

```
In [ ]: # Goal :- The goal is to provide the insights into the transactions trends , dev  
# uncover deeper insights.
```

```
In [1]: import pandas as pd  
import numpy as np  
file_path = "C:/Users/anush/Downloads/phonepephone_pay_case_study.xlsx"  
state_txn_users = pd.read_excel(file_path, sheet_name="State_Txn and Users")  
state_txn_split = pd.read_excel(file_path, sheet_name="State_TxnSplit")  
state_device_data = pd.read_excel(file_path, sheet_name="State_DeviceData")  
district_txn_users = pd.read_excel(file_path, sheet_name="District_Txn and Users")  
district_demo = pd.read_excel(file_path, sheet_name="District Demographics")
```

```
In [3]: state_txn_users.shape
```

```
Out[3]: (504, 8)
```

```
In [ ]: import pandas as pd  
import numpy as np  
file_path = "C:/Users/anush/Downloads/Interview Dataset.xlsx"  
df = pd.read_excel(file_path)
```

## Understanding the Data

```
In [2]: # 1. Load the State_Txn and Users dataset and display its first 5 rows.  
state_txn_users.head()
```

Out[2]:

	State	Year	Quarter	Transactions	Amount (INR)	ATV (INR)	Registered Users	App Open
0	Andaman & Nicobar Islands	2018	1	6658	1.463176e+07	2197.621091	6740	
1	Andaman & Nicobar Islands	2018	2	11340	2.833854e+07	2498.989022	9405	
2	Andaman & Nicobar Islands	2018	3	16265	5.555747e+07	3415.768284	12149	
3	Andaman & Nicobar Islands	2018	4	23758	9.054834e+07	3811.277720	15222	
4	Andaman & Nicobar Islands	2019	1	30486	1.022997e+08	3355.630147	18596	

```
In [3]: # 2. Load the State_TxnSplit dataset and display its bottom 10 rows.
```

```
state_txn_split.tail(10)
```

Out[3]:

	State	Year	Quarter	Transaction Type	Transactions	Amount (INR)	ATV (INR)
2504	West Bengal	2021	1	Peer-to-peer payments	53869075	2.022402e+11	3754.292226
2505	West Bengal	2021	1	Merchant payments	37143701	2.891834e+10	778.553104
2506	West Bengal	2021	1	Recharge & bill payments	26673733	1.133967e+10	425.124820
2507	West Bengal	2021	1	Financial Services	166727	1.754458e+08	1052.293941
2508	West Bengal	2021	1	Others	400816	2.635025e+08	657.415236
2509	West Bengal	2021	2	Peer-to-peer payments	64661051	2.308123e+11	3569.572026
2510	West Bengal	2021	2	Merchant payments	41696787	3.478787e+10	834.305703
2511	West Bengal	2021	2	Recharge & bill payments	34799709	1.333145e+10	383.090958
2512	West Bengal	2021	2	Financial Services	190537	1.864665e+08	978.636630
2513	West Bengal	2021	2	Others	549353	3.167447e+08	576.577748

In [4]:

```
# 3. Load the State_DeviceData dataset and display 10 rows from the middle of the dataset
mid = len(state_device_data)//2
state_device_data.iloc[mid-5:mid+5]
```

Out[4]:

	State	Year	Quarter	Brand	Registered Users	Percentage
2767	Ladakh	2021	2	OnePlus	1741	0.023198
2768	Ladakh	2021	2	Motorola	922	0.012285
2769	Ladakh	2021	2	Huawei	894	0.011912
2770	Ladakh	2021	2	Lenovo	490	0.006529
2771	Ladakh	2021	2	Others	2610	0.034778
2772	Lakshadweep	2018	1	Samsung	102	0.203593
2773	Lakshadweep	2018	1	Xiaomi	100	0.199601
2774	Lakshadweep	2018	1	Vivo	67	0.133733
2775	Lakshadweep	2018	1	Oppo	56	0.111776
2776	Lakshadweep	2018	1	Huawei	25	0.049900

```
In [5]: # 4. Load the District_Txn and Users dataset and display its first 10 rows and last 10 rows
district_txn_users.head(10)
district_txn_users.tail(10)
```

Out[5]:

	<b>State</b>	<b>Year</b>	<b>Quarter</b>	<b>District</b>	<b>Code</b>	<b>Transactions</b>	<b>Amount (INR)</b>	<b>ATV (INR)</b>
<b>10238</b>	West Bengal	2021	2	Murshidabad	WB14	8602251	1.999694e+10	2324.61
<b>10239</b>	West Bengal	2021	2	Nadia	WB15	5524174	1.122758e+10	2032.44
<b>10240</b>	West Bengal	2021	2	North Twenty Four Parganas	WB16	17258291	3.041482e+10	1762.33
<b>10241</b>	West Bengal	2021	2	Paschim Bardhaman	WB17	4893774	8.731263e+09	1784.15
<b>10242</b>	West Bengal	2021	2	Paschim Medinipur	WB18	5051834	1.030351e+10	2039.55
<b>10243</b>	West Bengal	2021	2	Purba Bardhaman	WB19	3920729	7.572502e+09	1931.40
<b>10244</b>	West Bengal	2021	2	Purba Medinipur	WB20	6418522	1.515507e+10	2361.14
<b>10245</b>	West Bengal	2021	2	Purulia	WB21	1895981	2.790996e+09	1472.05
<b>10246</b>	West Bengal	2021	2	South Twenty Four Parganas	WB22	6661813	1.339853e+10	2011.24
<b>10247</b>	West Bengal	2021	2	Uttar Dinajpur	WB23	2253385	5.564221e+09	2469.27



```
In [6]: # 5. Load the District Demographics dataset and display every 10th row
district_demo.iloc[::10]
```

Out[6]:

	State	District	Headquarters	Population	Area (sq km)	Density	Code
0	Andhra Pradesh	Anantapur	Anantapur	4083315	19130.0	213	AP01
10	Andhra Pradesh	Visakhapatnam	Visakhapatnam	4288113	11161.0	384	AP10
20	Arunachal Pradesh	Lepa Rada	Basar	0	0.0	0	AR08
30	Arunachal Pradesh	Siang	Pangin	31920	2919.0	11	AR18
40	Assam	Barpeta	Barpeta	1693622	3245.0	520	AS03
...	...	...	...	...	...	...	...
700	Chandigarh	Chandigarh	Chandigarh	1055450	114.0	9258	CH01
710	Jammu & Kashmir	Jammu	Jammu	1526406	3097.0	596	JK07
720	Jammu & Kashmir	Samba	Samba	318611	913.0	318	JK17
730	Delhi	North Delhi	Sadar Bazaar	887978	59.0	14557	DL04
740	Puducherry	Puducherry	Pondicherry	950289	293.0	3232	PY03

75 rows × 8 columns



## Display basic statistics and data types for each dataset

In [2]: `state_txn_users.describe()`

Out[2]:

	Year	Quarter	Transactions	Amount (INR)	ATV (INR)	Registered Users
<b>count</b>	504.000000	504.000000	5.040000e+02	5.030000e+02	504.000000	5.040000e+02
<b>mean</b>	2019.285714	2.357143	4.074000e+07	7.083332e+10	1993.471543	4.777501e+06
<b>std</b>	1.031181	1.109971	8.228714e+07	1.440902e+11	607.464894	6.644496e+06
<b>min</b>	2018.000000	1.000000	7.780000e+02	1.928611e+06	0.000000	5.010000e+02
<b>25%</b>	2018.000000	1.000000	5.925578e+05	1.167157e+09	1598.910667	1.574202e+05
<b>50%</b>	2019.000000	2.000000	6.217487e+06	1.051605e+10	1861.380589	1.747914e+06
<b>75%</b>	2020.000000	3.000000	4.363675e+07	6.947045e+10	2259.087924	7.320945e+06
<b>max</b>	2021.000000	4.000000	5.736165e+08	1.027958e+12	3938.733850	3.966470e+07



In [9]: state\_txn\_split.describe()

Out[9]:

	Year	Quarter	Transactions	Amount (INR)	ATV (INR)
<b>count</b>	2514.000000	2514.000000	2.514000e+03	2.514000e+03	2514.000000
<b>mean</b>	2019.286794	2.358393	8.167446e+06	1.443978e+10	1349.927929
<b>std</b>	1.030807	1.109251	2.423645e+07	5.995054e+10	1534.866221
<b>min</b>	2018.000000	1.000000	2.000000e+00	3.439721e+01	17.198606
<b>25%</b>	2018.000000	1.000000	2.788075e+04	1.762412e+07	385.735827
<b>50%</b>	2019.000000	2.000000	2.687980e+05	1.901189e+08	720.940406
<b>75%</b>	2020.000000	3.000000	3.683230e+06	2.661248e+09	1352.790116
<b>max</b>	2021.000000	4.000000	2.795990e+08	8.721520e+11	7767.539936

In [10]: state\_device\_data.describe()

Out[10]:

	Year	Quarter	Registered Users	Percentage
<b>count</b>	5544.000000	5544.000000	5.544000e+03	5544.000000
<b>mean</b>	2019.285714	2.357143	4.343183e+05	0.090909
<b>std</b>	1.030250	1.108970	9.056069e+05	0.083095
<b>min</b>	2018.000000	1.000000	1.000000e+01	0.006373
<b>25%</b>	2018.000000	1.000000	8.055750e+03	0.021588
<b>50%</b>	2019.000000	2.000000	7.442250e+04	0.056914
<b>75%</b>	2020.000000	3.000000	3.978875e+05	0.143626
<b>max</b>	2021.000000	4.000000	9.764252e+06	0.478367

In [11]: district\_txn\_users.describe()

Out[11]:

	Year	Quarter	Transactions	Amount (INR)	ATV (INR)	Regist
<b>count</b>	10248.000000	10248.000000	1.024800e+04	1.024800e+04	10244.000000	1.024800e+04
<b>mean</b>	2019.285714	2.357143	2.003607e+06	3.542311e+09	1909.796545	2.349591e+09
<b>std</b>	1.030208	1.108924	9.613466e+06	1.473154e+10	600.943349	4.605978e+08
<b>min</b>	2018.000000	1.000000	0.000000e+00	0.000000e+00	84.944283	2.200000e+00
<b>25%</b>	2018.000000	1.000000	1.031418e+05	1.756668e+08	1554.589051	3.619550e+07
<b>50%</b>	2019.000000	2.000000	3.763065e+05	6.784562e+08	1863.135530	1.067640e+09
<b>75%</b>	2020.000000	3.000000	1.272815e+06	2.377256e+09	2203.083552	2.573165e+09
<b>max</b>	2021.000000	4.000000	3.487128e+08	4.444224e+11	11209.980550	1.060461e+12

In [12]: `district_demo.describe()`

Out[12]:

	Population	Area (sq km)	Density
<b>count</b>	7.420000e+02	742.000000	742.000000
<b>mean</b>	1.668555e+06	4395.373120	838.512129
<b>std</b>	1.458849e+06	4254.676124	2754.406896
<b>min</b>	0.000000e+00	0.000000	0.000000
<b>25%</b>	6.530815e+05	2039.750000	198.000000
<b>50%</b>	1.322359e+06	3402.500000	353.000000
<b>75%</b>	2.297440e+06	5432.750000	686.250000
<b>max</b>	1.008285e+07	45652.000000	36155.000000

In [13]: `state_txn_users.dtypes`

```
Out[13]: State          object
          Year         int64
          Quarter      int64
          Transactions int64
          Amount (INR) float64
          ATV (INR)    float64
          Registered Users int64
          App Opens    int64
          dtype: object
```

In [14]: `state_txn_split.dtypes`

```
Out[14]: State          object
Year           int64
Quarter        int64
Transaction Type  object
Transactions    int64
Amount (INR)    float64
ATV (INR)       float64
dtype: object
```

```
In [15]: state_device_data.dtypes
```

```
Out[15]: State          object
Year           int64
Quarter        int64
Brand          object
Registered Users  int64
Percentage     float64
dtype: object
```

```
In [16]: district_txn_users.dtypes
```

```
Out[16]: State          object
Year           int64
Quarter        int64
District        object
Code            object
Transactions    int64
Amount (INR)    float64
ATV (INR)       float64
Registered Users  int64
App Opens       int64
dtype: object
```

```
In [17]: district_demo.dtypes
```

```
Out[17]: State          object
District        object
Headquarters    object
Population      int64
Area (sq km)   float64
Density         int64
Code            object
Alternate Name  object
dtype: object
```

Check for missing values

```
In [18]: # Identify any missing values in each dataset..
state_txn_users.isnull().sum()
```

```
Out[18]: State          0
Year           0
Quarter        0
Transactions    0
Amount (INR)    1
ATV (INR)       0
Registered Users  0
App Opens       0
dtype: int64
```

```
In [19]: state_txn_users.dropna(inplace = True)
state_txn_users.isnull().sum()
```

```
Out[19]: State      0
Year       0
Quarter    0
Transactions 0
Amount (INR) 0
ATV (INR)   0
Registered Users 0
App Opens   0
dtype: int64
```

```
In [20]: district_txn_users.isnull().sum()
```

```
Out[20]: State      0
Year       0
Quarter    0
District   0
Code       28
Transactions 0
Amount (INR) 0
ATV (INR)   4
Registered Users 0
App Opens   0
dtype: int64
```

```
In [21]: district_txn_users.dropna(subset=['ATV (INR)', inplace = True)
district_txn_users.isnull().sum()
```

```
Out[21]: State      0
Year       0
Quarter    0
District   0
Code       28
Transactions 0
Amount (INR) 0
ATV (INR)   0
Registered Users 0
App Opens   0
dtype: int64
```

Create a summary

```
In [51]: # 1. Calculate the total number of states and the total number of districts.

total_states = district_demo['State'].nunique()
total_districts = district_demo['District'].nunique()

print(f" Total States: {total_states}")
print(f" Total Districts: {total_districts}")
```

Total States: 36

Total Districts: 736

```
In [22]: #Identify the state with the highest number of districts.
district_count_per_state = district_demo['State'].value_counts()
max_state = district_count_per_state.idxmax()
```

```
max_count = district_count_per_state.max()
print(f"State with highest number of districts: '{max_state}' → {max_count} dist
```

State with highest number of districts: 'Uttar Pradesh' → 75 districts

## Exploratory Data Analysis

```
In [23]: # Analyze transaction trends over the years for each state
# Calculate the total number of transactions and total transaction amount for each state
from tabulate import tabulate

yearly_trends = state_txn_users.groupby(["State", "Year"])[["Transactions", "Amount"]].sum()
print("Total Transactions & Amount by State Over the Years")
print(tabulate(yearly_trends, headers='keys', tablefmt='grid'))
```

## Total Transactions &amp; Amount by State Over the Years

	State (INR)	Year	Transactions	Amount
0	Andaman & Nicobar Islands 76e+08	2018	58021	1.890
1	Andaman & Nicobar Islands 65e+08	2019	133104	4.734
2	Andaman & Nicobar Islands 42e+09	2020	446274	1.296
3	Andaman & Nicobar Islands 85e+09	2021	586166	1.682
4	Andhra Pradesh 72e+11	2018	77779112	1.220
5	Andhra Pradesh 91e+11	2019	297180254	5.377
6	Andhra Pradesh 25e+12	2020	763616699	1.677
7	Andhra Pradesh 37e+11	2021	352767134	8.507
8	Arunachal Pradesh 12e+09	2018	435229	1.127
9	Arunachal Pradesh 82e+09	2019	1314871	3.465
10	Arunachal Pradesh 68e+09	2020	3547905	9.388
11	Arunachal Pradesh 2e+09	2021	2745794	8.270
12	Assam 75e+10	2018	8806777	1.320
13	Assam	2019	22691015	4.718

95e+10				
+-----+				
- - - +				
14   Assam	2020	47135224	1.104	
93e+11				
+-----+				
- - - +				
15   Assam	2021	44944965	1.105	
19e+11				
+-----+				
- - - +				
16   Bihar	2018	44556885	6.808	
57e+10				
+-----+				
- - - +				
17   Bihar	2019	131986927	2.656	
41e+11				
+-----+				
- - - +				
18   Bihar	2020	266563978	6.502	
98e+11				
+-----+				
- - - +				
19   Bihar	2021	270536099	6.555	
54e+11				
+-----+				
- - - +				
20   Chandigarh	2018	2383031	4.976	
6e+09				
+-----+				
- - - +				
21   Chandigarh	2019	5884404	1.251	
13e+10				
+-----+				
- - - +				
22   Chandigarh	2020	8861323	2.021	
e+10				
+-----+				
- - - +				
23   Chandigarh	2021	8387784	1.601	
41e+10				
+-----+				
- - - +				
24   Chhattisgarh	2018	13933118	2.213	
2e+10				
+-----+				
- - - +				
25   Chhattisgarh	2019	45826483	7.649	
4e+10				
+-----+				
- - - +				
26   Chhattisgarh	2020	98023091	1.688	
71e+11				
+-----+				
- - - +				
27   Chhattisgarh	2021	84125857	1.481	
39e+11				
+-----+				
- - - +				
28   Dadra & Nagar Haveli and Daman & Diu	2018	1044832	1.584	

12e+09					
+-----+					
- - - +					
29   Dadra & Nagar Haveli and Daman & Diu   2019   2559192   3.855					
92e+09					
+-----+					
- - - +					
30   Dadra & Nagar Haveli and Daman & Diu   2020   4807834   7.095					
44e+09					
+-----+					
- - - +					
31   Dadra & Nagar Haveli and Daman & Diu   2021   4050327   6.123					
3e+09					
+-----+					
- - - +					
32   Delhi   2018   64231244   9.575					
65e+10					
+-----+					
- - - +					
33   Delhi   2019   254461712   3.723					
97e+11					
+-----+					
- - - +					
34   Delhi   2020   364821900   6.329					
19e+11					
+-----+					
- - - +					
35   Delhi   2021   327516268   5.488					
69e+11					
+-----+					
- - - +					
36   Goa   2018   1244738   2.648					
63e+09					
+-----+					
- - - +					
37   Goa   2019   4114941   7.991					
02e+09					
+-----+					
- - - +					
38   Goa   2020   9080241   1.586					
21e+10					
+-----+					
- - - +					
39   Goa   2021   10041684   1.777					
01e+10					
+-----+					
- - - +					
40   Gujarat   2018   39761960   6.243					
81e+10					
+-----+					
- - - +					
41   Gujarat   2019   134749574   2.213					
3e+11					
+-----+					
- - - +					
42   Gujarat   2020   231865328   4.276					
98e+11					
+-----+					
- - - +					
43   Gujarat   2021   206615961   3.938					

63e+11				
+-----+				
- - - +				
44   Haryana   2018   31843908   5.987				
99e+10				
+-----+				
- - - +				
45   Haryana   2019   113047107   1.984				
02e+11				
+-----+				
- - - +				
46   Haryana   2020   226926755   4.322				
54e+11				
+-----+				
- - - +				
47   Haryana   2021   195933640   3.692				
96e+11				
+-----+				
- - - +				
48   Himachal Pradesh   2018   3364250   6.187				
25e+09				
+-----+				
- - - +				
49   Himachal Pradesh   2019   10922850   2.110				
05e+10				
+-----+				
- - - +				
50   Himachal Pradesh   2020   21602414   3.996				
15e+10				
+-----+				
- - - +				
51   Himachal Pradesh   2021   17097931   3.061				
62e+10				
+-----+				
- - - +				
52   Jammu & Kashmir   2018   7763165   1.325				
6e+10				
+-----+				
- - - +				
53   Jammu & Kashmir   2019   7487796   1.772				
59e+10				
+-----+				
- - - +				
54   Jammu & Kashmir   2020   12776978   3.856				
14e+10				
+-----+				
- - - +				
55   Jammu & Kashmir   2021   17025389   3.995				
21e+10				
+-----+				
- - - +				
56   Jharkhand   2018   19737665   2.599				
93e+10				
+-----+				
- - - +				
57   Jharkhand   2019   51985184   8.186				
37e+10				
+-----+				
- - - +				
58   Jharkhand   2020   104924330   1.945				

25e+11				
+-----+				
- - - +				
59   Jharkhand		2021	98623808	1.881
82e+11		+-----+	+-----+	
+-----+				
- - - +				
60   Karnataka		2018	99925678	1.739
67e+11		+-----+	+-----+	
+-----+				
- - - +				
61   Karnataka		2019	610519200	7.912
62e+11		+-----+	+-----+	
+-----+				
- - - +				
62   Karnataka		2020	1216153117	1.803
28e+12		+-----+	+-----+	
+-----+				
- - - +				
63   Karnataka		2021	1054446538	1.592
88e+12		+-----+	+-----+	
+-----+				
- - - +				
64   Kerala		2018	11524547	1.936
e+10		+-----+	+-----+	
+-----+				
- - - +				
65   Kerala		2019	35537598	6.084
75e+10		+-----+	+-----+	
+-----+				
- - - +				
66   Kerala		2020	87068356	1.492
65e+11		+-----+	+-----+	
+-----+				
- - - +				
67   Kerala		2021	89507375	1.434
88e+11		+-----+	+-----+	
+-----+				
- - - +				
68   Ladakh		2018	81174	2.794
82e+08		+-----+	+-----+	
+-----+				
- - - +				
69   Ladakh		2019	292019	1.067
93e+09		+-----+	+-----+	
+-----+				
- - - +				
70   Ladakh		2020	831785	2.848
88e+09		+-----+	+-----+	
+-----+				
- - - +				
71   Ladakh		2021	675131	2.410
68e+09		+-----+	+-----+	
+-----+				
- - - +				
72   Lakshadweep		2018	6255	1.691
87e+07		+-----+	+-----+	
+-----+				
- - - +				
73   Lakshadweep		2019	12276	3.895

03e+07				
+-----+				
- - - +				
74   Lakshadweep   2020   32610   8.186				
34e+07				
+-----+				
- - - +				
75   Lakshadweep   2021   20469   5.442				
62e+07				
+-----+				
- - - +				
76   Madhya Pradesh   2018   57111347   8.266				
1e+10				
+-----+				
- - - +				
77   Madhya Pradesh   2019   199889462   2.987				
69e+11				
+-----+				
- - - +				
78   Madhya Pradesh   2020   417939741   7.646				
36e+11				
+-----+				
- - - +				
79   Madhya Pradesh   2021   425313178   7.690				
35e+11				
+-----+				
- - - +				
80   Maharashtra   2018   116301535   1.898				
48e+11				
+-----+				
- - - +				
81   Maharashtra   2019   526225123   7.373				
27e+11				
+-----+				
- - - +				
82   Maharashtra   2020   1099666770   1.678				
82e+12				
+-----+				
- - - +				
83   Maharashtra   2021   1091476726   1.685				
e+12				
+-----+				
- - - +				
84   Manipur   2018   661158   1.370				
27e+09				
+-----+				
- - - +				
85   Manipur   2019   1317186   3.447				
14e+09				
+-----+				
- - - +				
86   Manipur   2020   4949889   1.601				
57e+10				
+-----+				
- - - +				
87   Manipur   2021   5389810   1.496				
01e+10				
+-----+				
- - - +				
88   Meghalaya   2018   388850   7.306				

94e+08				
+-----+				
- - - +				
89   Meghalaya	2019	1113558	2.246	
62e+09				
+-----+				
- - - +				
90   Meghalaya	2020	2489265	5.315	
17e+09				
+-----+				
- - - +				
91   Meghalaya	2021	1657240	4.249	
13e+09				
+-----+				
- - - +				
92   Mizoram	2018	140170	4.357	
63e+08				
+-----+				
- - - +				
93   Mizoram	2019	369310	1.113	
66e+09				
+-----+				
- - - +				
94   Mizoram	2020	929381	2.543	
74e+09				
+-----+				
- - - +				
95   Mizoram	2021	723915	2.223	
98e+09				
+-----+				
- - - +				
96   Nagaland	2018	342148	8.611	
38e+08				
+-----+				
- - - +				
97   Nagaland	2019	936380	2.447	
5e+09				
+-----+				
- - - +				
98   Nagaland	2020	2479761	6.815	
19e+09				
+-----+				
- - - +				
99   Nagaland	2021	2106688	6.263	
74e+09				
+-----+				
- - - +				
100   Odisha	2018	65162918	5.964	
03e+10				
+-----+				
- - - +				
101   Odisha	2019	169961871	2.172	
56e+11				
+-----+				
- - - +				
102   Odisha	2020	262069662	4.844	
56e+11				
+-----+				
- - - +				
103   Odisha	2021	243284695	4.592	

62e+11				
+-----+				
- - - +				
104   Puducherry   2018   732708   1.494				
98e+09				
+-----+				
- - - +				
105   Puducherry   2019   2810650   5.510				
66e+09				
+-----+				
- - - +				
106   Puducherry   2020   6688209   1.269				
39e+10				
+-----+				
- - - +				
107   Puducherry   2021   7060819   1.239				
81e+10				
+-----+				
- - - +				
108   Punjab   2018   12800841   2.531				
31e+10				
+-----+				
- - - +				
109   Punjab   2019   40087404   8.508				
49e+10				
+-----+				
- - - +				
110   Punjab   2020   69506576   1.555				
57e+11				
+-----+				
- - - +				
111   Punjab   2021   58942083   1.282				
22e+11				
+-----+				
- - - +				
112   Rajasthan   2018   52782208   8.643				
52e+10				
+-----+				
- - - +				
113   Rajasthan   2019   246343185   4.221				
69e+11				
+-----+				
- - - +				
114   Rajasthan   2020   543585579   1.063				
78e+12				
+-----+				
- - - +				
115   Rajasthan   2021   540207958   1.053				
2e+12				
+-----+				
- - - +				
116   Sikkim   2018   381689   8.265				
66e+08				
+-----+				
- - - +				
117   Sikkim   2019   1948037   3.258				
11e+09				
+-----+				
- - - +				
118   Sikkim   2020   2377319   5.428				

3e+09					
+-----+					
- - - +					
119   Sikkim		2021	1776903	4.642	
57e+09					
+-----+					
- - - +					
120   Tamil Nadu		2018	54950272	1.040	
2e+11					
+-----+					
- - - +					
121   Tamil Nadu		2019	162453376	3.025	
62e+11					
+-----+					
- - - +					
122   Tamil Nadu		2020	300281109	5.627	
11e+11					
+-----+					
- - - +					
123   Tamil Nadu		2021	282715116	5.121	
55e+11					
+-----+					
- - - +					
124   Telangana		2018	67541293	1.178	
65e+11					
+-----+					
- - - +					
125   Telangana		2019	439968715	7.338	
76e+11					
+-----+					
- - - +					
126   Telangana		2020	931480581	1.895	
19e+12					
+-----+					
- - - +					
127   Telangana		2021	908439654	1.827	
32e+12					
+-----+					
- - - +					
128   Tripura		2018	1188478	1.453	
62e+09					
+-----+					
- - - +					
129   Tripura		2019	2627025	3.831	
49e+09					
+-----+					
- - - +					
130   Tripura		2020	4946797	8.881	
91e+09					
+-----+					
- - - +					
131   Tripura		2021	3255852	6.803	
5e+09					
+-----+					
- - - +					
132   Uttar Pradesh		2018	92864871	1.317	
69e+11					
+-----+					
- - - +					
133   Uttar Pradesh		2019	271736968	4.322	

49e+11				
+-----+				
- - - +				
134   Uttar Pradesh		2020	503663873	9.572
79e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				
135   Uttar Pradesh		2021	446448678	8.784
6e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				
136   Uttarakhand		2018	8358700	1.356
91e+10		+-----+	+-----+	+-----+
+-----+				
- - - +				
137   Uttarakhand		2019	23431868	3.807
48e+10		+-----+	+-----+	+-----+
+-----+				
- - - +				
138   Uttarakhand		2020	47611760	8.614
85e+10		+-----+	+-----+	+-----+
+-----+				
- - - +				
139   West Bengal		2021	44608834	7.727
9e+10		+-----+	+-----+	+-----+
+-----+				
- - - +				
140   West Bengal		2018	120011635	1.115
89e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				
141   West Bengal		2019	257900590	2.660
15e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				
142   West Bengal		2020	304222327	5.527
32e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				
143   West Bengal		2021	260151489	5.223
72e+11		+-----+	+-----+	+-----+
+-----+				
- - - +				

Massive growth in digital transactions from 2018 to 2020 across almost all states. Regional pattern:-  
 -South India dominates: Karnataka, Telangana, Andhra Pradesh, Tamil Nadu, Kerala  
 -North & West India strong: Maharashtra, Rajasthan, Gujarat, Delhi, UP  
 -Northeast & UTs lagging: Mizoram, Nagaland, Ladakh, Lakshadweep

```
In [26]: #Identify the top 5 states with the highest transaction volumes and the top 5 states
state_total_txn = state_txn_users.groupby("State")["Transactions"].sum().sort_values(ascending=False)
top5_states = state_total_txn.head(5)
bottom5_states = state_total_txn.tail(5)
print("Top five states:-")
print(top5_states)
print()
print("Bottom five states:-")
print(bottom5_states)
```

Top five states:-

State

Karnataka	2981044533
Maharashtra	2833670154
Telangana	2347430243
Andhra Pradesh	1491343199
Rajasthan	1382918930

Name: Transactions, dtype: int64

Botton five states:-

State

Meghalaya	5648913
Mizoram	2162776
Ladakh	1880109
Andaman & Nicobar Islands	1223565
Lakshadweep	71610

Name: Transactions, dtype: int64

```
In [27]: # Identify the most common transaction types in each state and quarter
# 1. For each state and quarter, determine the most frequent transaction type. D
most_common_txn = state_txn_split.sort_values(by = ["Transactions"], ascending =
most_common_txn = most_common_txn[['State', 'Year', 'Quarter', 'Transaction Type

print(" Most Common Transaction Type per State & Quarter")
print(tabulate(most_common_txn, headers='keys', tablefmt='grid'))
```

## Most Common Transaction Type per State &amp; Quarter

State	Transactions	Year	Quarter	Transaction Type
0   Andaman & Nicobar Islands 11 payments	4200	2018	1	Recharge & bill payments
1   Andaman & Nicobar Islands 11 payments	6735	2018	2	Recharge & bill payments
2   Andaman & Nicobar Islands 11 payments	8636	2018	3	Recharge & bill payments
3   Andaman & Nicobar Islands 11 payments	11517	2018	4	Recharge & bill payments
4   Andaman & Nicobar Islands 11 payments	15263	2019	1	Recharge & bill payments
5   Andaman & Nicobar Islands 11 payments	14676	2019	2	Recharge & bill payments
6   Andaman & Nicobar Islands 11 payments	16219	2019	3	Recharge & bill payments
7   Andaman & Nicobar Islands payments	18128	2019	4	Peer-to-peer
8   Andaman & Nicobar Islands payments	18324	2020	1	Peer-to-peer
9   Andaman & Nicobar Islands 11 payments	38125	2020	2	Recharge & bill payments
10   Andaman & Nicobar Islands 11 payments	59310	2020	3	Recharge & bill payments
11   Andaman & Nicobar Islands payments	81439	2020	4	Peer-to-peer
12   Andaman & Nicobar Islands payments	105458	2021	1	Peer-to-peer
13   Andaman & Nicobar Islands		2021	2	Peer-to-peer

payments	132772			
+-----+	+-----+	+-----+	+-----+	+-----+
14   Andhra Pradesh		2018	1   Recharge & bi	
payments	5027448			
+-----+	+-----+	+-----+	+-----+	+-----+
15   Andhra Pradesh		2018	2   Recharge & bi	
payments	6456387			
+-----+	+-----+	+-----+	+-----+	+-----+
16   Andhra Pradesh		2018	3   Peer-to-peer	
payments	16129591			
+-----+	+-----+	+-----+	+-----+	+-----+
17   Andhra Pradesh		2018	4   Peer-to-peer	
payments	17580086			
+-----+	+-----+	+-----+	+-----+	+-----+
18   Andhra Pradesh		2019	1   Peer-to-peer	
payments	37420988			
+-----+	+-----+	+-----+	+-----+	+-----+
19   Andhra Pradesh		2019	2   Peer-to-peer	
payments	32494402			
+-----+	+-----+	+-----+	+-----+	+-----+
20   Andhra Pradesh		2019	3   Peer-to-peer	
payments	39023491			
+-----+	+-----+	+-----+	+-----+	+-----+
21   Andhra Pradesh		2019	4   Peer-to-peer	
payments	57181511			
+-----+	+-----+	+-----+	+-----+	+-----+
22   Andhra Pradesh		2020	1   Peer-to-peer	
payments	65452143			
+-----+	+-----+	+-----+	+-----+	+-----+
23   Andhra Pradesh		2020	2   Peer-to-peer	
payments	73609921			
+-----+	+-----+	+-----+	+-----+	+-----+
24   Andhra Pradesh		2020	3   Peer-to-peer	
payments	106791894			
+-----+	+-----+	+-----+	+-----+	+-----+
25   Andhra Pradesh		2020	4   Peer-to-peer	
payments	152003791			
+-----+	+-----+	+-----+	+-----+	+-----+
26   Andhra Pradesh		2021	1   Peer-to-peer	
payments	149313738			
+-----+	+-----+	+-----+	+-----+	+-----+
27   Andhra Pradesh		2021	2   Peer-to-peer	
payments	189614879			
+-----+	+-----+	+-----+	+-----+	+-----+
28   Arunachal Pradesh		2018	1   Recharge & bi	

11 payments	28729			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
29   Arunachal Pradesh		2018	2   Recharge & bi	
11 payments	50700			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
30   Arunachal Pradesh		2018	3   Recharge & bi	
11 payments	74122			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
31   Arunachal Pradesh		2018	4   Recharge & bi	
11 payments	97751			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
32   Arunachal Pradesh		2019	1   Recharge & bi	
11 payments	121303			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
33   Arunachal Pradesh		2019	2   Recharge & bi	
11 payments	131988			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
34   Arunachal Pradesh		2019	3   Recharge & bi	
11 payments	216228			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
35   Arunachal Pradesh		2019	4   Recharge & bi	
11 payments	259183			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
36   Arunachal Pradesh		2020	1   Recharge & bi	
11 payments	329834			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
37   Arunachal Pradesh		2020	2   Recharge & bi	
11 payments	522495			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
38   Arunachal Pradesh		2020	3   Recharge & bi	
11 payments	514907			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
39   Arunachal Pradesh		2020	4   Peer-to-peer	
payments	522019			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
40   Arunachal Pradesh		2021	1   Peer-to-peer	
payments	566209			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
41   Arunachal Pradesh		2021	2   Peer-to-peer	
payments	762946			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
42   Assam		2018	1   Recharge & bi	
11 payments	632092			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
43   Assam		2018	2   Recharge & bi	

11 payments	984160			
44   Assam		2018	3   Recharge & bi	
11 payments	1275136			
45   Assam		2018	4   Recharge & bi	
11 payments	1703488			
46   Assam		2019	1   Recharge & bi	
11 payments	1993220			
47   Assam		2019	2   Recharge & bi	
11 payments	2512932			
48   Assam		2019	3   Peer-to-peer	
payments	2713539			
49   Assam		2019	4   Peer-to-peer	
payments	3222143			
50   Assam		2020	1   Peer-to-peer	
payments	4058740			
51   Assam		2020	2   Recharge & bi	
11 payments	6045321			
52   Assam		2020	3   Peer-to-peer	
payments	5637893			
53   Assam		2020	4   Peer-to-peer	
payments	7538478			
54   Assam		2021	1   Peer-to-peer	
payments	9449096			
55   Assam		2021	2   Peer-to-peer	
payments	11668399			
56   Bihar		2018	1   Recharge & bi	
11 payments	3159922			
57   Bihar		2018	2   Recharge & bi	
11 payments	4346849			
58   Bihar		2018	3   Peer-to-peer	

payments	8893764			
59   Bihar		2018	4	Peer-to-peer
payments	8094296			
60   Bihar		2019	1	Peer-to-peer
payments	16807040			
61   Bihar		2019	2	Peer-to-peer
payments	15837449			
62   Bihar		2019	3	Peer-to-peer
payments	15446119			
63   Bihar		2019	4	Peer-to-peer
payments	26337842			
64   Bihar		2020	1	Peer-to-peer
payments	23163922			
65   Bihar		2020	2	Peer-to-peer
payments	26572651			
66   Bihar		2020	3	Peer-to-peer
payments	37294332			
67   Bihar		2020	4	Peer-to-peer
payments	49432098			
68   Bihar		2021	1	Peer-to-peer
payments	58566582			
69   Bihar		2021	2	Peer-to-peer
payments	78694099			
70   Chandigarh		2018	1	Recharge & bi
11 payments	201262			
71   Chandigarh		2018	2	Recharge & bi
11 payments	224548			
72   Chandigarh		2018	3	Peer-to-peer
payments	295358			
73   Chandigarh		2018	4	Peer-to-peer

payments	431461			
74   Chandigarh		2019	1	Peer-to-peer
payments	689400			
75   Chandigarh		2019	2	Peer-to-peer
payments	604849			
76   Chandigarh		2019	3	Peer-to-peer
payments	722233			
77   Chandigarh		2019	4	Peer-to-peer
payments	927850			
78   Chandigarh		2020	1	Peer-to-peer
payments	1087401			
79   Chandigarh		2020	2	Peer-to-peer
payments	766698			
80   Chandigarh		2020	3	Peer-to-peer
payments	981986			
81   Chandigarh		2020	4	Merchant paym
ents	1322026			
82   Chandigarh		2021	1	Merchant paym
ents	1799072			
83   Chandigarh		2021	2	Merchant paym
ents	1926913			
84   Chhattisgarh		2018	1	Recharge & bi
ll payments	1177618			
85   Chhattisgarh		2018	2	Recharge & bi
ll payments	1643461			
86   Chhattisgarh		2018	3	Recharge & bi
ll payments	1911374			
87   Chhattisgarh		2018	4	Recharge & bi
ll payments	2438959			
88   Chhattisgarh		2019	1	Peer-to-peer

payments	4068056			
89   Chhattisgarh		2019	2	Peer-to-peer
payments	4350167			
90   Chhattisgarh		2019	3	Peer-to-peer
payments	5021844			
91   Chhattisgarh		2019	4	Peer-to-peer
payments	7241974			
92   Chhattisgarh		2020	1	Peer-to-peer
payments	8109789			
93   Chhattisgarh		2020	2	Recharge & bi
payments	8366200			
94   Chhattisgarh		2020	3	Peer-to-peer
payments	9734445			
95   Chhattisgarh		2020	4	Peer-to-peer
payments	14257312			
96   Chhattisgarh		2021	1	Peer-to-peer
payments	15621154			
97   Chhattisgarh		2021	2	Peer-to-peer
payments	18387345			
98   Dadra & Nagar Haveli and Daman & Diu	95544	2018	1	Recharge & bi
payments				
99   Dadra & Nagar Haveli and Daman & Diu	122834	2018	2	Recharge & bi
payments				
100   Dadra & Nagar Haveli and Daman & Diu	157113	2018	3	Recharge & bi
payments				
101   Dadra & Nagar Haveli and Daman & Diu	194214	2018	4	Peer-to-peer
payments				
102   Dadra & Nagar Haveli and Daman & Diu	408465	2019	1	Peer-to-peer
payments				
103   Dadra & Nagar Haveli and Daman & Diu		2019	2	Peer-to-peer

payments		244134				
+-----+			+-----+			
104   Dadra & Nagar Haveli and Daman & Diu   2019   3   Recharge & bi						
11 payments   319142			+-----+			
+-----+						
105   Dadra & Nagar Haveli and Daman & Diu   2019   4   Recharge & bi						
11 payments   351819			+-----+			
+-----+						
106   Dadra & Nagar Haveli and Daman & Diu   2020   1   Recharge & bi						
11 payments   407577			+-----+			
+-----+						
107   Dadra & Nagar Haveli and Daman & Diu   2020   2   Recharge & bi						
11 payments   525974			+-----+			
+-----+						
108   Dadra & Nagar Haveli and Daman & Diu   2020   3   Recharge & bi						
payments   455603			+-----+			
+-----+						
109   Dadra & Nagar Haveli and Daman & Diu   2020   4   Peer-to-peer						
payments   666995			+-----+			
+-----+						
110   Dadra & Nagar Haveli and Daman & Diu   2021   1   Peer-to-peer						
payments   768921			+-----+			
+-----+						
111   Dadra & Nagar Haveli and Daman & Diu   2021   2   Peer-to-peer						
payments   843550			+-----+			
+-----+						
112   Delhi   2018   1   Recharge & bi						
11 payments   3947297			+-----+			
+-----+						
113   Delhi   2018   2   Recharge & bi						
11 payments   4511737			+-----+			
+-----+						
114   Delhi   2018   3   Peer-to-peer						
payments   8557153			+-----+			
+-----+						
115   Delhi   2018   4   Peer-to-peer						
payments   9973249			+-----+			
+-----+						
116   Delhi   2019   1   Peer-to-peer						
payments   20216287			+-----+			
+-----+						
117   Delhi   2019   2   Merchant paym						
ents   20891431			+-----+			
+-----+						
118   Delhi   2019   3   Merchant paym						

payments	29453368			
payments	33040093	2019	4	Peer-to-peer
payments	33951545	2020	1	Merchant paym
payments	27155938	2020	2	Peer-to-peer
payments	41498638	2020	3	Peer-to-peer
payments	54581166	2020	4	Merchant paym
payments	72615587	2021	1	Merchant paym
payments	75620295	2021	2	Merchant paym
11 payments	85991	2018	1	Recharge & bi
11 payments	120943	2018	2	Recharge & bi
11 payments	158797	2018	3	Recharge & bi
payments	246426	2018	4	Peer-to-peer
payments	378848	2019	1	Peer-to-peer
payments	373759	2019	2	Peer-to-peer
payments	475178	2019	3	Peer-to-peer
payments		2019	4	Peer-to-peer

payments	698728			
134   Goa		2020	1	Peer-to-peer
payments	817198			
135   Goa		2020	2	Recharge & bi
11 payments	758617			
136   Goa		2020	3	Peer-to-peer
payments	759351			
137   Goa		2020	4	Peer-to-peer
payments	1550251			
138   Goa		2021	1	Peer-to-peer
payments	2235456			
139   Goa		2021	2	Merchant paym
ents	1869384			
140   Gujarat		2018	1	Recharge & bi
11 payments	3691952			
141   Gujarat		2018	2	Recharge & bi
11 payments	4643367			
142   Gujarat		2018	3	Peer-to-peer
payments	5287200			
143   Gujarat		2018	4	Peer-to-peer
payments	6488202			
144   Gujarat		2019	1	Peer-to-peer
payments	13465044			
145   Gujarat		2019	2	Peer-to-peer
payments	12547493			
146   Gujarat		2019	3	Peer-to-peer
payments	14529353			
147   Gujarat		2019	4	Peer-to-peer
payments	19107911			
148   Gujarat		2020	1	Peer-to-peer

payments	19068093			
+-----+-----+-----+-----+				
149   Gujarat		2020	2	Recharge & bi
11 payments	19971660			
+-----+-----+-----+-----+				
150   Gujarat		2020	3	Peer-to-peer
payments	23130724			
+-----+-----+-----+-----+				
151   Gujarat		2020	4	Peer-to-peer
payments	29967258			
+-----+-----+-----+-----+				
152   Gujarat		2021	1	Peer-to-peer
payments	36427493			
+-----+-----+-----+-----+				
153   Gujarat		2021	2	Merchant paym
ents	42593432			
+-----+-----+-----+-----+				
154   Haryana		2018	1	Recharge & bi
11 payments	2368002			
+-----+-----+-----+-----+				
155   Haryana		2018	2	Recharge & bi
11 payments	3054284			
+-----+-----+-----+-----+				
156   Haryana		2018	3	Peer-to-peer
payments	3753981			
+-----+-----+-----+-----+				
157   Haryana		2018	4	Peer-to-peer
payments	5905032			
+-----+-----+-----+-----+				
158   Haryana		2019	1	Peer-to-peer
payments	12622225			
+-----+-----+-----+-----+				
159   Haryana		2019	2	Peer-to-peer
payments	10387562			
+-----+-----+-----+-----+				
160   Haryana		2019	3	Peer-to-peer
payments	11775288			
+-----+-----+-----+-----+				
161   Haryana		2019	4	Peer-to-peer
payments	15729819			
+-----+-----+-----+-----+				
162   Haryana		2020	1	Peer-to-peer
payments	17728235			
+-----+-----+-----+-----+				
163   Haryana		2020	2	Peer-to-peer

payments	17334369			
+-----+-----+-----+-----+				
164   Haryana		2020	3	Peer-to-peer
payments	24123449			
+-----+-----+-----+-----+				
165   Haryana		2020	4	Merchant paym
ents	34063692			
+-----+-----+-----+-----+				
166   Haryana		2021	1	Merchant paym
ents	39363588			
+-----+-----+-----+-----+				
167   Haryana		2021	2	Merchant paym
ents	45335533			
+-----+-----+-----+-----+				
168   Himachal Pradesh		2018	1	Recharge & bi
ll payments	284371			
+-----+-----+-----+-----+				
169   Himachal Pradesh		2018	2	Recharge & bi
ll payments	385642			
+-----+-----+-----+-----+				
170   Himachal Pradesh		2018	3	Recharge & bi
ll payments	457449			
+-----+-----+-----+-----+				
171   Himachal Pradesh		2018	4	Recharge & bi
ll payments	598325			
+-----+-----+-----+-----+				
172   Himachal Pradesh		2019	1	Peer-to-peer
payments	1178280			
+-----+-----+-----+-----+				
173   Himachal Pradesh		2019	2	Peer-to-peer
payments	1141873			
+-----+-----+-----+-----+				
174   Himachal Pradesh		2019	3	Recharge & bi
ll payments	1212659			
+-----+-----+-----+-----+				
175   Himachal Pradesh		2019	4	Peer-to-peer
payments	1579582			
+-----+-----+-----+-----+				
176   Himachal Pradesh		2020	1	Recharge & bi
ll payments	1815157			
+-----+-----+-----+-----+				
177   Himachal Pradesh		2020	2	Recharge & bi
ll payments	2558935			
+-----+-----+-----+-----+				
178   Himachal Pradesh		2020	3	Recharge & bi

11 payments	2416395		
179   Himachal Pradesh		2020	4   Recharge & bi
11 payments	2638030		
180   Himachal Pradesh		2021	1   Peer-to-peer
payments	2845733		
181   Himachal Pradesh		2021	2   Peer-to-peer
payments	3340531		
182   Jammu & Kashmir		2018	1   Recharge & bi
11 payments	457813		
183   Jammu & Kashmir		2018	2   Recharge & bi
11 payments	794502		
184   Jammu & Kashmir		2018	3   Peer-to-peer
payments	1260453		
185   Jammu & Kashmir		2018	4   Peer-to-peer
payments	1265457		
186   Jammu & Kashmir		2019	1   Peer-to-peer
payments	1913720		
187   Jammu & Kashmir		2019	2   Peer-to-peer
payments	1180781		
188   Jammu & Kashmir		2019	3   Peer-to-peer
payments	618694		
189   Jammu & Kashmir		2019	4   Peer-to-peer
payments	310620		
190   Jammu & Kashmir		2020	1   Peer-to-peer
payments	435154		
191   Jammu & Kashmir		2020	2   Peer-to-peer
payments	1238380		
192   Jammu & Kashmir		2020	3   Peer-to-peer
payments	1787154		
193   Jammu & Kashmir		2020	4   Peer-to-peer

payments	2378539			
194   Jammu & Kashmir		2021	1	Peer-to-peer
payments	2800201			
195   Jammu & Kashmir		2021	2	Peer-to-peer
payments	3955437			
196   Jharkhand		2018	1	Recharge & bi
payments	1095857			
197   Jharkhand		2018	2	Recharge & bi
payments	1398777			
198   Jharkhand		2018	3	Peer-to-peer
payments	6003688			
199   Jharkhand		2018	4	Peer-to-peer
payments	3325473			
200   Jharkhand		2019	1	Peer-to-peer
payments	5952105			
201   Jharkhand		2019	2	Peer-to-peer
payments	5155937			
202   Jharkhand		2019	3	Peer-to-peer
payments	5708187			
203   Jharkhand		2019	4	Peer-to-peer
payments	10301226			
204   Jharkhand		2020	1	Peer-to-peer
payments	8196850			
205   Jharkhand		2020	2	Peer-to-peer
payments	8724053			
206   Jharkhand		2020	3	Peer-to-peer
payments	11984094			
207   Jharkhand		2020	4	Peer-to-peer
payments	17120664			
208   Jharkhand		2021	1	Peer-to-peer

payments	19151083				
209   Jharkhand		2021	2	Peer-to-peer	
payments	24184568				
210   Karnataka		2018	1	Recharge & bi	
11 payments	5785292				
211   Karnataka		2018	2	Recharge & bi	
11 payments	7391926				
212   Karnataka		2018	3	Peer-to-peer	
payments	12863507				
213   Karnataka		2018	4	Peer-to-peer	
payments	20471744				
214   Karnataka		2019	1	Peer-to-peer	
payments	44049036				
215   Karnataka		2019	2	Peer-to-peer	
payments	50033334				
216   Karnataka		2019	3	Merchant paym	
ents	76924325				
217   Karnataka		2019	4	Merchant paym	
ents	114044901				
218   Karnataka		2020	1	Merchant paym	
ents	132970737				
219   Karnataka		2020	2	Merchant paym	
ents	87251639				
220   Karnataka		2020	3	Merchant paym	
ents	137206600				
221   Karnataka		2020	4	Merchant paym	
ents	215711211				
222   Karnataka		2021	1	Merchant paym	
ents	279599017				
223   Karnataka		2021	2	Merchant paym	

ents	244460862			
224   Kerala	988774	2018	1   Recharge & bi	
11 payments				
225   Kerala	1230869	2018	2   Recharge & bi	
11 payments				
226   Kerala	1425259	2018	3   Peer-to-peer	
payments				
227   Kerala	2073960	2018	4   Peer-to-peer	
payments				
228   Kerala	3601116	2019	1   Peer-to-peer	
payments				
229   Kerala	3519528	2019	2   Peer-to-peer	
payments				
230   Kerala	4181954	2019	3   Peer-to-peer	
payments				
231   Kerala	5859068	2019	4   Peer-to-peer	
payments				
232   Kerala	6634439	2020	1   Peer-to-peer	
payments				
233   Kerala	7709714	2020	2   Recharge & bi	
11 payments				
234   Kerala	8590587	2020	3   Peer-to-peer	
payments				
235   Kerala	12941135	2020	4   Peer-to-peer	
payments				
236   Kerala	16209203	2021	1   Peer-to-peer	
payments				
237   Kerala	17026648	2021	2   Peer-to-peer	
payments				
238   Ladakh		2018	1   Recharge & bi	

11 payments	3550			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
239   Ladakh		2018	2   Recharge & bi	
11 payments	8075	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
240   Ladakh		2018	3   Recharge & bi	
11 payments	13136	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
241   Ladakh		2018	4   Recharge & bi	
11 payments	16650	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
242   Ladakh		2019	1   Peer-to-peer	
payments	22076	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
243   Ladakh		2019	2   Peer-to-peer	
payments	34202	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
244   Ladakh		2019	3   Peer-to-peer	
payments	43198	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
245   Ladakh		2019	4   Peer-to-peer	
payments	42095	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
246   Ladakh		2020	1   Peer-to-peer	
payments	51560	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
247   Ladakh		2020	2   Recharge & bi	
11 payments	70601	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
248   Ladakh		2020	3   Peer-to-peer	
payments	108345	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
249   Ladakh		2020	4   Peer-to-peer	
payments	151582	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
250   Ladakh		2021	1   Peer-to-peer	
payments	141894	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
251   Ladakh		2021	2   Peer-to-peer	
payments	209818	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
252   Lakshadweep		2018	1   Peer-to-peer	
payments	423	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
253   Lakshadweep		2018	2   Peer-to-peer	

payments	1315			
254   Lakshadweep		2018	3	Peer-to-peer
payments	841			
255   Lakshadweep		2018	4	Recharge & bi
11 payments	792			
256   Lakshadweep		2019	1	Peer-to-peer
payments	1183			
257   Lakshadweep		2019	2	Recharge & bi
11 payments	1448			
258   Lakshadweep		2019	3	Recharge & bi
11 payments	1528			
259   Lakshadweep		2019	4	Recharge & bi
11 payments	1801			
260   Lakshadweep		2020	1	Recharge & bi
11 payments	2684			
261   Lakshadweep		2020	2	Recharge & bi
11 payments	4497			
262   Lakshadweep		2020	3	Recharge & bi
11 payments	4696			
263   Lakshadweep		2020	4	Recharge & bi
11 payments	5187			
264   Lakshadweep		2021	1	Peer-to-peer
payments	3942			
265   Lakshadweep		2021	2	Recharge & bi
11 payments	5499			
266   Madhya Pradesh		2018	1	Recharge & bi
11 payments	4404190			
267   Madhya Pradesh		2018	2	Recharge & bi
11 payments	5324535			
268   Madhya Pradesh		2018	3	Peer-to-peer

payments	9988509			
269   Madhya Pradesh		2018	4	Peer-to-peer
payments	11456555			
270   Madhya Pradesh		2019	1	Peer-to-peer
payments	23708825			
271   Madhya Pradesh		2019	2	Peer-to-peer
payments	20868744			
272   Madhya Pradesh		2019	3	Peer-to-peer
payments	22631038			
273   Madhya Pradesh		2019	4	Peer-to-peer
payments	32083162			
274   Madhya Pradesh		2020	1	Peer-to-peer
payments	34540722			
275   Madhya Pradesh		2020	2	Peer-to-peer
payments	34860958			
276   Madhya Pradesh		2020	3	Peer-to-peer
payments	50871564			
277   Madhya Pradesh		2020	4	Peer-to-peer
payments	67972167			
278   Madhya Pradesh		2021	1	Merchant paym
ents	84812245			
279   Madhya Pradesh		2021	2	Peer-to-peer
payments	99367521			
280   Maharashtra		2018	1	Recharge & bi
11 payments	9670237			
281   Maharashtra		2018	2	Recharge & bi
11 payments	12384216			
282   Maharashtra		2018	3	Recharge & bi
11 payments	14371791			
283   Maharashtra		2018	4	Peer-to-peer

payments	20824667			
284   Maharashtra		2019	1	Peer-to-peer
payments	37360716			
285   Maharashtra		2019	2	Peer-to-peer
payments	42546317			
286   Maharashtra		2019	3	Peer-to-peer
payments	57991699			
287   Maharashtra		2019	4	Merchant paym
ents	80127804			
288   Maharashtra		2020	1	Merchant paym
ents	100337738			
289   Maharashtra		2020	2	Peer-to-peer
payments	74295930			
290   Maharashtra		2020	3	Peer-to-peer
payments	108436214			
291   Maharashtra		2020	4	Merchant paym
ents	189845640			
292   Maharashtra		2021	1	Merchant paym
ents	253043309			
293   Maharashtra		2021	2	Merchant paym
ents	247194293			
294   Manipur		2018	1	Recharge & bi
11 payments	50212			
295   Manipur		2018	2	Recharge & bi
11 payments	77991			
296   Manipur		2018	3	Peer-to-peer
payments	95204			
297   Manipur		2018	4	Recharge & bi
11 payments	113507			
298   Manipur		2019	1	Peer-to-peer

payments	127067			
299   Manipur		2019	2	Peer-to-peer
payments	120153			
300   Manipur		2019	3	Recharge & bi
11 payments	180057			
301   Manipur		2019	4	Recharge & bi
11 payments	212136			
302   Manipur		2020	1	Peer-to-peer
payments	451733			
303   Manipur		2020	2	Peer-to-peer
payments	533206			
304   Manipur		2020	3	Peer-to-peer
payments	774786			
305   Manipur		2020	4	Peer-to-peer
payments	892853			
306   Manipur		2021	1	Peer-to-peer
payments	1117829			
307   Manipur		2021	2	Peer-to-peer
payments	1372821			
308   Meghalaya		2018	1	Recharge & bi
11 payments	31857			
309   Meghalaya		2018	2	Recharge & bi
11 payments	42625			
310   Meghalaya		2018	3	Recharge & bi
11 payments	60625			
311   Meghalaya		2018	4	Recharge & bi
11 payments	82962			
312   Meghalaya		2019	1	Recharge & bi
11 payments	98817			
313   Meghalaya		2019	2	Recharge & bi

11 payments	108812			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
314   Meghalaya		2019	3   Recharge & bi	
11 payments	155949	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
315   Meghalaya		2019	4   Recharge & bi	
11 payments	175084	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
316   Meghalaya		2020	1   Recharge & bi	
11 payments	226214	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
317   Meghalaya		2020	2   Recharge & bi	
11 payments	382662	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
318   Meghalaya		2020	3   Recharge & bi	
11 payments	342484	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
319   Meghalaya		2020	4   Recharge & bi	
11 payments	350006	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
320   Meghalaya		2021	1   Peer-to-peer	
payments	326993	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
321   Meghalaya		2021	2   Recharge & bi	
11 payments	389959	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
322   Mizoram		2018	1   Recharge & bi	
11 payments	10155	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
323   Mizoram		2018	2   Recharge & bi	
11 payments	13550	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
324   Mizoram		2018	3   Peer-to-peer	
payments	18564	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
325   Mizoram		2018	4   Peer-to-peer	
payments	26212	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
326   Mizoram		2019	1   Peer-to-peer	
payments	35126	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
327   Mizoram		2019	2   Peer-to-peer	
payments	37364	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
328   Mizoram		2019	3   Recharge & bi	

11 payments	49073			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
329   Mizoram		2019	4   Recharge & bi	
11 payments	60511	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
330   Mizoram		2020	1   Recharge & bi	
11 payments	85067	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
331   Mizoram		2020	2   Recharge & bi	
11 payments	127592	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
332   Mizoram		2020	3   Recharge & bi	
11 payments	132664	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
333   Mizoram		2020	4   Peer-to-peer	
payments	141038	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
334   Mizoram		2021	1   Peer-to-peer	
payments	156386	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
335   Mizoram		2021	2   Peer-to-peer	
payments	173064	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
336   Nagaland		2018	1   Recharge & bi	
11 payments	28198	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
337   Nagaland		2018	2   Recharge & bi	
11 payments	41959	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
338   Nagaland		2018	3   Recharge & bi	
11 payments	54885	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
339   Nagaland		2018	4   Recharge & bi	
11 payments	72881	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
340   Nagaland		2019	1   Recharge & bi	
11 payments	87596	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
341   Nagaland		2019	2   Recharge & bi	
11 payments	92492	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
342   Nagaland		2019	3   Recharge & bi	
11 payments	145812	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
343   Nagaland		2019	4   Recharge & bi	

11 payments	172761			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
344   Nagaland		2020	1   Recharge & bi	
11 payments	221741			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
345   Nagaland		2020	2   Recharge & bi	
11 payments	328269			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
346   Nagaland		2020	3   Recharge & bi	
payments	347494			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
347   Nagaland		2020	4   Peer-to-peer	
payments	417393			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
348   Nagaland		2021	1   Peer-to-peer	
payments	477346			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
349   Nagaland		2021	2   Peer-to-peer	
payments	526966			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
350   Odisha		2018	1   Recharge & bi	
11 payments	2874109			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
351   Odisha		2018	2   Peer-to-peer	
payments	3989202			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
352   Odisha		2018	3   Peer-to-peer	
payments	24472139			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
353   Odisha		2018	4   Peer-to-peer	
payments	12285028			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
354   Odisha		2019	1   Peer-to-peer	
payments	24117274			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
355   Odisha		2019	2   Peer-to-peer	
payments	16455353			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
356   Odisha		2019	3   Peer-to-peer	
payments	18490877			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
357   Odisha		2019	4   Peer-to-peer	
payments	43284477			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
358   Odisha		2020	1   Peer-to-peer	

payments		27110930				
+-----+			+-----+			
359   Odisha			2020	2	Peer-to-peer	
payments		24520938				
+-----+			+-----+			
360   Odisha			2020	3	Peer-to-peer	
payments		34182172				
+-----+			+-----+			
361   Odisha			2020	4	Peer-to-peer	
payments		47588728				
+-----+			+-----+			
362   Odisha			2021	1	Peer-to-peer	
payments		54417515				
+-----+			+-----+			
363   Odisha			2021	2	Peer-to-peer	
payments		66929109				
+-----+			+-----+			
364   Puducherry			2018	1	Recharge & bi	
11 payments		53125				
+-----+			+-----+			
365   Puducherry			2018	2	Recharge & bi	
11 payments		59867				
+-----+			+-----+			
366   Puducherry			2018	3	Peer-to-peer	
payments		101817				
+-----+			+-----+			
367   Puducherry			2018	4	Peer-to-peer	
payments		173170				
+-----+			+-----+			
368   Puducherry			2019	1	Peer-to-peer	
payments		313822				
+-----+			+-----+			
369   Puducherry			2019	2	Peer-to-peer	
payments		331248				
+-----+			+-----+			
370   Puducherry			2019	3	Peer-to-peer	
payments		394866				
+-----+			+-----+			
371   Puducherry			2019	4	Peer-to-peer	
payments		559670				
+-----+			+-----+			
372   Puducherry			2020	1	Peer-to-peer	
payments		600290				
+-----+			+-----+			
373   Puducherry			2020	2	Peer-to-peer	

payments	468789			
374   Puducherry		2020	3	Peer-to-peer
payments	855511			
375   Puducherry		2020	4	Peer-to-peer
payments	1211359			
376   Puducherry		2021	1	Peer-to-peer
payments	1406958			
377   Puducherry		2021	2	Peer-to-peer
payments	1581221			
378   Punjab		2018	1	Recharge & bi
11 payments	946338			
379   Punjab		2018	2	Recharge & bi
11 payments	1262450			
380   Punjab		2018	3	Peer-to-peer
payments	1684209			
381   Punjab		2018	4	Peer-to-peer
payments	2269375			
382   Punjab		2019	1	Peer-to-peer
payments	4026294			
383   Punjab		2019	2	Peer-to-peer
payments	4140474			
384   Punjab		2019	3	Peer-to-peer
payments	4726946			
385   Punjab		2019	4	Peer-to-peer
payments	6386367			
386   Punjab		2020	1	Peer-to-peer
payments	6339183			
387   Punjab		2020	2	Recharge & bi
11 payments	6064807			
388   Punjab		2020	3	Peer-to-peer

payments	7354451			
389   Punjab		2020	4	Peer-to-peer
payments	9609405			
390   Punjab		2021	1	Peer-to-peer
payments	10951083			
391   Punjab		2021	2	Peer-to-peer
payments	13180933			
392   Rajasthan		2018	1	Recharge & bi
payments	4305940			
393   Rajasthan		2018	2	Recharge & bi
payments	5288093			
394   Rajasthan		2018	3	Peer-to-peer
payments	7120792			
395   Rajasthan		2018	4	Peer-to-peer
payments	10752729			
396   Rajasthan		2019	1	Peer-to-peer
payments	27621606			
397   Rajasthan		2019	2	Peer-to-peer
payments	25257679			
398   Rajasthan		2019	3	Peer-to-peer
payments	29885618			
399   Rajasthan		2019	4	Peer-to-peer
payments	43354317			
400   Rajasthan		2020	1	Peer-to-peer
payments	48269912			
401   Rajasthan		2020	2	Peer-to-peer
payments	49160792			
402   Rajasthan		2020	3	Peer-to-peer
payments	73247856			
403   Rajasthan		2020	4	Peer-to-peer

payments	88730951			
404   Rajasthan		2021	1	Peer-to-peer
payments	116733195			
405   Rajasthan		2021	2	Peer-to-peer
payments	139277445			
406   Sikkim		2018	1	Recharge & bi
11 payments	26965			
407   Sikkim		2018	2	Recharge & bi
11 payments	45435			
408   Sikkim		2018	3	Recharge & bi
11 payments	58421			
409   Sikkim		2018	4	Recharge & bi
11 payments	79232			
410   Sikkim		2019	1	Peer-to-peer
payments	121984			
411   Sikkim		2019	2	Peer-to-peer
payments	172125			
412   Sikkim		2019	3	Peer-to-peer
payments	203052			
413   Sikkim		2019	4	Peer-to-peer
payments	508471			
414   Sikkim		2020	1	Peer-to-peer
payments	230413			
415   Sikkim		2020	2	Recharge & bi
11 payments	297620			
416   Sikkim		2020	3	Recharge & bi
11 payments	298885			
417   Sikkim		2020	4	Peer-to-peer
payments	334069			
418   Sikkim		2021	1	Peer-to-peer

payments	403703			
419   Sikkim		2021	2	Peer-to-peer
payments	473141			
420   Tamil Nadu		2018	1	Recharge & bi
11 payments	3308548			
421   Tamil Nadu		2018	2	Recharge & bi
11 payments	4464677			
422   Tamil Nadu		2018	3	Peer-to-peer
payments	8810836			
423   Tamil Nadu		2018	4	Peer-to-peer
payments	11538547			
424   Tamil Nadu		2019	1	Peer-to-peer
payments	18645926			
425   Tamil Nadu		2019	2	Peer-to-peer
payments	16952961			
426   Tamil Nadu		2019	3	Peer-to-peer
payments	21277636			
427   Tamil Nadu		2019	4	Peer-to-peer
payments	28814008			
428   Tamil Nadu		2020	1	Peer-to-peer
payments	30880360			
429   Tamil Nadu		2020	2	Peer-to-peer
payments	21700844			
430   Tamil Nadu		2020	3	Peer-to-peer
payments	31754077			
431   Tamil Nadu		2020	4	Peer-to-peer
payments	47800741			
432   Tamil Nadu		2021	1	Peer-to-peer
payments	57446279			
433   Tamil Nadu		2021	2	Peer-to-peer

payments	60812902			
+-----+-----+-----+-----+				
434   Telangana		2018	1	Recharge & bi
payments	4209319			
+-----+-----+-----+-----+				
435   Telangana		2018	2	Peer-to-peer
payments	4784079			
+-----+-----+-----+-----+				
436   Telangana		2018	3	Peer-to-peer
payments	11560952			
+-----+-----+-----+-----+				
437   Telangana		2018	4	Peer-to-peer
payments	15571288			
+-----+-----+-----+-----+				
438   Telangana		2019	1	Peer-to-peer
payments	40488967			
+-----+-----+-----+-----+				
439   Telangana		2019	2	Peer-to-peer
payments	46741594			
+-----+-----+-----+-----+				
440   Telangana		2019	3	Peer-to-peer
payments	59981113			
+-----+-----+-----+-----+				
441   Telangana		2019	4	Peer-to-peer
payments	82587060			
+-----+-----+-----+-----+				
442   Telangana		2020	1	Peer-to-peer
payments	95668911			
+-----+-----+-----+-----+				
443   Telangana		2020	2	Peer-to-peer
payments	76683293			
+-----+-----+-----+-----+				
444   Telangana		2020	3	Peer-to-peer
payments	116668399			
+-----+-----+-----+-----+				
445   Telangana		2020	4	Peer-to-peer
payments	160607487			
+-----+-----+-----+-----+				
446   Telangana		2021	1	Merchant paym
ents	185230619			
+-----+-----+-----+-----+				
447   Telangana		2021	2	Peer-to-peer
payments	230861833			
+-----+-----+-----+-----+				
448   Tripura		2018	1	Recharge & bi

11 payments	86819			
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
449   Tripura		2018	2   Recharge & bi	
11 payments	118171	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
450   Tripura		2018	3   Peer-to-peer	
payments	186065	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
451   Tripura		2018	4   Recharge & bi	
11 payments	204720	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
452   Tripura		2019	1   Peer-to-peer	
payments	296993	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
453   Tripura		2019	2   Peer-to-peer	
payments	240776	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
454   Tripura		2019	3   Recharge & bi	
11 payments	339539	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
455   Tripura		2019	4   Recharge & bi	
11 payments	373779	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
456   Tripura		2020	1   Recharge & bi	
11 payments	449584	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
457   Tripura		2020	2   Recharge & bi	
11 payments	600206	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
458   Tripura		2020	3   Recharge & bi	
11 payments	627363	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
459   Tripura		2020	4   Peer-to-peer	
payments	650386	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
460   Tripura		2021	1   Peer-to-peer	
payments	643366	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
461   Tripura		2021	2   Peer-to-peer	
payments	703728	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
462   Uttar Pradesh		2018	1   Recharge & bi	
11 payments	7003704	+-----+-----+-----+-----+		
+-----+-----+-----+-----+	+-----+-----+-----+-----+			
463   Uttar Pradesh		2018	2   Recharge & bi	

11 payments	9232131			
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
464   Uttar Pradesh payments	13828768	2018	3   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
465   Uttar Pradesh payments	15804910	2018	4   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
466   Uttar Pradesh payments	32062452	2019	1   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
467   Uttar Pradesh payments	27105049	2019	2   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
468   Uttar Pradesh payments	26990786	2019	3   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
469   Uttar Pradesh payments	40540310	2019	4   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
470   Uttar Pradesh payments	39581157	2020	1   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
471   Uttar Pradesh 11 payments	42229417	2020	2   Recharge & bi	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
472   Uttar Pradesh payments	54449911	2020	3   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
473   Uttar Pradesh payments	75433782	2020	4   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
474   Uttar Pradesh payments	85539321	2021	1   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
475   Uttar Pradesh payments	102927942	2021	2   Peer-to-peer	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
476   Uttarakhand 11 payments	730428	2018	1   Recharge & bi	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
477   Uttarakhand 11 payments	946332	2018	2   Recharge & bi	
+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+	+-----+-----+-----+-----+
478   Uttarakhand		2018	3   Peer-to-peer	

payments	1049725			
479   Uttarakhand		2018	4	Peer-to-peer
payments	1556731			
480   Uttarakhand		2019	1	Peer-to-peer
payments	3499130			
481   Uttarakhand		2019	2	Peer-to-peer
payments	2383662			
482   Uttarakhand		2019	3	Peer-to-peer
payments	2313544			
483   Uttarakhand		2019	4	Peer-to-peer
payments	3210116			
484   Uttarakhand		2020	1	Peer-to-peer
payments	3792776			
485   Uttarakhand		2020	2	Recharge & bi
11 payments	3755695			
486   Uttarakhand		2020	3	Peer-to-peer
payments	4836512			
487   Uttarakhand		2020	4	Peer-to-peer
payments	6748183			
488   Uttarakhand		2021	1	Merchant paym
ents	8393767			
489   Uttarakhand		2021	2	Peer-to-peer
payments	9374939			
490   West Bengal		2018	1	Recharge & bi
11 payments	5773831			
491   West Bengal		2018	2	Peer-to-peer
payments	8284944			
492   West Bengal		2018	3	Peer-to-peer
payments	41882429			
493   West Bengal		2018	4	Peer-to-peer

payments	17154995			
494   West Bengal		2019	1	Peer-to-peer
payments	27374206			
495   West Bengal		2019	2	Peer-to-peer
payments	20285958			
496   West Bengal		2019	3	Merchant paym
ents	30804036			
497   West Bengal		2019	4	Peer-to-peer
payments	67037576			
498   West Bengal		2020	1	Peer-to-peer
payments	28457404			
499   West Bengal		2020	2	Peer-to-peer
payments	24855687			
500   West Bengal		2020	3	Peer-to-peer
payments	37556349			
501   West Bengal		2020	4	Peer-to-peer
payments	46437233			
502   West Bengal		2021	1	Peer-to-peer
payments	53869075			
503   West Bengal		2021	2	Peer-to-peer
payments	64661051			

Peer-to-peer payments dominate in most states — especially in UP, Bihar, Maharashtra, and Karnataka. Merchant payments lead in Delhi, Karnataka, Maharashtra — indicating strong commercial activity. Recharge & bill payments are top in smaller or remote regions — like Lakshadweep, Mizoram, Nagaland, etc.

```
In [28]: # Determine the device brand with the highest number of registered users in each
#Identify the device brand with the highest number of registered users in each
top_brand_per_state = state_device_data.sort_values(by = "Registered Users", ascending=False)
result = top_brand_per_state[['State', 'Brand', 'Registered Users']]
print("Top Device Brand by Registered Users in Each State")
print(tabulate(result, headers='keys', tablefmt='grid'))
```

## Top Device Brand by Registered Users in Each State

	State	Brand	Registered Users
0	Andaman & Nicobar Islands	Vivo	15056
1	Andhra Pradesh	Xiaomi	4937684
2	Arunachal Pradesh	Vivo	63439
3	Assam	Xiaomi	909274
4	Bihar	Xiaomi	4268361
5	Chandigarh	Xiaomi	101761
6	Chhattisgarh	Vivo	1169224
7	Dadra & Nagar Haveli and Daman & Diu	Vivo	87001
8	Delhi	Xiaomi	2731995
9	Goa	Xiaomi	152107
10	Gujarat	Vivo	3834323
11	Haryana	Xiaomi	2505880
12	Himachal Pradesh	Xiaomi	513196
13	Jammu & Kashmir	Xiaomi	446949
14	Jharkhand	Xiaomi	1595475
15	Karnataka	Xiaomi	6567268
16	Kerala	Xiaomi	1714598
17	Ladakh	Xiaomi	21227
18	Lakshadweep	Vivo	1118
19	Madhya Pradesh	Xiaomi	4052668
20	Maharashtra	Xiaomi	9764252
21	Manipur	Xiaomi	159031
22	Meghalaya	Xiaomi	48812
23	Mizoram	Xiaomi	29025
24	Nagaland	Xiaomi	69897
25	Odisha	Xiaomi	2776465
26	Puducherry	Xiaomi	83067
27	Punjab	Xiaomi	1380642

28   Rajasthan	Vivo	4603263
29   Sikkim	Samsung	55452
30   Tamil Nadu	Xiaomi	4159447
31   Telangana	Xiaomi	4736356
32   Tripura	Xiaomi	116546
33   Uttar Pradesh	Xiaomi	8037309
34   Uttarakhand	Xiaomi	681400
35   West Bengal	Xiaomi	4654760

Xiaomi is the dominant brand in 34 out of 35 states showing its massive reach and affordability

```
In [29]: # Create a list of the top district per state based on population
# 1. For each state, identify the district with the highest population, Display

highest_population_per_state = district_demo.sort_values(by = "Population", ascending=False)
highest_population_per_state = highest_population_per_state[["State", "District"]]

print("District by highest population in Each State")
print(tabulate(highest_population_per_state, headers='keys', tablefmt='grid'))
```

## District by highest population in Each State

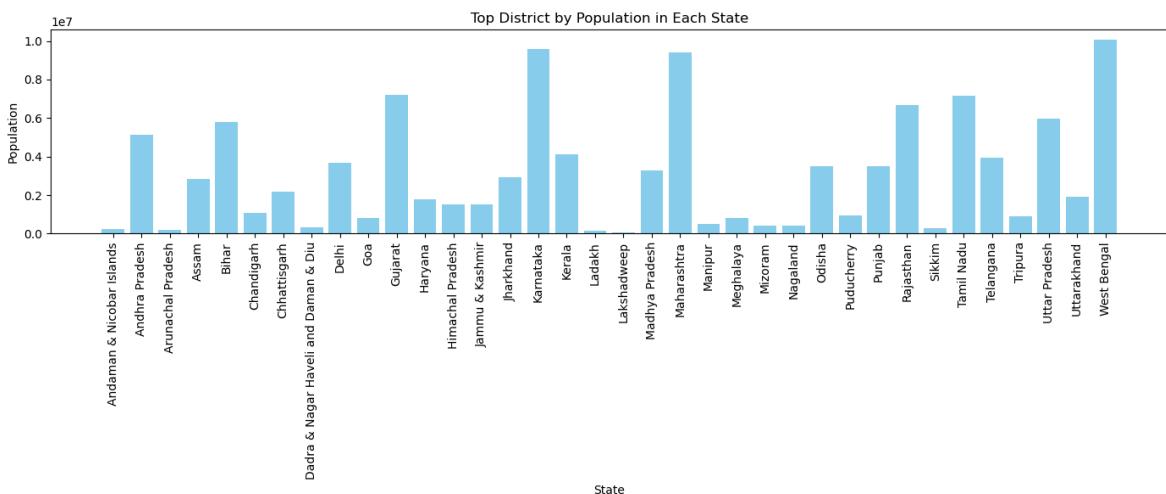
	State	District	Population
42	Andaman & Nicobar Islands	South Andaman	2381
49	Andhra Pradesh	East Godavari	51515
85	Arunachal Pradesh	Papum Pare	1763
06	Assam	Nagaon	28260
04	Bihar	Patna	57728
50	Chandigarh	Chandigarh	10554
76	Chhattisgarh	Raipur	21608
09	Dadra & Nagar Haveli and Daman & Diu	Dadra and Nagar Haveli	3437
39	Delhi	North West Delhi	36565
61	Goa	North Goa	8177
00	Gujarat	Ahmedabad	72082
54	Haryana	Faridabad	17989
23	Himachal Pradesh	Kangra	15072
13	Jammu & Kashmir	Jammu	15264

06			
+---+-----+-----+			
- - +			
14   Jharkhand	Ranchi		29120
22			
+---+-----+-----+			
- - +			
15   Karnataka	Bangalore Urban		95889
10			
+---+-----+-----+			
- - +			
16   Kerala	Malappuram		41109
56			
+---+-----+-----+			
- - +			
17   Ladakh	Kargil		1433
88			
+---+-----+-----+			
- - +			
18   Lakshadweep	Lakshadweep		644
73			
+---+-----+-----+			
- - +			
19   Madhya Pradesh	Indore		32723
35			
+---+-----+-----+			
- - +			
20   Maharashtra	Pune		94269
59			
+---+-----+-----+			
- - +			
21   Manipur	Imphal West		5146
83			
+---+-----+-----+			
- - +			
22   Meghalaya	East Khasi Hills		8240
59			
+---+-----+-----+			
- - +			
23   Mizoram	Aizawl		4040
54			
+---+-----+-----+			
- - +			
24   Nagaland	Tuensang		4148
01			
+---+-----+-----+			
- - +			
25   Odisha	Ganjam		35201
51			
+---+-----+-----+			
- - +			
26   Puducherry	Puducherry		9502
89			
+---+-----+-----+			
- - +			
27   Punjab	Ludhiana		34878
82			
+---+-----+-----+			
- - +			
28   Rajasthan	Jaipur		66639

71			
+---+-----+-----+			
- - +			
29   Sikkim	East Sikkim	2812	
93			
+---+-----+-----+			
- - +			
30   Tamil Nadu	Chennai	71398	
82			
+---+-----+-----+			
- - +			
31   Telangana	Hyderabad	39433	
23			
+---+-----+-----+			
- - +			
32   Tripura	West Tripura	9175	
34			
+---+-----+-----+			
- - +			
33   Uttar Pradesh	Allahabad	59597	
98			
+---+-----+-----+			
- - +			
34   Uttarakhand	Haridwar	19270	
29			
+---+-----+-----+			
- - +			
35   West Bengal	North 24 Parganas	100828	
52			
+---+-----+-----+			
- - +			

```
In [31]: # Column Chart of Top Districts by Population
import matplotlib.pyplot as plt

plt.figure(figsize=(14,6))
plt.bar(highest_population_per_state['State'], highest_population_per_state['Pop'])
plt.xticks(rotation=90)
plt.title('Top District by Population in Each State')
plt.xlabel('State')
plt.ylabel('Population')
plt.tight_layout()
plt.show()
```



```
In [32]: #Calculate the average transaction value (ATV) for each state
# 1. Compute the average transaction value for each state. Display the results i
ATV = state_txn_users.groupby('State')['ATV (INR)'].sum().reset_index()
ATV['ATV (INR)'] = np.round(ATV['ATV (INR)'], 0)
print(" Average Transaction Value (ATV) per State")
print(tabulate(ATV, headers='keys', tablefmt='grid'))
```

## Average Transaction Value (ATV) per State

	State	ATV (INR)
0	Andaman & Nicobar Islands	44230
1	Andhra Pradesh	24473
2	Arunachal Pradesh	36937
3	Assam	28119
4	Bihar	28326
5	Chandigarh	29593
6	Chhattisgarh	23111
7	Dadra & Nagar Haveli and Daman & Diu	20824
8	Delhi	22258
9	Goa	26534
10	Gujarat	23745
11	Haryana	25646
12	Himachal Pradesh	25555
13	Jammu & Kashmir	35119
14	Jharkhand	22853
15	Karnataka	21243
16	Kerala	23400
17	Ladakh	47715
18	Lakshadweep	38866
19	Madhya Pradesh	22416
20	Maharashtra	21229
21	Manipur	36697
22	Meghalaya	28788
23	Mizoram	40985
24	Nagaland	36539
25	Odisha	19994
26	Puducherry	26987
27	Punjab	29193

28   Rajasthan	24608
+---+-----+-----+	+-----+
29   Sikkim	29230
+---+-----+-----+	+-----+
30   Tamil Nadu	26059
+---+-----+-----+	+-----+
31   Telangana	25801
+---+-----+-----+	+-----+
32   Tripura	21758
+---+-----+-----+	+-----+
33   Uttar Pradesh	23231
+---+-----+-----+	+-----+
34   Uttarakhand	23417
+---+-----+-----+	+-----+
35   West Bengal	19230
+---+-----+-----+	+-----+

```
In [33]: # 2. Identify the top 5 states with the highest ATV and the top 5 states with the lowest ATV
ATV = ATV.sort_values(by = "ATV (INR)", ascending= False)
top5_ATV = ATV.head(5)
bottom5_ATV = ATV.tail(5)

print("Top 5 States by ATV")
print(tabulate(top5_ATV, headers='keys', tablefmt='grid'))

print("\n Bottom 5 States by ATV")
print(tabulate(bottom5_ATV, headers='keys', tablefmt='grid'))
```

#### Top 5 States by ATV

+---+-----+-----+	State	ATV (INR)
+=====+=====+=====+	17   Ladakh	47715
+---+-----+-----+	0   Andaman & Nicobar Islands	44230
+---+-----+-----+	23   Mizoram	40985
+---+-----+-----+	18   Lakshadweep	38866
+---+-----+-----+	2   Arunachal Pradesh	36937
+---+-----+-----+		

#### Bottom 5 States by ATV

+---+-----+-----+	State	ATV (INR)
+=====+=====+=====+	15   Karnataka	21243
+---+-----+-----+	20   Maharashtra	21229
+---+-----+-----+	7   Dadra & Nagar Haveli and Daman & Diu	20824
+---+-----+-----+	25   Odisha	19994
+---+-----+-----+	35   West Bengal	19230
+---+-----+-----+		

```
In [34]: # 2.6. Analyze app usage trends
# 1. Calculate the total number of app opens over the years and quarters for each
```

```
app_usage_summary = state_txn_users.groupby(["State","Year","Quarter"])["App Ope  
print("Total App Opens by State, Year & Quarter")  
print(tabulate(app_usage_summary, headers='keys', tablefmt='grid'))
```

## Total App Opens by State, Year &amp; Quarter

	State	Year	Quarter	App Opens
0	Andaman & Nicobar Islands	2018	1	0
1	Andaman & Nicobar Islands	2018	2	0
2	Andaman & Nicobar Islands	2018	3	0
3	Andaman & Nicobar Islands	2018	4	0
4	Andaman & Nicobar Islands	2019	1	0
5	Andaman & Nicobar Islands	2019	2	52640
6	Andaman & Nicobar Islands	2019	3	171107
7	Andaman & Nicobar Islands	2019	4	177012
8	Andaman & Nicobar Islands	2020	1	193586
9	Andaman & Nicobar Islands	2020	2	305072
10	Andaman & Nicobar Islands	2020	3	515565
11	Andaman & Nicobar Islands	2020	4	887208
12	Andaman & Nicobar Islands	2021	1	1004336
13	Andaman & Nicobar Islands	2021	2	2248223
14	Andhra Pradesh	2018	1	0
15	Andhra Pradesh	2018	2	0
16	Andhra Pradesh	2018	3	0
17	Andhra Pradesh	2018	4	0
18	Andhra Pradesh	2019	1	0
19	Andhra Pradesh	2019	2	81375251
20	Andhra Pradesh	2019	3	310953542
21	Andhra Pradesh	2019	4	411201518
22	Andhra Pradesh	2020	1	486513773
23	Andhra Pradesh	2020	2	494341698
24	Andhra Pradesh	2020	3	696300382
25	Andhra Pradesh	2020	4	869078538
26	Andhra Pradesh	2021	2	1044705436
27	Arunachal Pradesh	2018	1	0

28   Arunachal Pradesh	2018	2	0
+-----+	+-----+	+-----+	+-----+
29   Arunachal Pradesh	2018	3	0
+-----+	+-----+	+-----+	+-----+
30   Arunachal Pradesh	2018	4	0
+-----+	+-----+	+-----+	+-----+
31   Arunachal Pradesh	2019	1	0
+-----+	+-----+	+-----+	+-----+
32   Arunachal Pradesh	2019	2	502873
+-----+	+-----+	+-----+	+-----+
33   Arunachal Pradesh	2019	3	1811700
+-----+	+-----+	+-----+	+-----+
34   Arunachal Pradesh	2019	4	2140340
+-----+	+-----+	+-----+	+-----+
35   Arunachal Pradesh	2020	1	2598321
+-----+	+-----+	+-----+	+-----+
36   Arunachal Pradesh	2020	2	3387006
+-----+	+-----+	+-----+	+-----+
37   Arunachal Pradesh	2020	3	4003421
+-----+	+-----+	+-----+	+-----+
38   Arunachal Pradesh	2020	4	4472667
+-----+	+-----+	+-----+	+-----+
39   Arunachal Pradesh	2021	1	4796708
+-----+	+-----+	+-----+	+-----+
40   Arunachal Pradesh	2021	2	13025849
+-----+	+-----+	+-----+	+-----+
41   Assam	2018	1	0
+-----+	+-----+	+-----+	+-----+
42   Assam	2018	2	0
+-----+	+-----+	+-----+	+-----+
43   Assam	2018	3	0
+-----+	+-----+	+-----+	+-----+
44   Assam	2018	4	0
+-----+	+-----+	+-----+	+-----+
45   Assam	2019	1	0
+-----+	+-----+	+-----+	+-----+
46   Assam	2019	2	7350326
+-----+	+-----+	+-----+	+-----+
47   Assam	2019	3	25393673
+-----+	+-----+	+-----+	+-----+
48   Assam	2019	4	26599449
+-----+	+-----+	+-----+	+-----+
49   Assam	2020	1	33097892
+-----+	+-----+	+-----+	+-----+
50   Assam	2020	2	39304924
+-----+	+-----+	+-----+	+-----+
51   Assam	2020	3	41875278
+-----+	+-----+	+-----+	+-----+
52   Assam	2020	4	49321814
+-----+	+-----+	+-----+	+-----+
53   Assam	2021	1	56752364
+-----+	+-----+	+-----+	+-----+
54   Assam	2021	2	102003890
+-----+	+-----+	+-----+	+-----+
55   Bihar	2018	1	0
+-----+	+-----+	+-----+	+-----+
56   Bihar	2018	2	0
+-----+	+-----+	+-----+	+-----+
57   Bihar	2018	3	0
+-----+	+-----+	+-----+	+-----+

58   Bihar	2018	4	0
+-----+	+-----+	+-----+	+-----+
59   Bihar	2019	1	0
+-----+	+-----+	+-----+	+-----+
60   Bihar	2019	2	39607022
+-----+	+-----+	+-----+	+-----+
61   Bihar	2019	3	126521298
+-----+	+-----+	+-----+	+-----+
62   Bihar	2019	4	163998097
+-----+	+-----+	+-----+	+-----+
63   Bihar	2020	1	183868505
+-----+	+-----+	+-----+	+-----+
64   Bihar	2020	2	218435035
+-----+	+-----+	+-----+	+-----+
65   Bihar	2020	3	266652644
+-----+	+-----+	+-----+	+-----+
66   Bihar	2020	4	317056600
+-----+	+-----+	+-----+	+-----+
67   Bihar	2021	1	355792608
+-----+	+-----+	+-----+	+-----+
68   Bihar	2021	2	371198660
+-----+	+-----+	+-----+	+-----+
69   Chandigarh	2018	1	0
+-----+	+-----+	+-----+	+-----+
70   Chandigarh	2018	2	0
+-----+	+-----+	+-----+	+-----+
71   Chandigarh	2018	3	0
+-----+	+-----+	+-----+	+-----+
72   Chandigarh	2018	4	0
+-----+	+-----+	+-----+	+-----+
73   Chandigarh	2019	1	0
+-----+	+-----+	+-----+	+-----+
74   Chandigarh	2019	2	1220176
+-----+	+-----+	+-----+	+-----+
75   Chandigarh	2019	3	4625196
+-----+	+-----+	+-----+	+-----+
76   Chandigarh	2019	4	4960441
+-----+	+-----+	+-----+	+-----+
77   Chandigarh	2020	1	5201211
+-----+	+-----+	+-----+	+-----+
78   Chandigarh	2020	2	3451250
+-----+	+-----+	+-----+	+-----+
79   Chandigarh	2020	3	4888739
+-----+	+-----+	+-----+	+-----+
80   Chandigarh	2020	4	6477974
+-----+	+-----+	+-----+	+-----+
81   Chandigarh	2021	1	7919533
+-----+	+-----+	+-----+	+-----+
82   Chandigarh	2021	2	4733924
+-----+	+-----+	+-----+	+-----+
83   Chhattisgarh	2018	1	0
+-----+	+-----+	+-----+	+-----+
84   Chhattisgarh	2018	2	0
+-----+	+-----+	+-----+	+-----+
85   Chhattisgarh	2018	3	0
+-----+	+-----+	+-----+	+-----+
86   Chhattisgarh	2018	4	0
+-----+	+-----+	+-----+	+-----+
87   Chhattisgarh	2019	1	0
+-----+	+-----+	+-----+	+-----+

88   Chhattisgarh	2019	2	13206373
+-----+	+-----+	+-----+	+-----+
89   Chhattisgarh	2019	3	46362341
+-----+	+-----+	+-----+	+-----+
90   Chhattisgarh	2019	4	57278977
+-----+	+-----+	+-----+	+-----+
91   Chhattisgarh	2020	1	64224101
+-----+	+-----+	+-----+	+-----+
92   Chhattisgarh	2020	2	68493384
+-----+	+-----+	+-----+	+-----+
93   Chhattisgarh	2020	3	86918606
+-----+	+-----+	+-----+	+-----+
94   Chhattisgarh	2020	4	109900467
+-----+	+-----+	+-----+	+-----+
95   Chhattisgarh	2021	1	124648704
+-----+	+-----+	+-----+	+-----+
96   Chhattisgarh	2021	2	205784717
+-----+	+-----+	+-----+	+-----+
97   Dadra & Nagar Haveli and Daman & Diu	2018	1	0
+-----+	+-----+	+-----+	+-----+
98   Dadra & Nagar Haveli and Daman & Diu	2018	2	0
+-----+	+-----+	+-----+	+-----+
99   Dadra & Nagar Haveli and Daman & Diu	2018	3	0
+-----+	+-----+	+-----+	+-----+
100   Dadra & Nagar Haveli and Daman & Diu	2018	4	0
+-----+	+-----+	+-----+	+-----+
101   Dadra & Nagar Haveli and Daman & Diu	2019	1	0
+-----+	+-----+	+-----+	+-----+
102   Dadra & Nagar Haveli and Daman & Diu	2019	2	860686
+-----+	+-----+	+-----+	+-----+
103   Dadra & Nagar Haveli and Daman & Diu	2019	3	3126189
+-----+	+-----+	+-----+	+-----+
104   Dadra & Nagar Haveli and Daman & Diu	2019	4	3770543
+-----+	+-----+	+-----+	+-----+
105   Dadra & Nagar Haveli and Daman & Diu	2020	1	4195122
+-----+	+-----+	+-----+	+-----+
106   Dadra & Nagar Haveli and Daman & Diu	2020	2	4505127
+-----+	+-----+	+-----+	+-----+
107   Dadra & Nagar Haveli and Daman & Diu	2020	3	4421499
+-----+	+-----+	+-----+	+-----+
108   Dadra & Nagar Haveli and Daman & Diu	2020	4	6196436
+-----+	+-----+	+-----+	+-----+
109   Dadra & Nagar Haveli and Daman & Diu	2021	1	7302462
+-----+	+-----+	+-----+	+-----+
110   Dadra & Nagar Haveli and Daman & Diu	2021	2	5062983
+-----+	+-----+	+-----+	+-----+
111   Delhi	2018	1	0
+-----+	+-----+	+-----+	+-----+
112   Delhi	2018	2	0
+-----+	+-----+	+-----+	+-----+
113   Delhi	2018	3	0
+-----+	+-----+	+-----+	+-----+
114   Delhi	2018	4	0
+-----+	+-----+	+-----+	+-----+
115   Delhi	2019	1	0
+-----+	+-----+	+-----+	+-----+
116   Delhi	2019	2	43731570
+-----+	+-----+	+-----+	+-----+
117   Delhi	2019	3	163381027
+-----+	+-----+	+-----+	+-----+

118   Delhi	2019	4	172682671
+-----+	+-----+	+-----+	+-----+
119   Delhi	2020	1	178263986
+-----+	+-----+	+-----+	+-----+
120   Delhi	2020	2	142852253
+-----+	+-----+	+-----+	+-----+
121   Delhi	2020	3	190025029
+-----+	+-----+	+-----+	+-----+
122   Delhi	2020	4	243433752
+-----+	+-----+	+-----+	+-----+
123   Delhi	2021	1	281201600
+-----+	+-----+	+-----+	+-----+
124   Delhi	2021	2	164997774
+-----+	+-----+	+-----+	+-----+
125   Goa	2018	1	0
+-----+	+-----+	+-----+	+-----+
126   Goa	2018	2	0
+-----+	+-----+	+-----+	+-----+
127   Goa	2018	3	0
+-----+	+-----+	+-----+	+-----+
128   Goa	2018	4	0
+-----+	+-----+	+-----+	+-----+
129   Goa	2019	1	0
+-----+	+-----+	+-----+	+-----+
130   Goa	2019	2	1352232
+-----+	+-----+	+-----+	+-----+
131   Goa	2019	3	4753892
+-----+	+-----+	+-----+	+-----+
132   Goa	2019	4	6290543
+-----+	+-----+	+-----+	+-----+
133   Goa	2020	1	7147233
+-----+	+-----+	+-----+	+-----+
134   Goa	2020	2	5310126
+-----+	+-----+	+-----+	+-----+
135   Goa	2020	3	6129766
+-----+	+-----+	+-----+	+-----+
136   Goa	2020	4	10991118
+-----+	+-----+	+-----+	+-----+
137   Goa	2021	1	15467672
+-----+	+-----+	+-----+	+-----+
138   Goa	2021	2	12710361
+-----+	+-----+	+-----+	+-----+
139   Gujarat	2018	1	0
+-----+	+-----+	+-----+	+-----+
140   Gujarat	2018	2	0
+-----+	+-----+	+-----+	+-----+
141   Gujarat	2018	3	0
+-----+	+-----+	+-----+	+-----+
142   Gujarat	2018	4	0
+-----+	+-----+	+-----+	+-----+
143   Gujarat	2019	1	0
+-----+	+-----+	+-----+	+-----+
144   Gujarat	2019	2	34890301
+-----+	+-----+	+-----+	+-----+
145   Gujarat	2019	3	129441484
+-----+	+-----+	+-----+	+-----+
146   Gujarat	2019	4	147973757
+-----+	+-----+	+-----+	+-----+
147   Gujarat	2020	1	165605122
+-----+	+-----+	+-----+	+-----+

148   Gujarat	2020	2	155264359
+-----+	+-----+	+-----+	+-----+
149   Gujarat	2020	3	184402472
+-----+	+-----+	+-----+	+-----+
150   Gujarat	2020	4	230497353
+-----+	+-----+	+-----+	+-----+
151   Gujarat	2021	1	264732874
+-----+	+-----+	+-----+	+-----+
152   Gujarat	2021	2	282432543
+-----+	+-----+	+-----+	+-----+
153   Haryana	2018	1	0
+-----+	+-----+	+-----+	+-----+
154   Haryana	2018	2	0
+-----+	+-----+	+-----+	+-----+
155   Haryana	2018	3	0
+-----+	+-----+	+-----+	+-----+
156   Haryana	2018	4	0
+-----+	+-----+	+-----+	+-----+
157   Haryana	2019	1	0
+-----+	+-----+	+-----+	+-----+
158   Haryana	2019	2	31929195
+-----+	+-----+	+-----+	+-----+
159   Haryana	2019	3	118332587
+-----+	+-----+	+-----+	+-----+
160   Haryana	2019	4	136721888
+-----+	+-----+	+-----+	+-----+
161   Haryana	2020	1	157793468
+-----+	+-----+	+-----+	+-----+
162   Haryana	2020	2	143650123
+-----+	+-----+	+-----+	+-----+
163   Haryana	2020	3	188614769
+-----+	+-----+	+-----+	+-----+
164   Haryana	2020	4	236101307
+-----+	+-----+	+-----+	+-----+
165   Haryana	2021	1	266686683
+-----+	+-----+	+-----+	+-----+
166   Haryana	2021	2	234052506
+-----+	+-----+	+-----+	+-----+
167   Himachal Pradesh	2018	1	0
+-----+	+-----+	+-----+	+-----+
168   Himachal Pradesh	2018	2	0
+-----+	+-----+	+-----+	+-----+
169   Himachal Pradesh	2018	3	0
+-----+	+-----+	+-----+	+-----+
170   Himachal Pradesh	2018	4	0
+-----+	+-----+	+-----+	+-----+
171   Himachal Pradesh	2019	1	0
+-----+	+-----+	+-----+	+-----+
172   Himachal Pradesh	2019	2	3321711
+-----+	+-----+	+-----+	+-----+
173   Himachal Pradesh	2019	3	10720741
+-----+	+-----+	+-----+	+-----+
174   Himachal Pradesh	2019	4	12637904
+-----+	+-----+	+-----+	+-----+
175   Himachal Pradesh	2020	1	14640104
+-----+	+-----+	+-----+	+-----+
176   Himachal Pradesh	2020	2	16125580
+-----+	+-----+	+-----+	+-----+
177   Himachal Pradesh	2020	3	18411750
+-----+	+-----+	+-----+	+-----+

178   Himachal Pradesh	2020	4	22001148
+-----+	+-----+	+-----+	+-----+
179   Himachal Pradesh	2021	1	24228094
+-----+	+-----+	+-----+	+-----+
180   Himachal Pradesh	2021	2	43269977
+-----+	+-----+	+-----+	+-----+
181   Jammu & Kashmir	2018	1	0
+-----+	+-----+	+-----+	+-----+
182   Jammu & Kashmir	2018	2	0
+-----+	+-----+	+-----+	+-----+
183   Jammu & Kashmir	2018	3	0
+-----+	+-----+	+-----+	+-----+
184   Jammu & Kashmir	2018	4	0
+-----+	+-----+	+-----+	+-----+
185   Jammu & Kashmir	2019	1	0
+-----+	+-----+	+-----+	+-----+
186   Jammu & Kashmir	2019	2	2705373
+-----+	+-----+	+-----+	+-----+
187   Jammu & Kashmir	2019	3	3843919
+-----+	+-----+	+-----+	+-----+
188   Jammu & Kashmir	2019	4	998572
+-----+	+-----+	+-----+	+-----+
189   Jammu & Kashmir	2020	1	4476894
+-----+	+-----+	+-----+	+-----+
190   Jammu & Kashmir	2020	2	9856653
+-----+	+-----+	+-----+	+-----+
191   Jammu & Kashmir	2020	3	11443454
+-----+	+-----+	+-----+	+-----+
192   Jammu & Kashmir	2020	4	16018751
+-----+	+-----+	+-----+	+-----+
193   Jammu & Kashmir	2021	1	18834009
+-----+	+-----+	+-----+	+-----+
194   Jammu & Kashmir	2021	2	34274559
+-----+	+-----+	+-----+	+-----+
195   Jharkhand	2018	1	0
+-----+	+-----+	+-----+	+-----+
196   Jharkhand	2018	2	0
+-----+	+-----+	+-----+	+-----+
197   Jharkhand	2018	3	0
+-----+	+-----+	+-----+	+-----+
198   Jharkhand	2018	4	0
+-----+	+-----+	+-----+	+-----+
199   Jharkhand	2019	1	0
+-----+	+-----+	+-----+	+-----+
200   Jharkhand	2019	2	14929066
+-----+	+-----+	+-----+	+-----+
201   Jharkhand	2019	3	55504460
+-----+	+-----+	+-----+	+-----+
202   Jharkhand	2019	4	70181789
+-----+	+-----+	+-----+	+-----+
203   Jharkhand	2020	1	74014713
+-----+	+-----+	+-----+	+-----+
204   Jharkhand	2020	2	76339276
+-----+	+-----+	+-----+	+-----+
205   Jharkhand	2020	3	99318784
+-----+	+-----+	+-----+	+-----+
206   Jharkhand	2020	4	126310835
+-----+	+-----+	+-----+	+-----+
207   Jharkhand	2021	1	141731331
+-----+	+-----+	+-----+	+-----+

208   Jharkhand	2021	2	184234107
+-----+	+-----+	+-----+	+-----+
209   Karnataka	2018	1	0
+-----+	+-----+	+-----+	+-----+
210   Karnataka	2018	2	0
+-----+	+-----+	+-----+	+-----+
211   Karnataka	2018	3	0
+-----+	+-----+	+-----+	+-----+
212   Karnataka	2018	4	0
+-----+	+-----+	+-----+	+-----+
213   Karnataka	2019	1	0
+-----+	+-----+	+-----+	+-----+
214   Karnataka	2019	2	113024811
+-----+	+-----+	+-----+	+-----+
215   Karnataka	2019	3	445683660
+-----+	+-----+	+-----+	+-----+
216   Karnataka	2019	4	569674870
+-----+	+-----+	+-----+	+-----+
217   Karnataka	2020	1	626488036
+-----+	+-----+	+-----+	+-----+
218   Karnataka	2020	2	490510075
+-----+	+-----+	+-----+	+-----+
219   Karnataka	2020	3	693683212
+-----+	+-----+	+-----+	+-----+
220   Karnataka	2020	4	935510690
+-----+	+-----+	+-----+	+-----+
221   Karnataka	2021	1	1084917385
+-----+	+-----+	+-----+	+-----+
222   Karnataka	2021	2	1051089714
+-----+	+-----+	+-----+	+-----+
223   Kerala	2018	1	0
+-----+	+-----+	+-----+	+-----+
224   Kerala	2018	2	0
+-----+	+-----+	+-----+	+-----+
225   Kerala	2018	3	0
+-----+	+-----+	+-----+	+-----+
226   Kerala	2018	4	0
+-----+	+-----+	+-----+	+-----+
227   Kerala	2019	1	0
+-----+	+-----+	+-----+	+-----+
228   Kerala	2019	2	8673220
+-----+	+-----+	+-----+	+-----+
229   Kerala	2019	3	31471694
+-----+	+-----+	+-----+	+-----+
230   Kerala	2019	4	40046033
+-----+	+-----+	+-----+	+-----+
231   Kerala	2020	1	46396398
+-----+	+-----+	+-----+	+-----+
232   Kerala	2020	2	45832953
+-----+	+-----+	+-----+	+-----+
233   Kerala	2020	3	64309022
+-----+	+-----+	+-----+	+-----+
234   Kerala	2020	4	91415273
+-----+	+-----+	+-----+	+-----+
235   Kerala	2021	1	108918733
+-----+	+-----+	+-----+	+-----+
236   Kerala	2021	2	87814415
+-----+	+-----+	+-----+	+-----+
237   Ladakh	2018	1	0
+-----+	+-----+	+-----+	+-----+

238   Ladakh	2018	2	0
+-----+	+-----+	+-----+	+-----+
239   Ladakh	2018	3	0
+-----+	+-----+	+-----+	+-----+
240   Ladakh	2018	4	0
+-----+	+-----+	+-----+	+-----+
241   Ladakh	2019	1	0
+-----+	+-----+	+-----+	+-----+
242   Ladakh	2019	2	157317
+-----+	+-----+	+-----+	+-----+
243   Ladakh	2019	3	503126
+-----+	+-----+	+-----+	+-----+
244   Ladakh	2019	4	470440
+-----+	+-----+	+-----+	+-----+
245   Ladakh	2020	1	590484
+-----+	+-----+	+-----+	+-----+
246   Ladakh	2020	2	695673
+-----+	+-----+	+-----+	+-----+
247   Ladakh	2020	3	1015680
+-----+	+-----+	+-----+	+-----+
248   Ladakh	2020	4	1232757
+-----+	+-----+	+-----+	+-----+
249   Ladakh	2021	1	1184204
+-----+	+-----+	+-----+	+-----+
250   Ladakh	2021	2	4391632
+-----+	+-----+	+-----+	+-----+
251   Lakshadweep	2018	1	0
+-----+	+-----+	+-----+	+-----+
252   Lakshadweep	2018	2	0
+-----+	+-----+	+-----+	+-----+
253   Lakshadweep	2018	3	0
+-----+	+-----+	+-----+	+-----+
254   Lakshadweep	2018	4	0
+-----+	+-----+	+-----+	+-----+
255   Lakshadweep	2019	1	0
+-----+	+-----+	+-----+	+-----+
256   Lakshadweep	2019	2	4580
+-----+	+-----+	+-----+	+-----+
257   Lakshadweep	2019	3	15038
+-----+	+-----+	+-----+	+-----+
258   Lakshadweep	2019	4	17760
+-----+	+-----+	+-----+	+-----+
259   Lakshadweep	2020	1	21982
+-----+	+-----+	+-----+	+-----+
260   Lakshadweep	2020	2	29202
+-----+	+-----+	+-----+	+-----+
261   Lakshadweep	2020	3	32128
+-----+	+-----+	+-----+	+-----+
262   Lakshadweep	2020	4	41144
+-----+	+-----+	+-----+	+-----+
263   Lakshadweep	2021	1	47283
+-----+	+-----+	+-----+	+-----+
264   Lakshadweep	2021	2	40301
+-----+	+-----+	+-----+	+-----+
265   Madhya Pradesh	2018	1	0
+-----+	+-----+	+-----+	+-----+
266   Madhya Pradesh	2018	2	0
+-----+	+-----+	+-----+	+-----+
267   Madhya Pradesh	2018	3	0
+-----+	+-----+	+-----+	+-----+

268   Madhya Pradesh	2018	4	0
+-----+	+-----+	+-----+	+-----+
269   Madhya Pradesh	2019	1	0
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270   Madhya Pradesh	2019	2	50642151
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271   Madhya Pradesh	2019	3	192353380
+-----+	+-----+	+-----+	+-----+
272   Madhya Pradesh	2019	4	237844976
+-----+	+-----+	+-----+	+-----+
273   Madhya Pradesh	2020	1	262452480
+-----+	+-----+	+-----+	+-----+
274   Madhya Pradesh	2020	2	253770044
+-----+	+-----+	+-----+	+-----+
275   Madhya Pradesh	2020	3	324850994
+-----+	+-----+	+-----+	+-----+
276   Madhya Pradesh	2020	4	405571446
+-----+	+-----+	+-----+	+-----+
277   Madhya Pradesh	2021	1	482500276
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278   Maharashtra	2018	1	0
+-----+	+-----+	+-----+	+-----+
280   Maharashtra	2018	2	0
+-----+	+-----+	+-----+	+-----+
281   Maharashtra	2018	3	0
+-----+	+-----+	+-----+	+-----+
282   Maharashtra	2018	4	0
+-----+	+-----+	+-----+	+-----+
283   Maharashtra	2019	1	0
+-----+	+-----+	+-----+	+-----+
284   Maharashtra	2019	2	109967705
+-----+	+-----+	+-----+	+-----+
285   Maharashtra	2019	3	439998413
+-----+	+-----+	+-----+	+-----+
286   Maharashtra	2019	4	543654112
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287   Maharashtra	2020	1	615146568
+-----+	+-----+	+-----+	+-----+
288   Maharashtra	2020	2	506354812
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289   Maharashtra	2020	3	668197101
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290   Maharashtra	2020	4	952006770
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291   Maharashtra	2021	1	1101976484
+-----+	+-----+	+-----+	+-----+
292   Maharashtra	2021	2	1208083592
+-----+	+-----+	+-----+	+-----+
293   Manipur	2018	1	0
+-----+	+-----+	+-----+	+-----+
294   Manipur	2018	2	0
+-----+	+-----+	+-----+	+-----+
295   Manipur	2018	3	0
+-----+	+-----+	+-----+	+-----+
296   Manipur	2018	4	0
+-----+	+-----+	+-----+	+-----+
297   Manipur	2019	1	0
+-----+	+-----+	+-----+	+-----+

298   Manipur	2019	2	464829
+-----+	+-----+	+-----+	+-----+
299   Manipur	2019	3	1594205
+-----+	+-----+	+-----+	+-----+
300   Manipur	2019	4	1855488
+-----+	+-----+	+-----+	+-----+
301   Manipur	2020	1	2175642
+-----+	+-----+	+-----+	+-----+
302   Manipur	2020	2	3011491
+-----+	+-----+	+-----+	+-----+
303   Manipur	2020	3	3552375
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304   Manipur	2020	4	3783432
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305   Manipur	2021	1	3709227
+-----+	+-----+	+-----+	+-----+
306   Manipur	2021	2	7269002
+-----+	+-----+	+-----+	+-----+
307   Meghalaya	2018	1	0
+-----+	+-----+	+-----+	+-----+
308   Meghalaya	2018	2	0
+-----+	+-----+	+-----+	+-----+
309   Meghalaya	2018	3	0
+-----+	+-----+	+-----+	+-----+
310   Meghalaya	2018	4	0
+-----+	+-----+	+-----+	+-----+
311   Meghalaya	2019	1	0
+-----+	+-----+	+-----+	+-----+
312   Meghalaya	2019	2	395764
+-----+	+-----+	+-----+	+-----+
313   Meghalaya	2019	3	1387814
+-----+	+-----+	+-----+	+-----+
314   Meghalaya	2019	4	1490542
+-----+	+-----+	+-----+	+-----+
315   Meghalaya	2020	1	1716211
+-----+	+-----+	+-----+	+-----+
316   Meghalaya	2020	2	2205253
+-----+	+-----+	+-----+	+-----+
317   Meghalaya	2020	3	2384534
+-----+	+-----+	+-----+	+-----+
318   Meghalaya	2020	4	2745917
+-----+	+-----+	+-----+	+-----+
319   Meghalaya	2021	1	2939026
+-----+	+-----+	+-----+	+-----+
320   Meghalaya	2021	2	7290804
+-----+	+-----+	+-----+	+-----+
321   Mizoram	2018	1	0
+-----+	+-----+	+-----+	+-----+
322   Mizoram	2018	2	0
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323   Mizoram	2018	3	0
+-----+	+-----+	+-----+	+-----+
324   Mizoram	2018	4	0
+-----+	+-----+	+-----+	+-----+
325   Mizoram	2019	1	0
+-----+	+-----+	+-----+	+-----+
326   Mizoram	2019	2	133025
+-----+	+-----+	+-----+	+-----+
327   Mizoram	2019	3	457834
+-----+	+-----+	+-----+	+-----+

328   Mizoram	2019	4	529168
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329   Mizoram	2020	1	644683
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330   Mizoram	2020	2	739308
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331   Mizoram	2020	3	924865
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332   Mizoram	2020	4	1096182
+---+	+---+	+---+	+---+
333   Mizoram	2021	1	1193214
+---+	+---+	+---+	+---+
334   Mizoram	2021	2	4014597
+---+	+---+	+---+	+---+
335   Nagaland	2018	1	0
+---+	+---+	+---+	+---+
336   Nagaland	2018	2	0
+---+	+---+	+---+	+---+
337   Nagaland	2018	3	0
+---+	+---+	+---+	+---+
338   Nagaland	2018	4	0
+---+	+---+	+---+	+---+
339   Nagaland	2019	1	0
+---+	+---+	+---+	+---+
340   Nagaland	2019	2	362497
+---+	+---+	+---+	+---+
341   Nagaland	2019	3	1244022
+---+	+---+	+---+	+---+
342   Nagaland	2019	4	1454551
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343   Nagaland	2020	1	1684520
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344   Nagaland	2020	2	2119279
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345   Nagaland	2020	3	2868642
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346   Nagaland	2020	4	2922121
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347   Nagaland	2021	1	2980581
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348   Nagaland	2021	2	6716892
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349   Odisha	2018	1	0
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350   Odisha	2018	2	0
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351   Odisha	2018	3	0
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352   Odisha	2018	4	0
+---+	+---+	+---+	+---+
353   Odisha	2019	1	0
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354   Odisha	2019	2	33955545
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355   Odisha	2019	3	130181456
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356   Odisha	2019	4	189905719
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357   Odisha	2020	1	175918622
+---+	+---+	+---+	+---+

358   Odisha	2020	2	154682772
+-----+	+-----+	+-----+	+-----+
359   Odisha	2020	3	205597666
+-----+	+-----+	+-----+	+-----+
360   Odisha	2020	4	270085293
+-----+	+-----+	+-----+	+-----+
361   Odisha	2021	1	301315474
+-----+	+-----+	+-----+	+-----+
362   Odisha	2021	2	367576494
+-----+	+-----+	+-----+	+-----+
363   Puducherry	2018	1	0
+-----+	+-----+	+-----+	+-----+
364   Puducherry	2018	2	0
+-----+	+-----+	+-----+	+-----+
365   Puducherry	2018	3	0
+-----+	+-----+	+-----+	+-----+
366   Puducherry	2018	4	0
+-----+	+-----+	+-----+	+-----+
367   Puducherry	2019	1	0
+-----+	+-----+	+-----+	+-----+
368   Puducherry	2019	2	661932
+-----+	+-----+	+-----+	+-----+
369   Puducherry	2019	3	2476922
+-----+	+-----+	+-----+	+-----+
370   Puducherry	2019	4	3263122
+-----+	+-----+	+-----+	+-----+
371   Puducherry	2020	1	3820943
+-----+	+-----+	+-----+	+-----+
372   Puducherry	2020	2	3057608
+-----+	+-----+	+-----+	+-----+
373   Puducherry	2020	3	4222159
+-----+	+-----+	+-----+	+-----+
374   Puducherry	2020	4	6377136
+-----+	+-----+	+-----+	+-----+
375   Puducherry	2021	1	7914507
+-----+	+-----+	+-----+	+-----+
376   Puducherry	2021	2	5178916
+-----+	+-----+	+-----+	+-----+
377   Punjab	2018	1	0
+-----+	+-----+	+-----+	+-----+
378   Punjab	2018	2	0
+-----+	+-----+	+-----+	+-----+
379   Punjab	2018	3	0
+-----+	+-----+	+-----+	+-----+
380   Punjab	2018	4	0
+-----+	+-----+	+-----+	+-----+
381   Punjab	2019	1	0
+-----+	+-----+	+-----+	+-----+
382   Punjab	2019	2	10928094
+-----+	+-----+	+-----+	+-----+
383   Punjab	2019	3	40860886
+-----+	+-----+	+-----+	+-----+
384   Punjab	2019	4	47673880
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385   Punjab	2020	1	53853710
+-----+	+-----+	+-----+	+-----+
386   Punjab	2020	2	51289576
+-----+	+-----+	+-----+	+-----+
387   Punjab	2020	3	58946732
+-----+	+-----+	+-----+	+-----+

388   Punjab	2020	4	71191183
+-----+	+-----+	+-----+	+-----+
389   Punjab	2021	1	81052268
+-----+	+-----+	+-----+	+-----+
390   Punjab	2021	2	85894089
+-----+	+-----+	+-----+	+-----+
391   Rajasthan	2018	1	0
+-----+	+-----+	+-----+	+-----+
392   Rajasthan	2018	2	0
+-----+	+-----+	+-----+	+-----+
393   Rajasthan	2018	3	0
+-----+	+-----+	+-----+	+-----+
394   Rajasthan	2018	4	0
+-----+	+-----+	+-----+	+-----+
395   Rajasthan	2019	1	0
+-----+	+-----+	+-----+	+-----+
396   Rajasthan	2019	2	62787336
+-----+	+-----+	+-----+	+-----+
397   Rajasthan	2019	3	238338999
+-----+	+-----+	+-----+	+-----+
398   Rajasthan	2019	4	288904693
+-----+	+-----+	+-----+	+-----+
399   Rajasthan	2020	1	341815756
+-----+	+-----+	+-----+	+-----+
400   Rajasthan	2020	2	329941181
+-----+	+-----+	+-----+	+-----+
401   Rajasthan	2020	3	436682870
+-----+	+-----+	+-----+	+-----+
402   Rajasthan	2020	4	511015109
+-----+	+-----+	+-----+	+-----+
403   Rajasthan	2021	1	632535059
+-----+	+-----+	+-----+	+-----+
404   Rajasthan	2021	2	1072091232
+-----+	+-----+	+-----+	+-----+
405   Sikkim	2018	1	0
+-----+	+-----+	+-----+	+-----+
406   Sikkim	2018	2	0
+-----+	+-----+	+-----+	+-----+
407   Sikkim	2018	3	0
+-----+	+-----+	+-----+	+-----+
408   Sikkim	2018	4	0
+-----+	+-----+	+-----+	+-----+
409   Sikkim	2019	1	0
+-----+	+-----+	+-----+	+-----+
410   Sikkim	2019	2	398520
+-----+	+-----+	+-----+	+-----+
411   Sikkim	2019	3	1316804
+-----+	+-----+	+-----+	+-----+
412   Sikkim	2019	4	1552004
+-----+	+-----+	+-----+	+-----+
413   Sikkim	2020	1	1697163
+-----+	+-----+	+-----+	+-----+
414   Sikkim	2020	2	1912335
+-----+	+-----+	+-----+	+-----+
415   Sikkim	2020	3	2156470
+-----+	+-----+	+-----+	+-----+
416   Sikkim	2020	4	2478670
+-----+	+-----+	+-----+	+-----+
417   Sikkim	2021	1	2795331
+-----+	+-----+	+-----+	+-----+

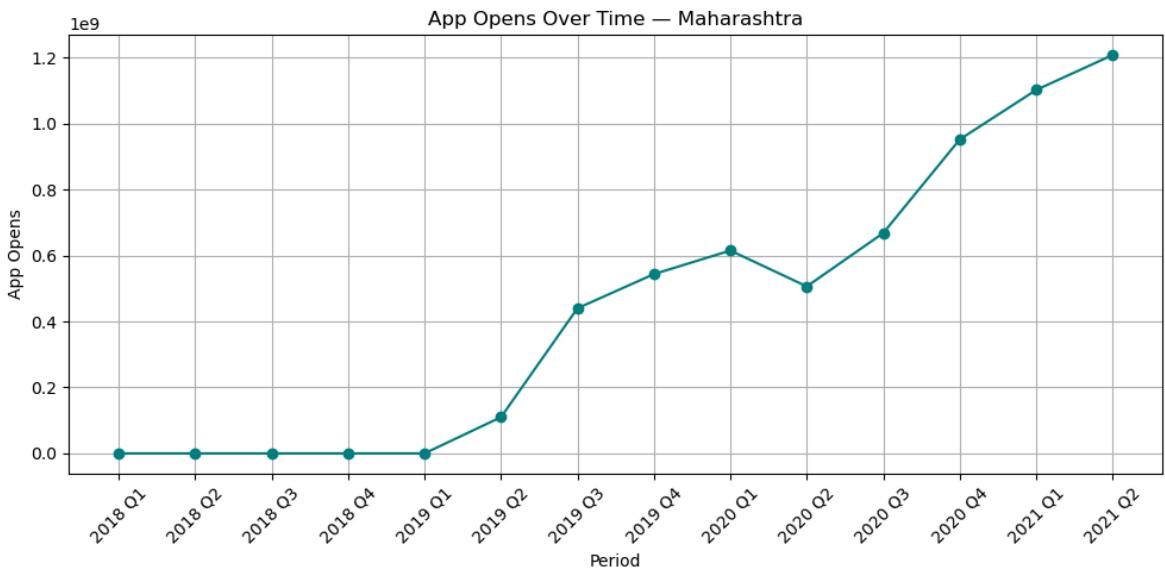
418   Sikkim	2021	2	4541121
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419   Tamil Nadu	2018	1	0
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420   Tamil Nadu	2018	2	0
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421   Tamil Nadu	2018	3	0
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422   Tamil Nadu	2018	4	0
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423   Tamil Nadu	2019	1	0
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424   Tamil Nadu	2019	2	33658961
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425   Tamil Nadu	2019	3	124690342
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426   Tamil Nadu	2019	4	155011717
+---+	+---+	+---+	+---+
427   Tamil Nadu	2020	1	179908753
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428   Tamil Nadu	2020	2	144907447
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429   Tamil Nadu	2020	3	194683284
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430   Tamil Nadu	2020	4	288233552
+---+	+---+	+---+	+---+
431   Tamil Nadu	2021	1	348801714
+---+	+---+	+---+	+---+
432   Tamil Nadu	2021	2	343968474
+---+	+---+	+---+	+---+
433   Telangana	2018	1	0
+---+	+---+	+---+	+---+
434   Telangana	2018	2	0
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435   Telangana	2018	3	0
+---+	+---+	+---+	+---+
436   Telangana	2018	4	0
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437   Telangana	2019	1	0
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438   Telangana	2019	2	80842302
+---+	+---+	+---+	+---+
439   Telangana	2019	3	318124511
+---+	+---+	+---+	+---+
440   Telangana	2019	4	399239044
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441   Telangana	2020	1	454723816
+---+	+---+	+---+	+---+
442   Telangana	2020	2	367130505
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443   Telangana	2020	3	527781925
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444   Telangana	2020	4	764614235
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445   Telangana	2021	1	920040042
+---+	+---+	+---+	+---+
446   Telangana	2021	2	905317692
+---+	+---+	+---+	+---+
447   Tripura	2018	1	0
+---+	+---+	+---+	+---+

448   Tripura	2018	2	0
+---+	+---+	+---+	+---+
449   Tripura	2018	3	0
+---+	+---+	+---+	+---+
450   Tripura	2018	4	0
+---+	+---+	+---+	+---+
451   Tripura	2019	1	0
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452   Tripura	2019	2	953627
+---+	+---+	+---+	+---+
453   Tripura	2019	3	3350991
+---+	+---+	+---+	+---+
454   Tripura	2019	4	3610807
+---+	+---+	+---+	+---+
455   Tripura	2020	1	4063223
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456   Tripura	2020	2	4443221
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457   Tripura	2020	3	5777908
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458   Tripura	2020	4	6017249
+---+	+---+	+---+	+---+
459   Tripura	2021	1	6009660
+---+	+---+	+---+	+---+
460   Tripura	2021	2	9500881
+---+	+---+	+---+	+---+
461   Uttar Pradesh	2018	1	0
+---+	+---+	+---+	+---+
462   Uttar Pradesh	2018	2	0
+---+	+---+	+---+	+---+
463   Uttar Pradesh	2018	3	0
+---+	+---+	+---+	+---+
464   Uttar Pradesh	2018	4	0
+---+	+---+	+---+	+---+
465   Uttar Pradesh	2019	1	0
+---+	+---+	+---+	+---+
466   Uttar Pradesh	2019	2	78394040
+---+	+---+	+---+	+---+
467   Uttar Pradesh	2019	3	268142606
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468   Uttar Pradesh	2019	4	324068625
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469   Uttar Pradesh	2020	1	374282083
+---+	+---+	+---+	+---+
470   Uttar Pradesh	2020	2	383703534
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471   Uttar Pradesh	2020	3	450784508
+---+	+---+	+---+	+---+
472   Uttar Pradesh	2020	4	552220798
+---+	+---+	+---+	+---+
473   Uttar Pradesh	2021	1	639718324
+---+	+---+	+---+	+---+
474   Uttar Pradesh	2021	2	673598864
+---+	+---+	+---+	+---+
475   Uttarakhand	2018	1	0
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476   Uttarakhand	2018	2	0
+---+	+---+	+---+	+---+
477   Uttarakhand	2018	3	0
+---+	+---+	+---+	+---+

478   Uttarakhand	2018	4	0
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479   Uttarakhand	2019	1	0
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480   Uttarakhand	2019	2	7454279
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481   Uttarakhand	2019	3	24660988
+---+	+---+	+---+	+---+
482   Uttarakhand	2019	4	28853867
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483   Uttarakhand	2020	1	32631265
+---+	+---+	+---+	+---+
484   Uttarakhand	2020	2	31074793
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485   Uttarakhand	2020	3	40377348
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486   Uttarakhand	2020	4	52564888
+---+	+---+	+---+	+---+
487   Uttarakhand	2021	1	59282260
+---+	+---+	+---+	+---+
488   Uttarakhand	2021	2	78380036
+---+	+---+	+---+	+---+
489   West Bengal	2018	1	0
+---+	+---+	+---+	+---+
490   West Bengal	2018	2	0
+---+	+---+	+---+	+---+
491   West Bengal	2018	3	0
+---+	+---+	+---+	+---+
492   West Bengal	2018	4	0
+---+	+---+	+---+	+---+
493   West Bengal	2019	1	0
+---+	+---+	+---+	+---+
494   West Bengal	2019	2	49514201
+---+	+---+	+---+	+---+
495   West Bengal	2019	3	176559011
+---+	+---+	+---+	+---+
496   West Bengal	2019	4	244326613
+---+	+---+	+---+	+---+
497   West Bengal	2020	1	207068218
+---+	+---+	+---+	+---+
498   West Bengal	2020	2	198589332
+---+	+---+	+---+	+---+
499   West Bengal	2020	3	246554831
+---+	+---+	+---+	+---+
500   West Bengal	2020	4	291721919
+---+	+---+	+---+	+---+
501   West Bengal	2021	1	316832674
+---+	+---+	+---+	+---+
502   West Bengal	2021	2	275341466
+---+	+---+	+---+	+---+

```
In [35]: # 2. Identify trends in app usage by creating a line plot showing the number of
selected_state = 'Maharashtra'
state_data = app_usage_summary[app_usage_summary['State'] == selected_state]
state_data = state_data.copy()
state_data['Period'] = state_data['Year'].astype(str) + ' Q' + state_data['Quart
plt.figure(figsize=(10,5))
plt.plot(state_data['Period'], state_data['App Opens'], marker='o', color='teal'
```

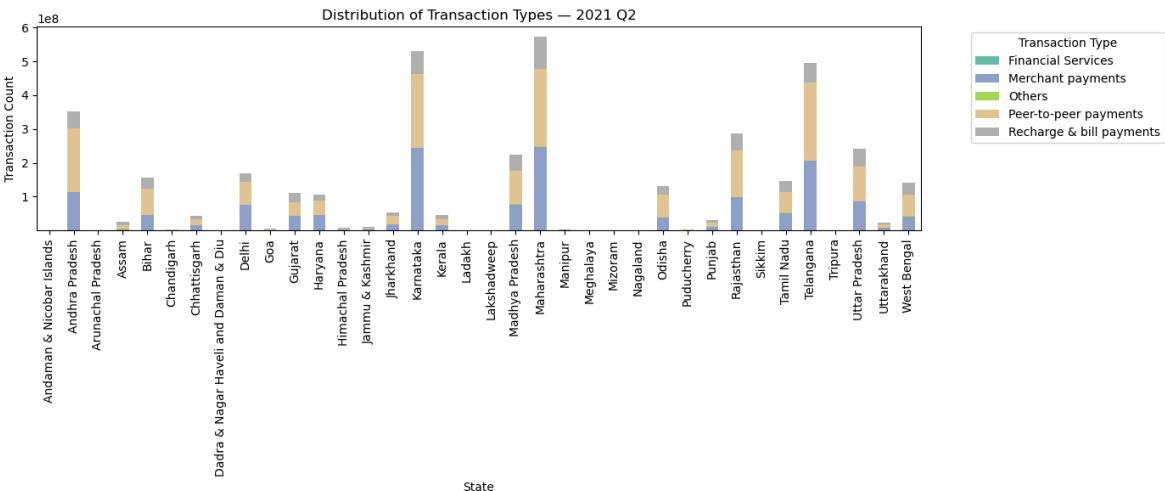
```
plt.title(f'App Opens Over Time - {selected_state}')
plt.xlabel('Period')
plt.ylabel('App Opens')
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```



```
In [36]: # Distribution of transaction types
# 1. Create a bar chart showing the distribution of different transaction types
latest_year = state_txn_split['Year'].max()
latest_quarter = state_txn_split[state_txn_split["Year"] == latest_year][["Quarter"]]
latest_df = state_txn_split[(state_txn_split["Year"] == latest_year) & (state_txn_split["Quarter"] == latest_quarter[0])]

pivot = latest_df.pivot_table(index='State', columns='Transaction Type', values='Count')

ax = pivot.plot(kind='bar', stacked=True, figsize=(14,6), colormap='Set2')
plt.title(f'Distribution of Transaction Types — {latest_year} Q{latest_quarter[0]}')
plt.ylabel('Transaction Count')
plt.xlabel('State')
plt.xticks(rotation=90)
plt.legend(title='Transaction Type', bbox_to_anchor=(1.05, 1), loc='upper left')
plt.tight_layout()
plt.show()
```



```
In [37]: # Find unique mapping between district name and district code
# 1. Identify the unique mapping between district names and district codes from
district_map = district_demo[['District', 'Code']].drop_duplicates()

# 2. Create a CSV file containing the unique district name and district code map
# 3. Export the CSV file.
district_map.to_csv("district_mapping.csv", index = False)
```

```
In [38]: #Task 3: Data Quality Checks
# 3.1: Ensure data consistency across state and district levels
# 1. For each state, calculate the total number of transactions, total transaction
# by summing up the values from the district level data.

district_agg = district_txn_users.groupby('State')[['Transactions', 'Amount (INR)']]
district_agg.rename(columns={
    'Transactions': 'District Transactions',
    'Amount (INR)': 'District Amount',
    'Registered Users': 'District Users'
}, inplace=True)

state_agg = state_txn_users.groupby('State')[['Transactions', 'Amount (INR)', 'Reg
state_agg.rename(columns={
    'Transactions': 'State Transactions',
    'Amount (INR)': 'State Amount',
    'Registered Users': 'State Users'
}, inplace=True)
```

```
In [39]: # 2. Compare the results with the corresponding values at the state level to ens
merged_df = pd.merge(district_agg, state_agg, on = 'State')
merged_df['Txn Mismatch'] = merged_df['District Transactions'] != merged_df['Sta
merged_df['Amount Mismatch'] = ~np.isclose(merged_df['District Amount'], merged_
merged_df['Users Mismatch'] = merged_df['District Users'] != merged_df['State Us

discrepancies = merged_df[(merged_df['Txn Mismatch']) | (merged_df['Amount Misma
```

```
In [40]: # 3. Display any discrepancies found between the district-level and state-level
discrepancies
```

Out[40]:

	State	District Transactions	District Amount	District Users	State Transactions	State Amount	State Users
1	Andhra Pradesh	1781091169	3.860292e+12	158007957	1491343199	3.187847e+12	13964
2	Arunachal Pradesh	8043799	2.225183e+10	1861689	8043799	2.225183e+10	186

```
In [41]: # Task 4: Data Merging and Advanced Analysis
# 4.1: Ratio of users to population by state
# 1. Merge the State Txn and Users dataset with the District Demographics dataset
# to the population for each state.

state_users = state_txn_users.groupby('State')['Registered Users'].sum().reset_index()
state_population = district_demo.groupby('State')['Population'].sum().reset_index()

merged = pd.merge(state_users, state_population, on = 'State')
merged['User-population Ratio'] = merged['Registered Users']/merged['Population']
```

```
print(" Ratio of Registered Users to Population by State")
print(tabulate(merged[['State', 'Registered Users', 'Population', 'User-population ratio'],
                      headers='keys', tablefmt='grid', floatfmt=".4f"]))
```

## Ratio of Registered Users to Population by State

	State	Registered Users	Population
User-population Ratio			
0   Andaman & Nicobar Islands 1.0731		408396	380581
1   Andhra Pradesh 2.8280		139644224	49378776
2   Arunachal Pradesh 1.1595		1862214	1606047
3   Assam 0.7794		26860751	34461385
4   Bihar 1.1105		115284760	103817951
5   Chandigarh 3.6017		3801466	1055450
6   Chhattisgarh 1.4477		37448388	25867958
7   Dadra & Nagar Haveli and Daman & Diu 4.6019		2701112	586956
8   Delhi 5.6811		95374654	16787941
9   Goa 3.2622		4755320	1457723
10   Gujarat 1.9169		126380032	65930328
11   Haryana 3.3093		85564119	25855357
12   Himachal Pradesh 1.9506		13373980	6856509
13   Jammu & Kashmir		9756438	12258093

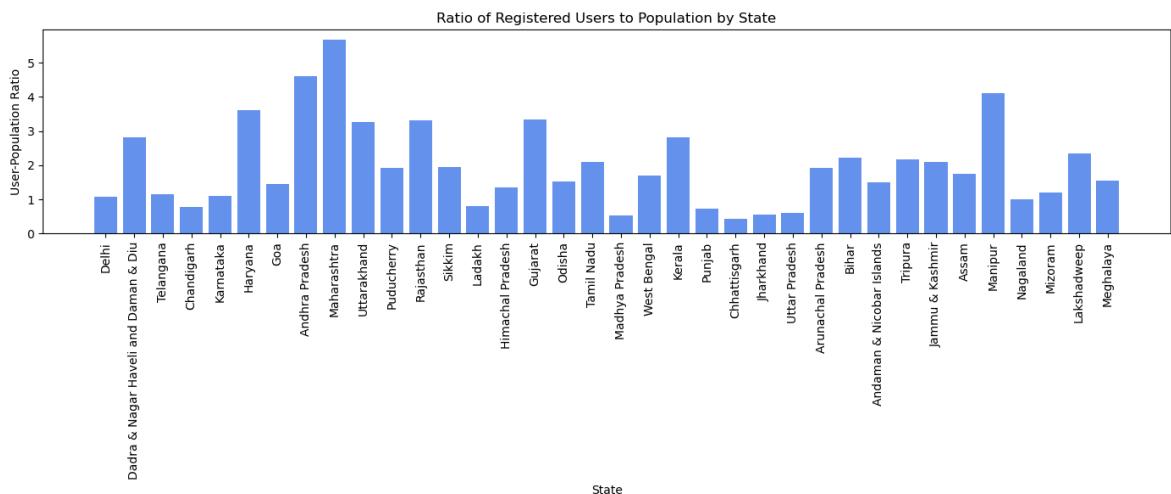
0.7959			
+---+-----+-----+-----+			
14   Jharkhand	44768682	32966238	
1.3580			
+---+-----+-----+-----+			
15   Karnataka	203098564	60965960	
3.3313			
+---+-----+-----+-----+			
16   Kerala	51267042	33387677	
1.5355			
+---+-----+-----+-----+			
17   Ladakh	579825	276875	
2.0942			
+---+-----+-----+-----+			
18   Lakshadweep	34223	64473	
0.5308			
+---+-----+-----+-----+			
19   Madhya Pradesh	125339823	73943914	
1.6951			
+---+-----+-----+-----+			
20   Maharashtra	315783658	112378989	
2.8100			
+---+-----+-----+-----+			
21   Manipur	2317734	3187465	
0.7271			
+---+-----+-----+-----+			
22   Meghalaya	1436472	3364915	
0.4269			
+---+-----+-----+-----+			
23   Mizoram	605612	1091014	
0.5551			
+---+-----+-----+-----+			
24   Nagaland	1440387	2335175	
0.6168			
+---+-----+-----+-----+			
25   Odisha	80404103	41947358	
1.9168			
+---+-----+-----+-----+			
26   Puducherry	2785162	1247953	
2.2318			
+---+-----+-----+-----+			
27   Punjab	45811761	30510873	
1.5015			
+---+-----+-----+-----+			
28   Rajasthan	149770064	68620629	

2.1826			
+---+-----+-----+			
29   Sikkim		1279199	607688
2.1050			
+---+-----+-----+			
30   Tamil Nadu		132437426	76018492
1.7422			
+---+-----+-----+			
31   Telangana		149224214	36366570
4.1033			
+---+-----+-----+			
32   Tripura		3661575	3671032
0.9974			
+---+-----+-----+			
33   Uttar Pradesh		246200404	205867440
1.1959			
+---+-----+-----+			
34   Uttarakhand		23792747	10116752
2.3518			
+---+-----+-----+			
35   West Bengal		144242183	92828987
1.5538			
+---+-----+-----+			

In [42]: # 2. Create a column chart depicting the ratio of users to population by state.

```
merged_df = merged.sort_values('User-population Ratio', ascending=False)

plt.figure(figsize=(14,6))
plt.bar(merged_df['State'], merged['User-population Ratio'], color='cornflowerblue')
plt.xticks(rotation=90)
plt.title('Ratio of Registered Users to Population by State')
plt.xlabel('State')
plt.ylabel('User-Population Ratio')
plt.tight_layout()
plt.show()
```



```
In [43]: # 4.2: Correlate population density with transaction volume
# 1. Merge the District Txn and Users dataset with the District Demographics data

merged_district = pd.merge(district_txn_users,district_demo, on= ['State','District'])
merged_district.head()
```

Out[43]:

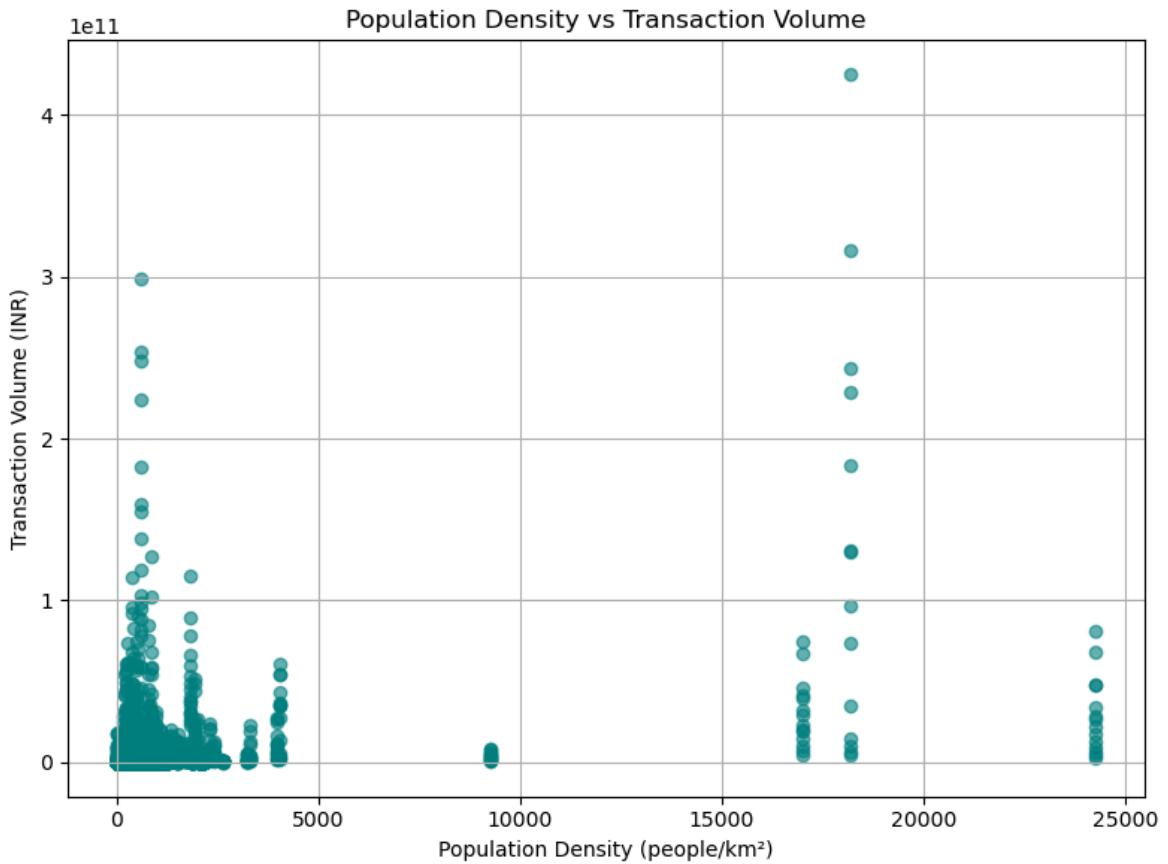
	State	Year	Quarter	District	Code_x	Transactions	Amount (INR)	ATV (INR)
0	Andaman & Nicobar Islands	2018	1	South Andaman	AN03	5688	1.256025e+07	2208.201361
1	Andaman & Nicobar Islands	2018	2	South Andaman	AN03	9395	2.394824e+07	2549.040502
2	Andaman & Nicobar Islands	2018	3	South Andaman	AN03	13511	4.426811e+07	3276.449742
3	Andaman & Nicobar Islands	2018	4	South Andaman	AN03	20136	7.541184e+07	3745.125189
4	Andaman & Nicobar Islands	2019	1	South Andaman	AN03	25683	8.550197e+07	3329.127142



```
In [44]: #2. Calculate the correlation between population density and transaction volume
correlation = merged_district['Density'].corr(merged_district['Amount (INR)'])
print(correlation)
```

0.33676543179108975

```
In [45]: #3. Create a scatter plot to visualize the correlation between population density and transaction volume
plt.figure(figsize=(8,6))
plt.scatter(merged_district['Density'], merged_district['Amount (INR)'], alpha=0.5)
plt.title('Population Density vs Transaction Volume')
plt.xlabel('Population Density (people/km²)')
plt.ylabel('Transaction Volume (INR)')
plt.grid(True)
plt.tight_layout()
plt.show()
```



```
In [46]: # 4.3: Average transaction amount per user
# 1. Merge relevant datasets to calculate the average transaction amount per user
agg_df = state_txn_users.groupby('State')[['Amount (INR)', 'Registered Users']].sum()
agg_df['ATV'] = agg_df['Amount (INR)'] / agg_df['Registered Users']

print("Average Transaction Amount per User by State")
print(tabulate(agg_df[['State', 'Amount (INR)', 'Registered Users', 'ATV']], headers='keys', tablefmt='grid', floatfmt=".2f"))
```

## Average Transaction Amount per User by State

rs	State	Amount (INR)	Registered Use
96	ATV		
0	Andaman & Nicobar Islands	3641817860.75	4083
24	22828.35		
1	Andhra Pradesh	3187847468851.51	1396442
14	11949.13		
2	Arunachal Pradesh	22251830956.91	18622
51	10476.58		
3	Assam	281408712657.44	268607
60	14221.99		
4	Bihar	1639578926751.51	1152847
66	14129.31		
5	Chandigarh	53712084630.82	38014
88	11098.88		
6	Chhattisgarh	415635319208.15	374483
12	18658784568.34		27011
7	Dadra & Nagar Haveli and Daman & Diu		
54	6907.82		
8	Delhi	1649942211116.08	953746
20	17299.59		
9	Goa	44271871113.09	47553
32	9309.97		
10	Gujarat	1105328681946.77	1263800
19	8746.07		
11	Haryana	1059831565199.82	855641
19	12386.40		
12	Himachal Pradesh	97865455329.56	133739
80	7317.60		
13	Jammu & Kashmir	109495435910.39	97564

38   11222.89		
14   Jharkhand	490570131446.52	447686
82   10957.89		
15   Karnataka	4361395878908.12	2030985
64   21474.28		
16   Kerala	372959870819.69	512670
42   7274.85		
17   Ladakh	6606978450.50	5798
25   11394.78		
18   Lakshadweep	192158684.67	342
23   5614.90		
19   Madhya Pradesh	1915100967832.55	1253398
23   15279.27		
20   Maharashtra	4290995253332.02	3157836
58   13588.40		
21   Manipur	35793251136.46	23177
34   15443.21		
22   Meghalaya	12541621895.08	14364
72   8730.85		
23   Mizoram	6317141434.55	6056
12   10431.00		
24   Nagaland	16387572679.28	14403
87   11377.20		
25   Odisha	1220614556987.25	804041
03   15181.00		
26   Puducherry	32097692614.55	27851
62   11524.53		
27   Punjab	394177285102.20	458117
61   8604.28		
28   Rajasthan	2625584351280.98	1497700

64		17530.77				
+-----+			+-----+			
-+-----+			-+-----+			
29   Sikkim			14155544437.92			12791
99   11065.94						
+-----+			+-----+			
-+-----+			-+-----+			
30   Tamil Nadu			1481448044165.06			1324374
26   11186.02						
+-----+			+-----+			
-+-----+			-+-----+			
31   Telangana			4574245879737.88			1492242
14   30653.51						
+-----+			+-----+			
-+-----+			-+-----+			
32   Tripura			20970514761.53			36615
75   5727.18						
+-----+			+-----+			
-+-----+			-+-----+			
33   Uttar Pradesh			2399757104087.38			2462004
04   9747.17						
+-----+			+-----+			
-+-----+			-+-----+			
34   Uttarakhand			215071471849.20			237927
47   9039.37						
+-----+			+-----+			
-+-----+			-+-----+			
35   West Bengal			1452706824854.87			1442421
83   10071.30						
+-----+			+-----+			
-+-----+			-+-----+			

```
In [47]: # 2. Identify the top 5 states with the highest average transaction amount per user
# Lowest average transaction amount per user.
agg_df.sort_values(by = 'ATV', ascending = False, inplace = True)

top_5 = agg_df.head(5)
print("Top 5 States by Avg Transaction Amount per User")
print(tabulate(top_5[['State', 'ATV']], headers='keys', tablefmt='grid', floatfmt='%.2f'))

# Bottom 5
bottom_5 = agg_df.tail(5)
print("\n Bottom 5 States by Avg Transaction Amount per User")
print(tabulate(bottom_5[['State', 'ATV']], headers='keys', tablefmt='grid', floatfmt='%.2f'))
```

Top 5 States by Avg Transaction Amount per User

	State	ATV
31	Telangana	30653.51
1	Andhra Pradesh	22828.35
15	Karnataka	21474.28
28	Rajasthan	17530.77
8	Delhi	17299.59

Bottom 5 States by Avg Transaction Amount per User

	State	ATV
12	Himachal Pradesh	7317.60
16	Kerala	7274.85
7	Dadra & Nagar Haveli and Daman & Diu	6907.82
32	Tripura	5727.18
18	Lakshadweep	5614.90

```
In [48]: # 4.4: Device brand usage ratio
# 1. Merge the State_DeviceData dataset with the State_Txn and Users dataset.
```

```
merge_df = pd.merge(state_device_data,state_txn_users, on=['State', 'Year', 'Quarter'])
merge_df.rename(columns={'Registered Users_x': 'Brand Users', 'Registered Users_y': 'All Users'}, inplace=True)
merge_df.head(5)
```

Out[48]:

	State	Year	Quarter	Brand	Brand Users	Percentage	Transactions	Amount (INR)
0	Andaman & Nicobar Islands	2018	1	Xiaomi	1665	0.247033	6658	1.463176e+07
1	Andaman & Nicobar Islands	2018	1	Samsung	1445	0.214392	6658	1.463176e+07
2	Andaman & Nicobar Islands	2018	1	Vivo	982	0.145697	6658	1.463176e+07
3	Andaman & Nicobar Islands	2018	1	Oppo	501	0.074332	6658	1.463176e+07
4	Andaman & Nicobar Islands	2018	1	OnePlus	332	0.049258	6658	1.463176e+07

In [49]:

```
# 2. Calculate the ratio of users using each device brand to the total number of
merge_df['Usage Ratio'] = merge_df['Brand Users']/merge_df['State Users']
merge_df = merge_df[['State', 'Year', 'Quarter', 'Brand', 'Brand Users', 'State

print("Device Brand Usage Ratio by State, Year, Quarter")
print(tabulate(merge_df[['State', 'Year', 'Quarter', 'Brand', 'Brand Users', 'St
headers='keys', tablefmt='grid', floatfmt=".4f"))
```

## Device Brand Usage Ratio by State, Year, Quarter

	State	Year	Quarter	Brand	Brand Users
	State Users	Usage Ratio			
0	Andaman & Nicobar Islands	2018	1	Xiaomi	1665
	6740	0.2470			
1	Andaman & Nicobar Islands	2018	1	Samsung	1445
	6740	0.2144			
2	Andaman & Nicobar Islands	2018	1	Vivo	982
	6740	0.1457			
3	Andaman & Nicobar Islands	2018	1	Oppo	501
	6740	0.0743			
4	Andaman & Nicobar Islands	2018	1	OnePlus	332
	6740	0.0493			
5	Andaman & Nicobar Islands	2018	1	Realme	316
	6740	0.0469			
6	Andaman & Nicobar Islands	2018	1	Apple	229
	6740	0.0340			
7	Andaman & Nicobar Islands	2018	1	Motorola	226
	6740	0.0335			
8	Andaman & Nicobar Islands	2018	1	Lenovo	202
	6740	0.0300			
9	Andaman & Nicobar Islands	2018	1	Huawei	158
	6740	0.0234			
10	Andaman & Nicobar Islands	2018	1	Others	684
	6740	0.1015			
11	Andaman & Nicobar Islands	2018	2	Xiaomi	2303
	9405	0.2449			
12	Andaman & Nicobar Islands	2018	2	Samsung	1923
	9405	0.2045			
13	Andaman & Nicobar Islands	2018	2	Vivo	1523

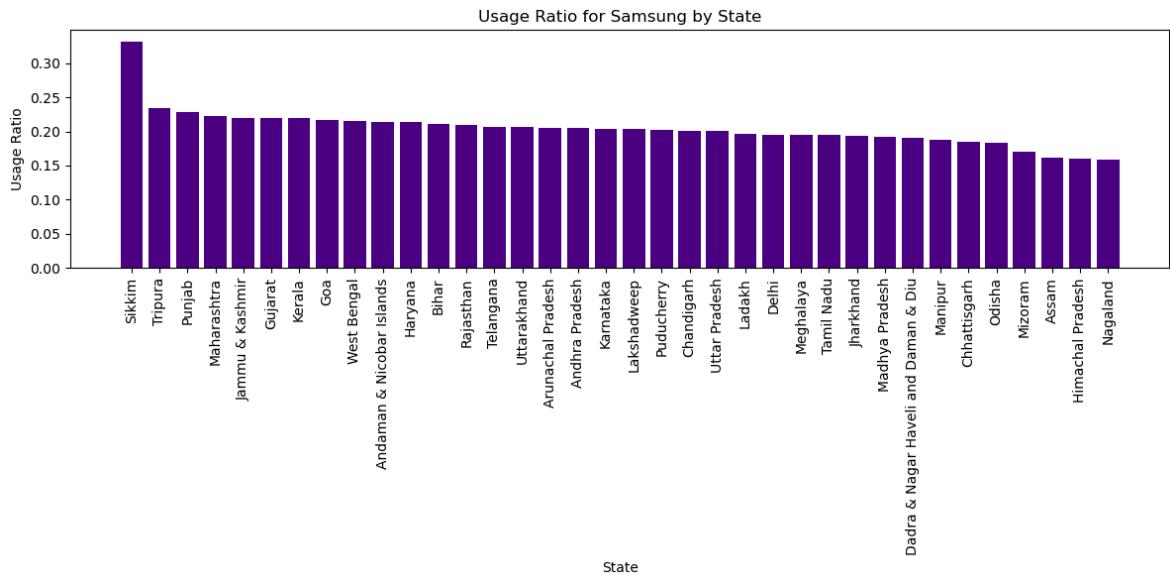
	9405	0.1619				
14	Andaman & Nicobar Islands	2018	2	Oppo		708
	9405	0.0753				
15	Andaman & Nicobar Islands	2018	2	OnePlus		466
	9405	0.0495				
16	Andaman & Nicobar Islands	2018	2	Realme		465
	9405	0.0494				
17	Andaman & Nicobar Islands	2018	2	Motorola		319
	9405	0.0339				
18	Andaman & Nicobar Islands	2018	2	Apple		308
	9405	0.0327				
19	Andaman & Nicobar Islands	2018	2	Lenovo		244
	9405	0.0259				
20	Andaman & Nicobar Islands	2018	2	Huawei		230
	9405	0.0245				
21	Andaman & Nicobar Islands	2018	2	Others		916
	9405	0.0974				
22	Andaman & Nicobar Islands	2018	3	Xiaomi		2950
	12149	0.2428				
23	Andaman & Nicobar Islands	2018	3	Samsung		2409
	12149	0.1983				
24	Andaman & Nicobar Islands	2018	3	Vivo		2063
	12149	0.1698				
25	Andaman & Nicobar Islands	2018	3	Oppo		988
	12149	0.0813				
26	Andaman & Nicobar Islands	2018	3	OnePlus		617
	12149	0.0508				
27	Andaman & Nicobar Islands	2018	3	Realme		603
	12149	0.0496				
28	Andaman & Nicobar Islands	2018	3	Motorola		390

	12149	0.0321				
+	+	+	+	+	+	+
29   Andaman & Nicobar Islands   2018   3   Apple   371						
12149   0.0305						
+	+	+	+	+	+	+
30   Andaman & Nicobar Islands   2018   3   Huawei   314						
12149   0.0258						
+	+	+	+	+	+	+
31   Andaman & Nicobar Islands   2018   3   Lenovo   299						
12149   0.0246						
+	+	+	+	+	+	+
32   Andaman & Nicobar Islands   2018   3   Others   1145						
12149   0.0942						
+	+	+	+	+	+	+
33   Andaman & Nicobar Islands   2018   4   Xiaomi   3719						
15222   0.2443						
+	+	+	+	+	+	+
34   Andaman & Nicobar Islands   2018   4   Samsung   2936						
15222   0.1929						
+	+	+	+	+	+	+
35   Andaman & Nicobar Islands   2018   4   Vivo   2742						
15222   0.1801						
+	+	+	+	+	+	+
36   Andaman & Nicobar Islands   2018   4   Oppo   1268						
15222   0.0833						
+	+	+	+	+	+	+
37   Andaman & Nicobar Islands   2018   4   Realme   760						
15222   0.0499						
+	+	+	+	+	+	+
38   Andaman & Nicobar Islands   2018   4   OnePlus   721						
15222   0.0474						
+	+	+	+	+	+	+
39   Andaman & Nicobar Islands   2018   4   Motorola   474						
15222   0.0311						
+	+	+	+	+	+	+
40   Andaman & Nicobar Islands   2018   4   Apple   455						
15222   0.0299						
+	+	+	+	+	+	+
41   Andaman & Nicobar Islands   2018   4   Huawei   398						
15222   0.0261						
+	+	+	+	+	+	+
42   Andaman & Nicobar Islands   2018   4   Lenovo   377						
15222   0.0248						
+	+	+	+	+	+	+
43   Andaman & Nicobar Islands   2018   4   Others   1372						

	15222		0.0901			
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
44   Andaman & Nicobar Islands   2019   1   Xiaomi   4576						
18596   0.2461						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
45   Andaman & Nicobar Islands   2019   1   Samsung   3567						
18596   0.1918						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
46   Andaman & Nicobar Islands   2019   1   Vivo   3420						
18596   0.1839						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
47   Andaman & Nicobar Islands   2019   1   Oppo   1600						
18596   0.0860						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
48   Andaman & Nicobar Islands   2019   1   Realme   897						
18596   0.0482						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						
49   Andaman & Nicobar Islands   2019   1   OnePlus   855						
18596   0.0460						
+-----+-----+-----+-----+-----+-----+						
+-----+-----+						

```
In [50]: # 3. Create a bar chart depicting the device brand usage ratio for each state.
selected_brand = 'Samsung'
brand_data = merge_df[merge_df['Brand'] == selected_brand].copy()
brand_data.sort_values('Usage Ratio', ascending=False, inplace=True)

# Plot bar chart
plt.figure(figsize=(12,6))
plt.bar(brand_data['State'], brand_data['Usage Ratio'], color='indigo')
plt.xticks(rotation=90)
plt.title(f'Usage Ratio for {selected_brand} by State')
plt.xlabel('State')
plt.ylabel('Usage Ratio')
plt.tight_layout()
plt.show()
```



In [51]:

```
#Task 5: Data Visualization
# 5.1: Plot the total transactions and amount over time for a selected state
# 1. Create a line plot showing the total number of transactions and the total t

selected_State = 'Maharashtra'
state_data = state_txn_users[state_txn_users['State'] == selected_State].copy()

state_data['Period'] = state_data['Year'].astype(str) + ' Q' + state_data['Quart
state_data = state_data.sort_values(['Year', 'Quarter'])
state_data = state_data[['Period', 'Transactions', 'Amount (INR)']]

print(tabulate(state_data[['Period', 'Transactions', 'Amount (INR)']], headers=''
```

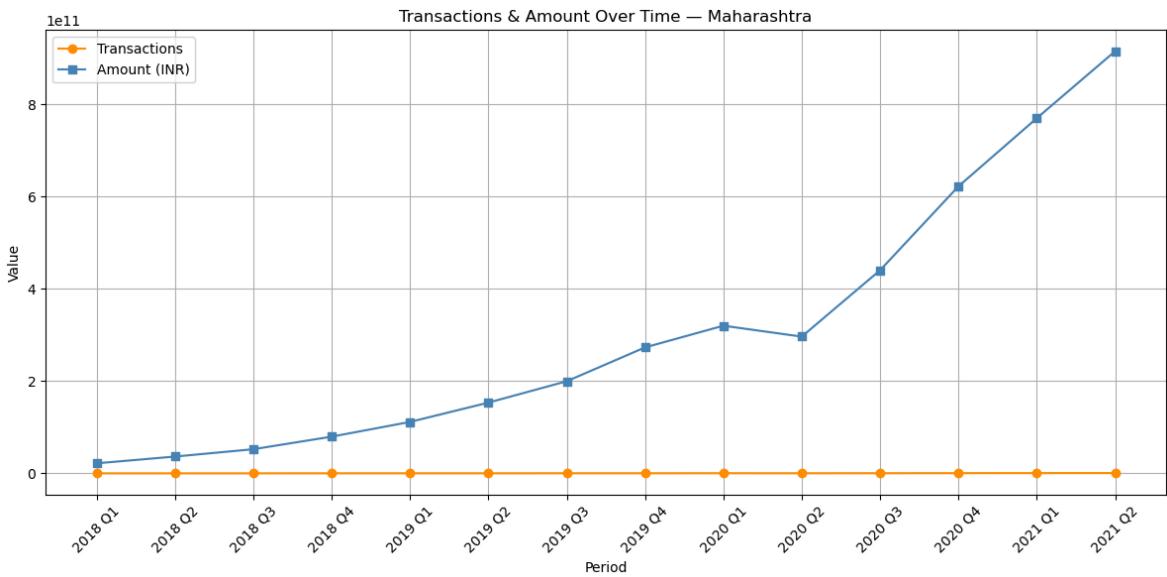
	Period	Transactions	Amount (INR)
280	2018 Q1	16387034	2.17116e+10
281	2018 Q2	22285740	3.63571e+10
282	2018 Q3	31538538	5.22608e+10
283	2018 Q4	46090223	7.95189e+10
284	2019 Q1	75079069	1.11421e+11
285	2019 Q2	101149853	1.53294e+11
286	2019 Q3	148735581	1.99618e+11
287	2019 Q4	201260620	2.72994e+11
288	2020 Q1	238944081	3.19995e+11
289	2020 Q2	184790761	2.9636e+11
290	2020 Q3	268310924	4.40307e+11
291	2020 Q4	407621004	6.22156e+11
292	2021 Q1	517860240	7.69887e+11
293	2021 Q2	573616486	9.15115e+11

```
In [52]: plt.figure(figsize=(12,6))

# Plot Transactions
plt.plot(state_data['Period'], state_data['Transactions'], marker='o', label='Transactions')

# Plot Amount
plt.plot(state_data['Period'], state_data['Amount (INR)'], marker='s', label='Amount')

plt.title(f'Transactions & Amount Over Time - {selected_state}')
plt.xlabel('Period')
plt.ylabel('Value')
plt.xticks(rotation=45)
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```



```
In [53]: # 5.2: Create a pie chart showing the distribution of transaction types for a specific state, year, and quarter.
# 1. Create a pie chart showing the distribution of different transaction types

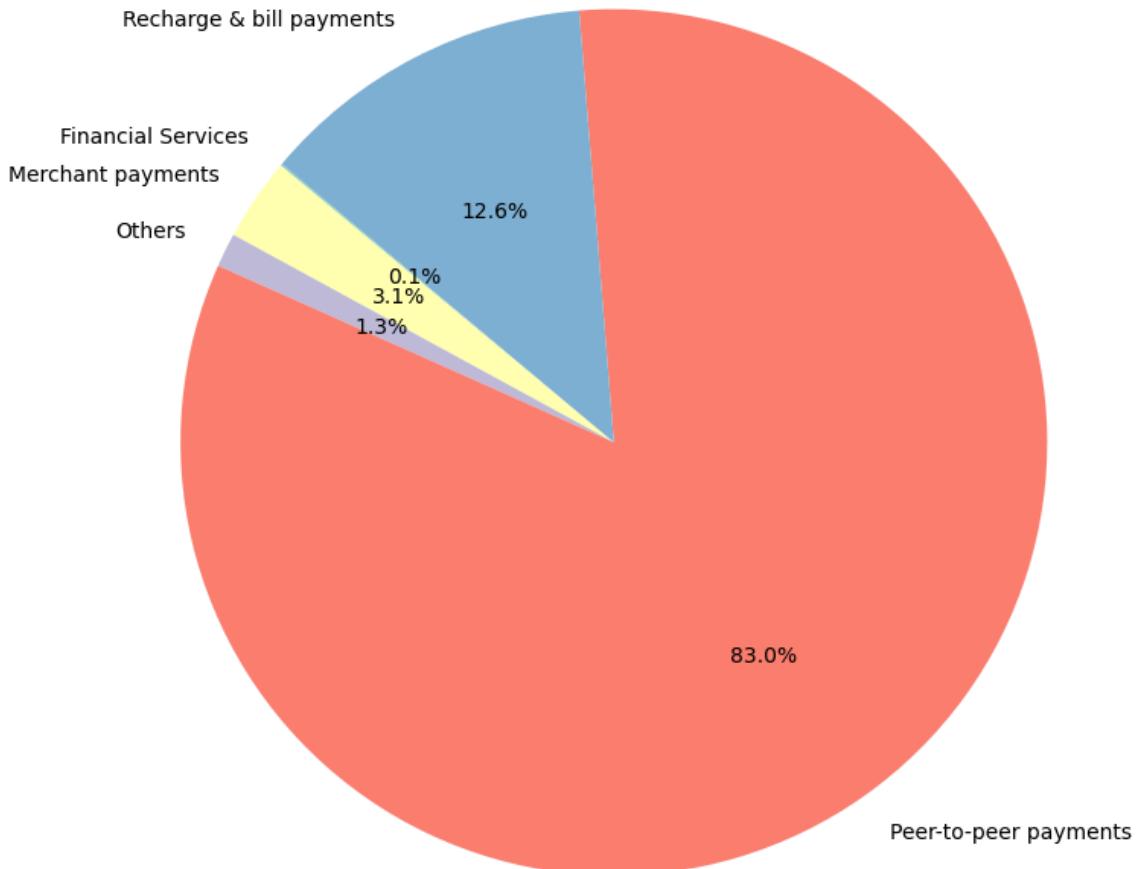
selected_state = 'Andaman & Nicobar Islands'
selected_year = 2018
selected_quarter = 1

filtered_df = state_txn_split[
    (state_txn_split['State'] == selected_state) &
    (state_txn_split['Year'] == selected_year) &
    (state_txn_split['Quarter'] == selected_quarter)
]

txn_summary = filtered_df.groupby('Transaction Type')['Amount (INR)'].sum()

plt.figure(figsize=(8,8))
plt.pie(txn_summary, labels=txn_summary.index, autopct='%1.1f%%',
        startangle=140, colors=plt.cm.Set3.colors)
plt.title(f'Transaction Type Distribution - {selected_state}, Q{selected_quarter}')
plt.tight_layout()
plt.show()
```

## Transaction Type Distribution — Andaman &amp; Nicobar Islands, Q1 2018



```
In [54]: # 5.3: Visualize the population density of districts in a selected state
# 1. Create a bar plot showing the population density of districts in a selected
# Select state
selected_state = 'Maharashtra'

# Filter districts for the selected state
state_districts = district_demo[district_demo['State'] == selected_state].copy()

# Sort by density (optional)
state_districts = state_districts.sort_values('Density', ascending=False)

plt.figure(figsize=(16,6))
plt.bar(state_districts['District'], state_districts['Density'], color='darkcyan')
plt.xticks(rotation=45)
plt.title(f'Population Density of Districts - {selected_state}')
plt.xlabel('District')
plt.ylabel('Population Density (people/km²)')
plt.tight_layout()
plt.grid(axis='y', linestyle='--', alpha=0.5)
plt.show()
```

