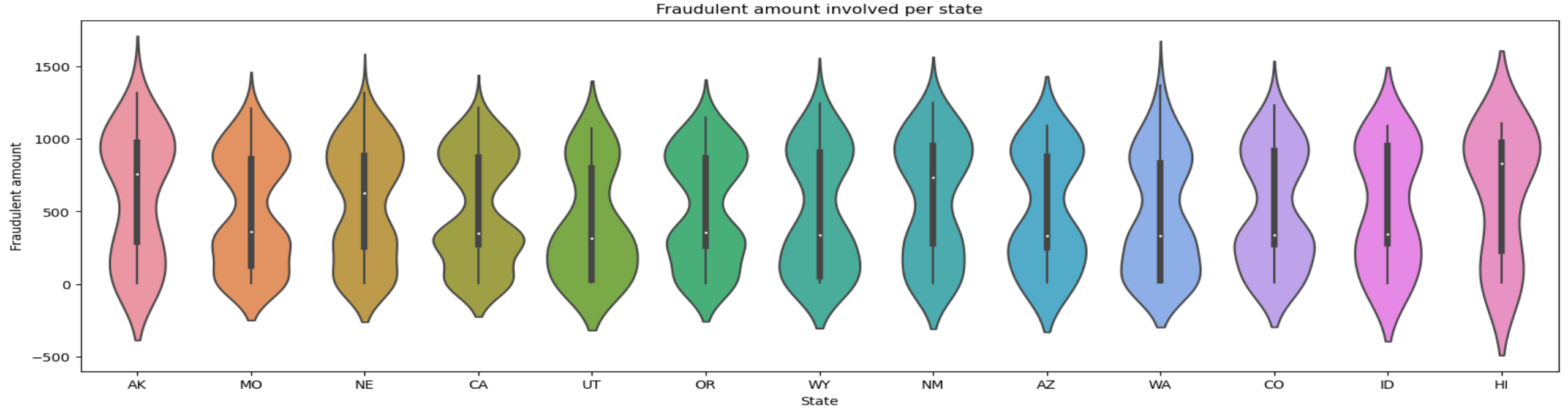


Histogram shows the top five states are:

1. CA
2. MO
3. NE
4. OR
5. WA

Below the figure represents the fraudulent amount per state





Conclusion

Fraudulent transactions can occur on all the categories. The frequency and the amount differs from one category to another.

There is no evidence suggesting that older customers are disproportionately more likely to fall victim to credit card fraud. Instead, the data presented in the histogram indicates that individuals aged between 45 and 60 years old exhibit a higher likelihood of being targeted by such fraudulent activities.

Based on our dataset, California (CA) leading the board with the highest fraudulent transactions rate, while the highest the amount goes to Alaska(AK).

Explore geographic patterns of fraud by visualizing transaction locations on a map.

Detect deviations from normal spending patterns, such as sudden large transactions or transactions in unusual locations.