```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import datetime as dt
import warnings
warnings.filterwarnings('ignore')

data = pd.read_csv("Electoral Bonds clean.csv")

data.head()
```

```
   Reference No  (URN) Journal Date Purchase Date Expiry Date  \
0         1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
1         1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
2         1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
3         1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
4         1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19

        Purchaser Name Prefix  Bond Number Denominations  Issue Branch
Code  \
0  A B C INDIA LIMITED     TL        11448     10,00,000
1
1  A B C INDIA LIMITED     TL        11447     10,00,000
1
2  A B C INDIA LIMITED     TL        11441     10,00,000
1
3  A B C INDIA LIMITED     OL         1113      1,00,000
1
4  A B C INDIA LIMITED     OL         1118      1,00,000
1

   Issue Teller Status Date of Encashment         Political Party  \
0       5899230   Paid          25-Apr-19  BHARATIYA JANATA PARTY
1       5899230   Paid          25-Apr-19  BHARATIYA JANATA PARTY
2       5899230   Paid          25-Apr-19  BHARATIYA JANATA PARTY
3       5899230   Paid          25-Apr-19  BHARATIYA JANATA PARTY
4       5899230   Paid          25-Apr-19  BHARATIYA JANATA PARTY

  Political Party Account no.  Pay Branch Code  Pay Teller
0                 *******8244              691     3300196
1                 *******8244              691     3300196
2                 *******8244              691     3300196
3                 *******8244              691     3300196
4                 *******8244              691     3300196
```

```
data.shape
```

```
(18741, 16)
```

```
data.describe()
```

```
       Reference No  (URN)   Bond Number  Issue Branch Code  Issue
Teller  \
count         1.874100e+04  18741.000000       18741.000000
1.874100e+04
mean          4.803323e+20  12161.144283         480.130356
5.903193e+06
std           3.949056e+20   6499.960698         394.905865
1.820633e+06
min           1.201900e+18     10.000000           1.000000
1.013030e+06
25%           1.202310e+18   8313.000000           1.000000
5.054982e+06
50%           5.092020e+20  12347.000000         509.000000
6.405134e+06
75%           8.132020e+20  14764.000000         813.000000
7.273126e+06
max           1.355200e+21  71548.000000        1355.000000
8.492239e+06

       Pay Branch Code    Pay Teller
count     18741.000000  1.874100e+04
mean        550.911424  5.439590e+06
std         305.779107  1.951774e+06
min           1.000000  1.498450e+05
25%         300.000000  3.490777e+06
50%         691.000000  5.882354e+06
75%         691.000000  7.516991e+06
max        2295.000000  8.212066e+06

data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 18741 entries, 0 to 18740
Data columns (total 16 columns):
 #   Column                        Non-Null Count  Dtype
---  ------                        --------------  -----
 0   Reference No  (URN)           18741 non-null  float64
 1   Journal Date                  18741 non-null  object
 2   Purchase Date                 18741 non-null  object
 3   Expiry Date                   18741 non-null  object
 4   Purchaser Name                18741 non-null  object
 5   Prefix                        18741 non-null  object
 6   Bond Number                   18741 non-null  int64
 7   Denominations                 18741 non-null  object
 8   Issue Branch Code             18741 non-null  int64
 9   Issue Teller                  18741 non-null  int64
 10  Status                        18741 non-null  object
 11  Date of Encashment            18741 non-null  object
 12  Political Party               18741 non-null  object
 13  Political Party Account no.   18741 non-null  object
```

```
 14  Pay Branch Code              18741 non-null  int64
 15  Pay Teller                   18741 non-null  int64
dtypes: float64(1), int64(5), object(10)
memory usage: 2.3+ MB
```

```
data.isnull().sum()
```

```
Reference No  (URN)             0
Journal Date                    0
Purchase Date                   0
Expiry Date                     0
Purchaser Name                  0
Prefix                          0
Bond Number                     0
Denominations                   0
Issue Branch Code               0
Issue Teller                    0
Status                          0
Date of Encashment              0
Political Party                 0
Political Party Account no.     0
Pay Branch Code                 0
Pay Teller                      0
dtype: int64
```

```
# companies that purchased electoral bonds
num_unique_companies = data['Purchaser Name'].nunique()
print("Total Number of companies that purchased electoral bonds:",
num_unique_companies)
```

```
Total Number of companies that purchased electoral bonds: 1297
```

```
# Check for missing or non-numeric values in 'Denomination' column
non_numeric_values = data[pd.to_numeric(data['Denominations'],
errors='coerce').isnull()]
non_numeric_values
```

```
       Reference No  (URN) Journal Date Purchase Date Expiry Date  \
0             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
1             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
2             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
3             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
4             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
...                    ...          ...           ...         ...
18736         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18737         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18738         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18739         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18740         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24

                      Purchaser Name Prefix  Bond Number
```

```
Denominations  \
0                 A B C INDIA LIMITED     TL        11448
10,00,000
1                 A B C INDIA LIMITED     TL        11447
10,00,000
2                 A B C INDIA LIMITED     TL        11441
10,00,000
3                 A B C INDIA LIMITED     OL         1113
1,00,000
4                 A B C INDIA LIMITED     OL         1118
1,00,000
...                               ...    ...          ...            ..
.
18736  WESTWELL GASES PRIVATE LIMITED     OC        15695
1,00,00,000
18737  WESTWELL GASES PRIVATE LIMITED     OC        15693
1,00,00,000
18738  WESTWELL GASES PRIVATE LIMITED     OC        15697
1,00,00,000
18739  WESTWELL GASES PRIVATE LIMITED     OC        17803
1,00,00,000
18740  WESTWELL GASES PRIVATE LIMITED     OC        15691
1,00,00,000

       Issue Branch Code  Issue Teller Status Date of Encashment  \
0                      1       5899230   Paid          25-Apr-19
1                      1       5899230   Paid          25-Apr-19
2                      1       5899230   Paid          25-Apr-19
3                      1       5899230   Paid          25-Apr-19
4                      1       5899230   Paid          25-Apr-19
...                  ...           ...    ...                ...
18736                  1       5898161   Paid          23-Jan-24
18737                  1       5898161   Paid          23-Jan-24
18738                  1       5898161   Paid          23-Jan-24
18739                  1       5898161   Paid          23-Jan-24
18740                  1       5898161   Paid          23-Jan-24

                      Political Party Political Party Account no.  \
0               BHARATIYA JANATA PARTY                  *******8244
1               BHARATIYA JANATA PARTY                  *******8244
2               BHARATIYA JANATA PARTY                  *******8244
3               BHARATIYA JANATA PARTY                  *******8244
4               BHARATIYA JANATA PARTY                  *******8244
...                                ...                         ...
18736  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18737  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18738  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18739  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18740  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
```

```
       Pay Branch Code  Pay Teller
0                  691     3300196
1                  691     3300196
2                  691     3300196
3                  691     3300196
4                  691     3300196
...                ...         ...
18736              800     1011942
18737              800     1011942
18738              800     1011942
18739              800     1011942
18740              800     1011942

[18741 rows x 16 columns]
```

```
# Print non-numeric values
print("Non-numeric values in 'Denomination' column:")
print(non_numeric_values)
```

```
Non-numeric values in 'Denomination' column:
       Reference No  (URN) Journal Date Purchase Date Expiry Date  \
0             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
1             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
2             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
3             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
4             1.201900e+18    12-Apr-19     12-Apr-19   26-Apr-19
...                    ...          ...           ...         ...
18736         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18737         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18738         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18739         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24
18740         1.202400e+18    11-Jan-24     11-Jan-24   25-Jan-24

                      Purchaser Name Prefix  Bond Number
Denominations  \
0                  A B C INDIA LIMITED     TL        11448
10,00,000
1                  A B C INDIA LIMITED     TL        11447
10,00,000
2                  A B C INDIA LIMITED     TL        11441
10,00,000
3                  A B C INDIA LIMITED     OL         1113
1,00,000
4                  A B C INDIA LIMITED     OL         1118
1,00,000
...                                ...    ...          ...           ..
.
18736  WESTWELL GASES PRIVATE LIMITED     OC        15695
1,00,00,000
18737  WESTWELL GASES PRIVATE LIMITED     OC        15693
```

```
1,00,00,000
18738  WESTWELL GASES PRIVATE LIMITED     OC        15697
1,00,00,000
18739  WESTWELL GASES PRIVATE LIMITED     OC        17803
1,00,00,000
18740  WESTWELL GASES PRIVATE LIMITED     OC        15691
1,00,00,000

       Issue Branch Code  Issue Teller Status Date of Encashment  \
0                      1       5899230   Paid          25-Apr-19
1                      1       5899230   Paid          25-Apr-19
2                      1       5899230   Paid          25-Apr-19
3                      1       5899230   Paid          25-Apr-19
4                      1       5899230   Paid          25-Apr-19
...                  ...           ...    ...                ...
18736                  1       5898161   Paid          23-Jan-24
18737                  1       5898161   Paid          23-Jan-24
18738                  1       5898161   Paid          23-Jan-24
18739                  1       5898161   Paid          23-Jan-24
18740                  1       5898161   Paid          23-Jan-24

                      Political Party Political Party Account no.  \
0               BHARATIYA JANATA PARTY                  *******8244
1               BHARATIYA JANATA PARTY                  *******8244
2               BHARATIYA JANATA PARTY                  *******8244
3               BHARATIYA JANATA PARTY                  *******8244
4               BHARATIYA JANATA PARTY                  *******8244
...                                ...                         ...
18736  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18737  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18738  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18739  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935
18740  DRAVIDA MUNNETRA KAZHAGAM (DMK)                  *******8935

       Pay Branch Code  Pay Teller
0                  691     3300196
1                  691     3300196
2                  691     3300196
3                  691     3300196
4                  691     3300196
...                ...         ...
18736              800     1011942
18737              800     1011942
18738              800     1011942
18739              800     1011942
18740              800     1011942

[18741 rows x 16 columns]
```

```
# Check for missing values
missing_values = data[data['Denominations'].isnull()]
print(missing_values)
```

```
Empty DataFrame
Columns: [Reference No  (URN), Journal Date, Purchase Date, Expiry
Date, Purchaser Name, Prefix, Bond Number, Denominations, Issue Branch
Code, Issue Teller, Status, Date of Encashment, Political Party,
Political Party Account no., Pay Branch Code, Pay Teller]
Index: []
```

```
# there is no null values in denominations

data['Denominations']
```

```
0          10,00,000
1          10,00,000
2          10,00,000
3           1,00,000
4           1,00,000
            ...
18736    1,00,00,000
18737    1,00,00,000
18738    1,00,00,000
18739    1,00,00,000
18740    1,00,00,000
Name: Denominations, Length: 18741, dtype: object
```

```
# Remove commas from 'Denomination' column and convert to numeric type
data['Denominations'] =
pd.to_numeric(data['Denominations'].str.replace(',', ''),
errors='coerce')
# Sum the 'Denomination' column
total_amount_purchased = data['Denominations'].sum()
# Print the total sum
print("Total amount of bonds purchased in Crore:",
total_amount_purchased)
```

```
Total amount of bonds purchased in Crore: 121458783000
```

```
partys_fund = data.groupby('Political Party')
['Denominations'].value_counts()
partys_fund
```

```
Political Party
Denominations
AAM AADMI PARTY                                                  100000
95
                                                                 1000000
93
                                                                 10000000
```

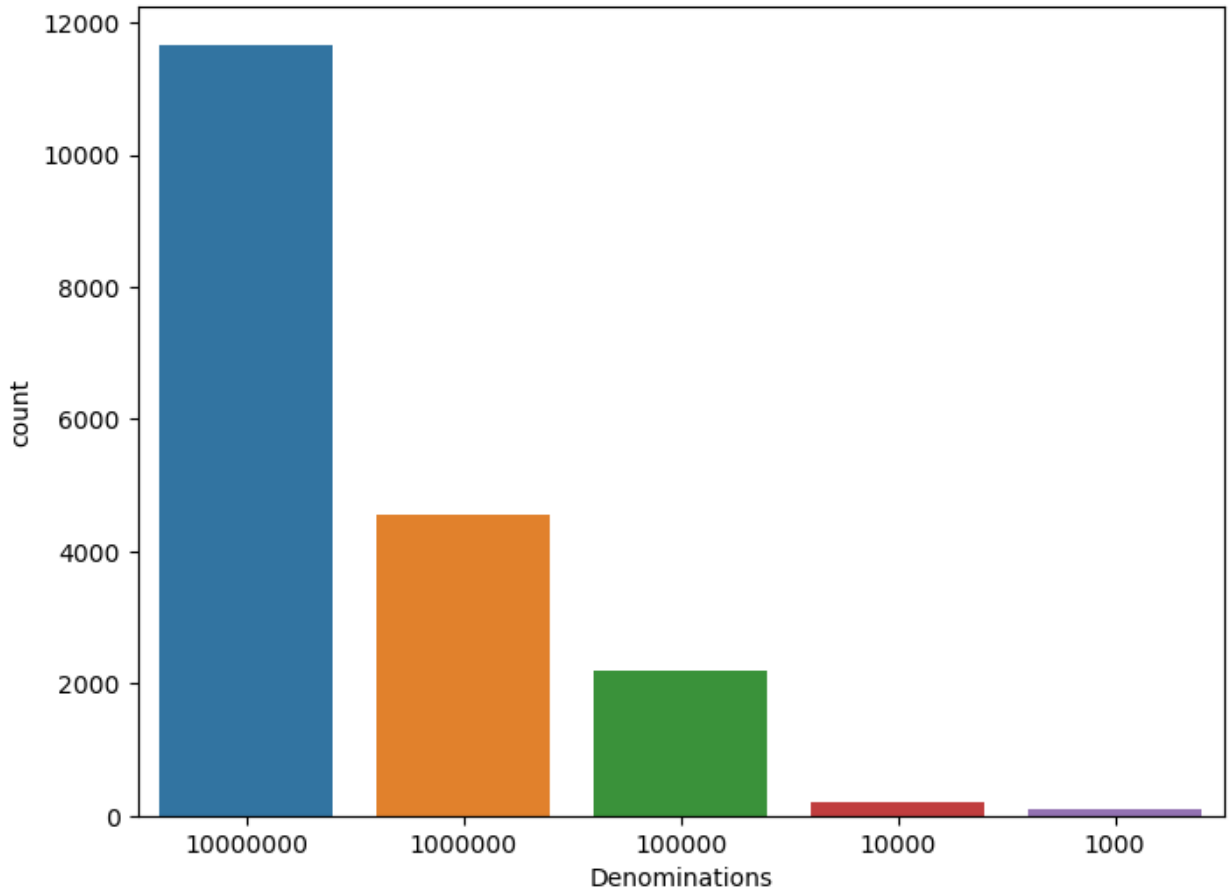
```
55
ADYAKSHA SAMAJVADI PARTY                                                10000000
13
                                                                        1000000
2

...
TELUGU DESAM PARTY                                                      1000000
34
                                                                        100000
18
YSR  CONGRESS PARTY  (YUVAJANA SRAMIKA RYTHU CONGRESS PARTY)  10000000
321
                                                                        1000000
72
                                                                        100000
55
Name: count, Length: 68, dtype: int64


fig = plt.figure(figsize=(8,6))

sns.countplot(x= 'Denominations', data = data, order =
data.Denominations.value_counts().index[:10])

<Axes: xlabel='Denominations', ylabel='count'>
```




```
top10 =  data.groupby('Political Party')
['Denominations'].sum().sort_values(ascending = False).head(10)
# top 10 purchases
top10
```

```
Political Party
BHARATIYA JANATA PARTY
55942011000
ALL INDIA TRINAMOOL CONGRESS
15925214000
PRESIDENT, ALL INDIA CONGRESS COMMITTEE
13510945000
BHARAT RASHTRA SAMITHI
11911599000
BIJU JANATA DAL
7755000000
DRAVIDA MUNNETRA KAZHAGAM (DMK)
6320000000
YSR  CONGRESS PARTY  (YUVAJANA SRAMIKA RYTHU CONGRESS PARTY)
3287500000
TELUGU DESAM PARTY
2115800000
```

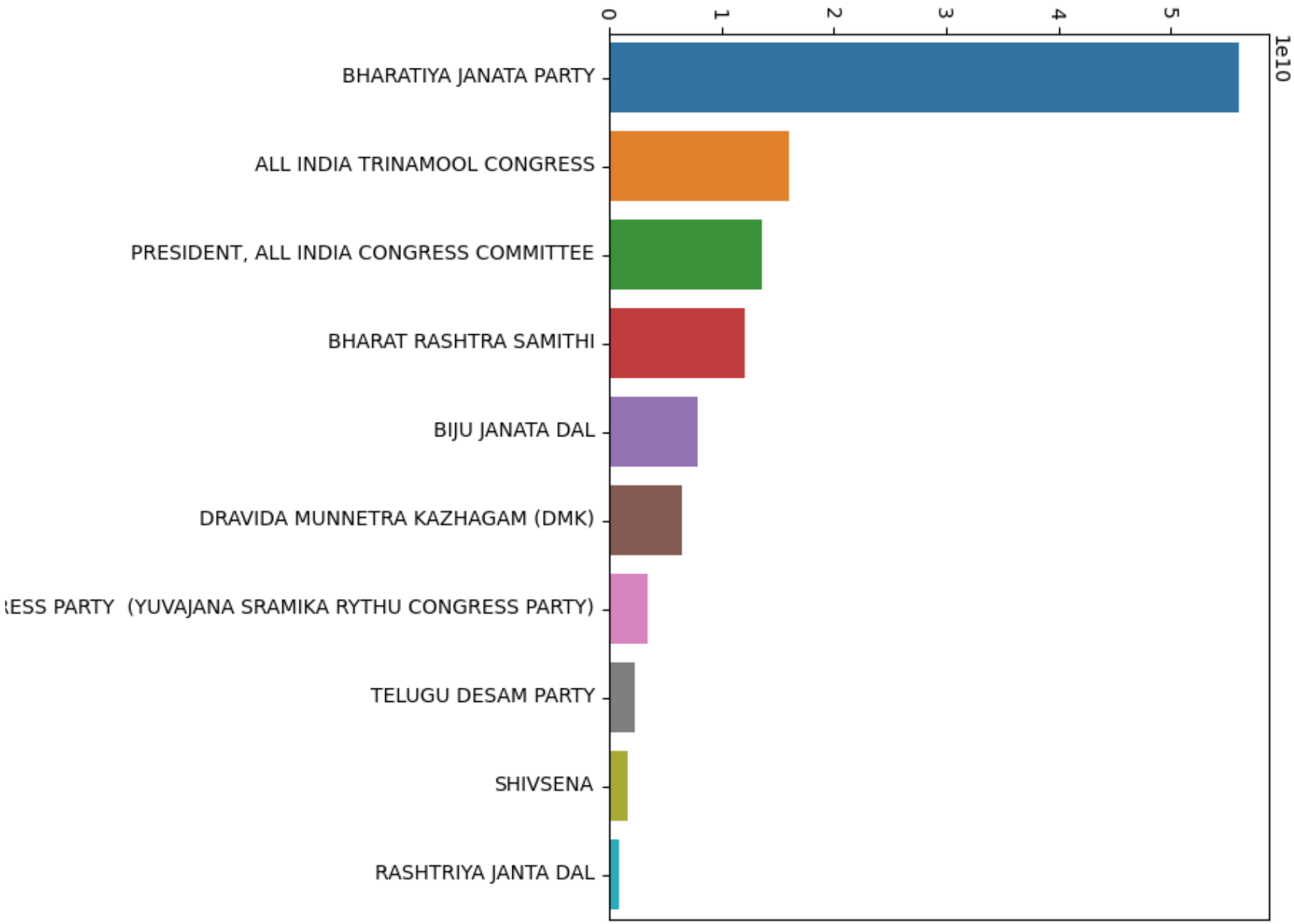
```
SHIVSENA
1524514000
RASHTRIYA JANTA DAL
725000000
Name: Denominations, dtype: int64
```

```
top10.values
```

```
array([55942011000, 15925214000, 13510945000, 11911599000,
7755000000,
        6320000000,  3287500000,  2115800000,  1524514000,
725000000],
      dtype=int64)
```

```
plt.figure(figsize=(8, 6))
sns.barplot(x = top10.index , y = top10.values)
plt.xticks(rotation = 90)
```

```
(array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9]),
 [Text(0, 0, 'BHARATIYA JANATA PARTY'),
  Text(1, 0, 'ALL INDIA TRINAMOOL CONGRESS'),
  Text(2, 0, 'PRESIDENT, ALL INDIA CONGRESS COMMITTEE'),
  Text(3, 0, 'BHARAT RASHTRA SAMITHI'),
  Text(4, 0, 'BIJU JANATA DAL'),
  Text(5, 0, 'DRAVIDA MUNNETRA KAZHAGAM (DMK)'),
  Text(6, 0, 'YSR  CONGRESS PARTY  (YUVAJANA SRAMIKA RYTHU CONGRESS
PARTY)'),
  Text(7, 0, 'TELUGU DESAM PARTY'),
  Text(8, 0, 'SHIVSENA'),
  Text(9, 0, 'RASHTRIYA JANTA DAL')])
```


0
1
2
3
4
5
1e10
BHARATIYA JANATA PARTY
ALL INDIA TRINAMOOL CONGRESS
PRESIDENT, ALL INDIA CONGRESS COMMITTEE
BHARAT RASHTRA SAMITHI
BIJU JANATA DAL
DRAVIDA MUNNETRA KAZHAGAM (DMK)
ESS PARTY (YUVAJANA SRAMIKA RYTHU CONGRESS PARTY)
TELUGU DESAM PARTY
SHIVSENA
RASHTRIYA JANTA DAL

```
# Top 5 purchase based on sum of purchases(purchaser name)
top5 =  data.groupby('Purchaser Name')
['Denominations'].sum().sort_values(ascending = False).head(5)

plt.figure(figsize=(5, 5))
plt.pie(top5, labels = top5.index)
plt.title('Top 5 Largest Purchasers \n\n')
plt.axis('equal')
```

```
(-1.099999971602679,
 1.0999999986477467,
 -1.0999996185459782,
 1.0999956639316644)
```