adaptready

May 2, 2024

1. Data set reference link: https://www.consumerfinance.gov/data-research/consumer-complaints/#download-the-data File data source: https://files.consumerfinance.gov/ccdb/complaints.csv.zip Problem statement: Download the data from the file data source and provide possible data insights.

[6]:
```python
import pandas as pd
import matplotlib.pyplot as plt

# Load the dataset
file_path = "complaints.csv"
complaints_data = pd.read_csv(file_path)
```

```
C:\Users\Sujay\AppData\Local\Temp\ipykernel_15072\885021048.py:6: DtypeWarning:
Columns (16) have mixed types. Specify dtype option on import or set
low_memory=False.
  complaints_data = pd.read_csv(file_path)
```

[7]:
```python
# Explore the data
print("Dataset shape:", complaints_data.shape)
print("Columns:", complaints_data.columns)
print("First few rows:")
print(complaints_data.head())
```

```
Dataset shape: (5134967, 18)
Columns: Index(['Date received', 'Product', 'Sub-product', 'Issue', 'Sub-issue',
       'Consumer complaint narrative', 'Company public response', 'Company',
       'State', 'ZIP code', 'Tags', 'Consumer consent provided?',
       'Submitted via', 'Date sent to company', 'Company response to consumer',
       'Timely response?', 'Consumer disputed?', 'Complaint ID'],
      dtype='object')
First few rows:
  Date received                                            Product  \
0    2024-01-23  Credit reporting or other personal consumer re…
1    2024-01-24  Credit reporting or other personal consumer re…
2    2024-01-24  Credit reporting or other personal consumer re…
3    2024-01-23  Credit reporting or other personal consumer re…
4    2024-01-23  Credit reporting or other personal consumer re…

        Sub-product                                 Issue  \
0  Credit reporting  Incorrect information on your report
1  Credit reporting  Incorrect information on your report
2  Credit reporting           Improper use of your report
3  Credit reporting           Improper use of your report
4  Credit reporting           Improper use of your report

                                           Sub-issue  \
0              Information belongs to someone else
1              Information belongs to someone else
2  Credit inquiries on your report that you don't…
3      Reporting company used your report improperly
4      Reporting company used your report improperly

                        Consumer complaint narrative  \
0                                                NaN
1                                                NaN
2                                                NaN
3  In accordance with the Fair Credit Reporting a…
4  I have observed several deviations from mandat…

                             Company public response  \
0  Company has responded to the consumer and the …
1  Company has responded to the consumer and the …
2  Company has responded to the consumer and the …
3  Company has responded to the consumer and the …
4  Company has responded to the consumer and the …

                                  Company State ZIP code Tags  \
0  TRANSUNION INTERMEDIATE HOLDINGS, INC.    ME    04005  NaN
1  TRANSUNION INTERMEDIATE HOLDINGS, INC.    FL    33311  NaN
2  TRANSUNION INTERMEDIATE HOLDINGS, INC.    PA    175XX  NaN
3  TRANSUNION INTERMEDIATE HOLDINGS, INC.    TX    79907  NaN
4  TRANSUNION INTERMEDIATE HOLDINGS, INC.    NY    10075  NaN

  Consumer consent provided? Submitted via Date sent to company  \
0       Consent not provided           Web           2024-01-23
1                      Other           Web           2024-01-24
2                      Other           Web           2024-01-24
3           Consent provided           Web           2024-01-23
4           Consent provided           Web           2024-01-23

      Company response to consumer Timely response? Consumer disputed?  \
0  Closed with non-monetary relief              Yes                NaN
1  Closed with non-monetary relief              Yes                NaN
2  Closed with non-monetary relief              Yes                NaN
3  Closed with non-monetary relief              Yes                NaN
4  Closed with non-monetary relief              Yes                NaN
```

```
   Complaint ID
0       8206605
1       8211390
2       8211362
3       8210433
4       8209430
```

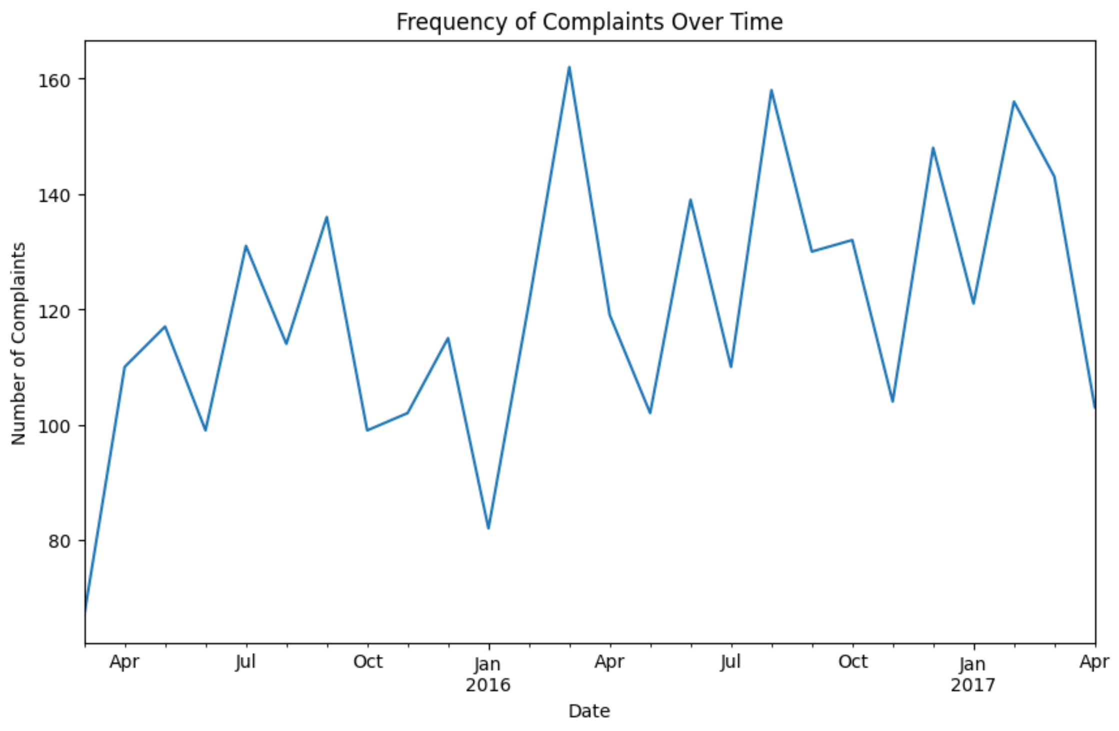
[8]:
```
# Data cleaning
# Handling missing values
complaints_data.dropna(inplace=True)
```

[13]:
```
# Data analysis
# Frequency of complaints over time
complaints_data['Date received'] = pd.to_datetime(complaints_data['Date␣
 ↪received'])
complaints_by_date = complaints_data.groupby(complaints_data['Date received'].
 ↪dt.to_period("M")).size()

# Types of complaints
top_complaints = complaints_data['Product'].value_counts().head(10)
print(top_complaints)

# Geographical analysis
top_states = complaints_data['State'].value_counts().head(10)
print(top_states)

# Response time analysis
complaints_data['Timely response?'] = complaints_data['Timely response?'].
 ↪apply(lambda x: 1 if x == 'Yes' else 0)
response_rate = complaints_data['Timely response?'].mean()
print(response_rate)

# Complaint resolution
resolution_status = complaints_data['Consumer disputed?'].value_counts()
print(resolution_status)
```

```
Product
Debt collection    2983
Student loan        137
Name: count, dtype: int64
State
CA    395
TX    310
FL    280
GA    179
VA    137
NY    110
```

```
NC    107
MD    106
OH     97
AZ     91
Name: count, dtype: int64
0.0
Consumer disputed?
No     2454
Yes     666
Name: count, dtype: int64
```

[10]:
```python
# Plot frequency of complaints over time
plt.figure(figsize=(10, 6))
complaints_by_date.plot(kind='line')
plt.title('Frequency of Complaints Over Time')
plt.xlabel('Date')
plt.ylabel('Number of Complaints')
plt.show()
```



2. Given an unsorted array of integers, find the length of the longest continuous increasing subsequence (subarray). Example 1: Input: [1,3,5,4,7] Output: 3 Example 2: Input: [2,2,2,2,2] Output: 1

[16]:
```python
def findLengthOfLCIS(nums):
    if not nums:
        return 0

    max_length = 1
    current_length = 1

    for i in range(1, len(nums)):
        if nums[i] > nums[i - 1]:
            current_length += 1
            max_length = max(max_length, current_length)
        else:
            current_length = 1

    return max_length

# Example usage:
nums_str = input("Enter the array of integers separated by spaces: ")
nums = list(map(int, nums_str.split()))

output = findLengthOfLCIS(nums)
print("Length of the longest continuous increasing subsequence:", output)
```

```
Length of the longest continuous increasing subsequence: 3
```

3. Given a list of non negative integers, arrange them such that they form the largest number. Example 1: Input: [10,2] Output: "210" Example 2: Input: [3,30,34,5,9] Output: "9534330"

[18]:
```python
from functools import cmp_to_key

def largestNumber(nums):
    # Custom sorting function
    def compare(a, b):
        return int(b + a) - int(a + b)

    # Convert integers to strings for comparison
    nums_str = [str(num) for num in nums]

    # Sort the numbers using the custom comparison function
    nums_str.sort(key=cmp_to_key(compare))

    # Concatenate the sorted numbers to form the largest number
    largest_num = ''.join(nums_str)

    # Remove leading zeros if any
    return largest_num.lstrip('0') or '0'
```

```
#Example usage:
nums_str = input("Enter the list of non-negative integers separated by spaces:␣
↪")
nums = list(map(int, nums_str.split()))


output = largestNumber(nums)
print("Largest number formed:", output)
```

```
Largest number formed: 210
```

4. Store all the “servlet-name”, and “servlet-class” to a csv file from the attached sample_json.json file using Python.

[22]:
```
import json
import csv

# Read the JSON file
with open("DT A1 sample_json (1) (1).json", "r") as json_file:
    data = json.load(json_file)

# Extract "servlet-name" and "servlet-class" pairs
servlets = data["web-app"]["servlet"]

# Write the extracted data to a CSV file
with open("servlets.csv", "w", newline="") as csv_file:
    writer = csv.writer(csv_file)
    # Write header
    writer.writerow(["servlet-name", "servlet-class"])
    # Write data
    for servlet in servlets:
        writer.writerow([servlet["servlet-name"], servlet["servlet-class"]])

print("Data successfully written to servlets.csv")
```

```
Data successfully written to servlets.csv
```