Analysis of Indian District Courts

Name: Meghana Tedla

Roll No: 2021102002

Objective:

The main objective of the task was to explore and analyze the database of ~80 million Indian district courts across the states. To explore the data and come up with insights about the data.

Dataset:

The database provided was about 80 million district courts across the different states of India.

The database consists of different data sets.

Acts and Sections	Cases	Judges	Keys
This data frame consists of information about the acts and sections of each case.	There is data for cases from 2010 to 2018 and each year's cases have the following information: ➢ State code ➢ District code ➢ Court number ➢ Cino ➢ Judge position ➢ No. of female defendants ➢ No. of female petitioners ➢ No. of advocate for defender ➢ No. of female advocate for petitioner ➢ Type name ➢ Purpose name ➢ Disposition name ➢ Date of filing ➢ Date of decision ➢ Date of first listing ➢ Date of last listing ➢ Date of next listing	Information of judges across the country. Information provided: ➢ State code ➢ District code ➢ Court number ➢ Judge position ➢ Gender ➢ Start date ➢ End date	Keys are used to establish and identify relationships between tables and to uniquely identify any record or row of data inside a table. The keys provided are: ➢ Description of each act ➢ Description of each section ➢ State code and state name ➢ District code for a state and district name ➢ Court number and court name ➢ Disposition name ➢ Purpose name ➢ Type name ➢ Case id and filing, decision judge

Approach:

- The approach towards analyzing the given data base was to build a complete ecosystem of judge's data, cases data, acts and sections using the relational keys provided.
- To build a data set that consists of all the information provided about each case.
- To merge the data given about each case and the judges, cases and courts, cases and districts, cases and states, cases and acts, states and judges to get a bigger picture of the provided data base. Merging the data to create a bigger data set is to get better understanding of the relation between the different attributes.

Sample Data sets derived:

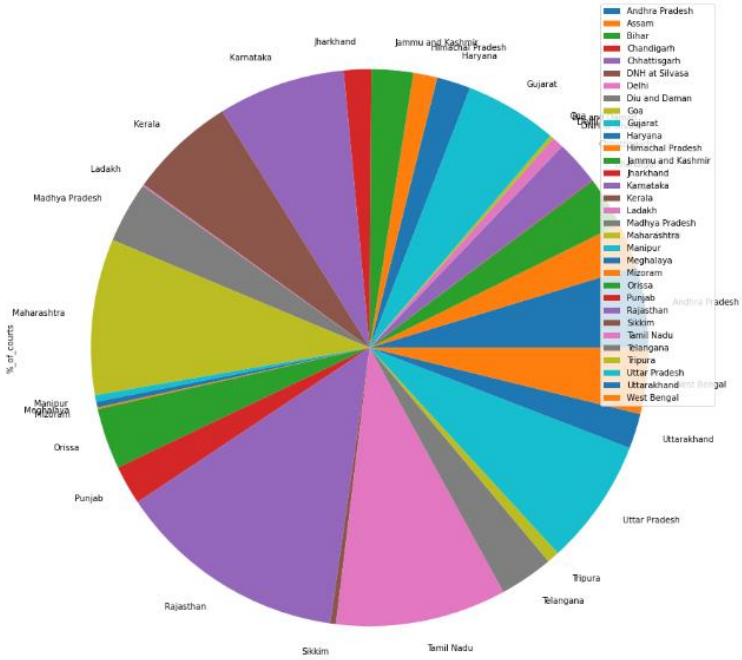
I. 5 years of data (2014 to 2018)
II. States, districts, courts, and judges
III. States, districts, courts, and cases
IV. Cases and disposition

Analysis 1:

1. *Percentage of courts in each state*

state_name	%_of_courts
Andhra Pradesh	4.705378
Assam	2.617277
Bihar	2.903318
Chandigarh	0.042906
Chhattisgarh	2.588673
DNH at Silvasa	0.014302
Delhi	0.657895
Diu and Daman	0.028604
Goa	0.214531
Gujarat	5.363272
Haryana	1.959382
Himachal Pradesh	1.387300
Jammu and Kashmir	2.417048
Jharkhand	1.587529
Karnataka	7.379863
Kerala	6.178490
Ladakh	0.085812
Madhya Pradesh	3.546911
Maharashtra	9.053204
Manipur	0.386156
Meghalaya	0.328947
Mizoram	0.100114
Orissa	3.532609
Punjab	2.274027
Rajasthan	13.386728
Sikkim	0.328947
Tamil Nadu	9.897025
Telangana	3.117849
Tripura	0.715103
Uttar Pradesh	7.336957
Uttarakhand	2.030892
West Bengal	3.832952

Pie chart depicting the percentage of courts in each state

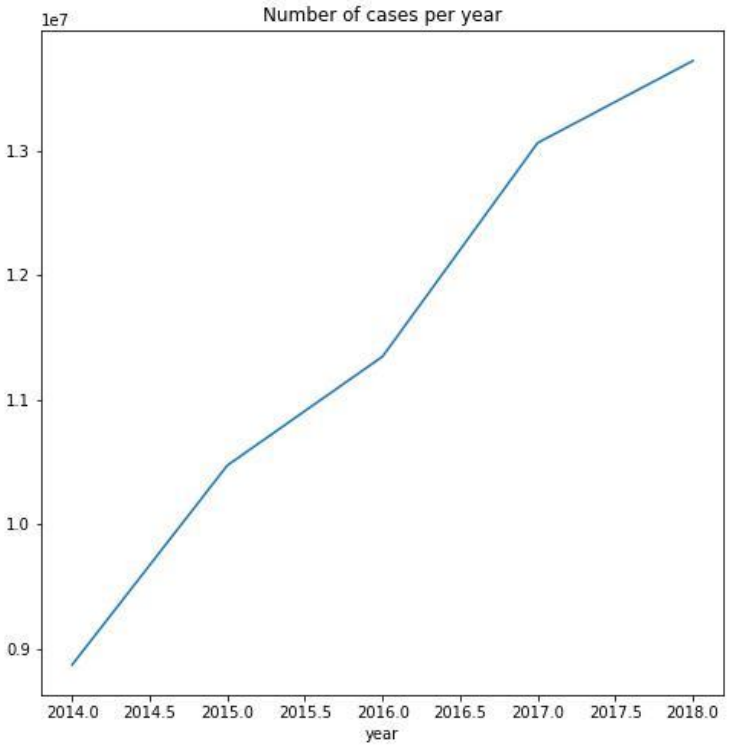


2. *Year wise trend of number of cases*

The number of cases per year was computed by merging the case data from 2014 to 2018.

This is to understand the trend of number of cases being filed per year.

	count
	ddl_case_id
year	
2014	8874616
2015	10475876
2016	11349260
2017	13065513
2018	13724299



year	Case Count	% increase in Cases	India's Population	No. of Cases for every 1L cases
2014	8874616		1,307,246,509	678.8785389
2015	10475876	15%	1,322,866,505	791.9072681
2016	11349260	8%	1,338,636,340	847.8224937
2017	13065513	13%	1,354,195,680	964.8172116
2018	13724299	5%	1,369,003,306	1002.502984

- Comparing this data to the population of India every year we can say that per year, on an average 850 people for every 1 lakh people have filed a case.
- The number of cases filed have increased by 35% from 2014 to 2018.
- The trend observed is that there is an increase of cases each year by an average of 10%.

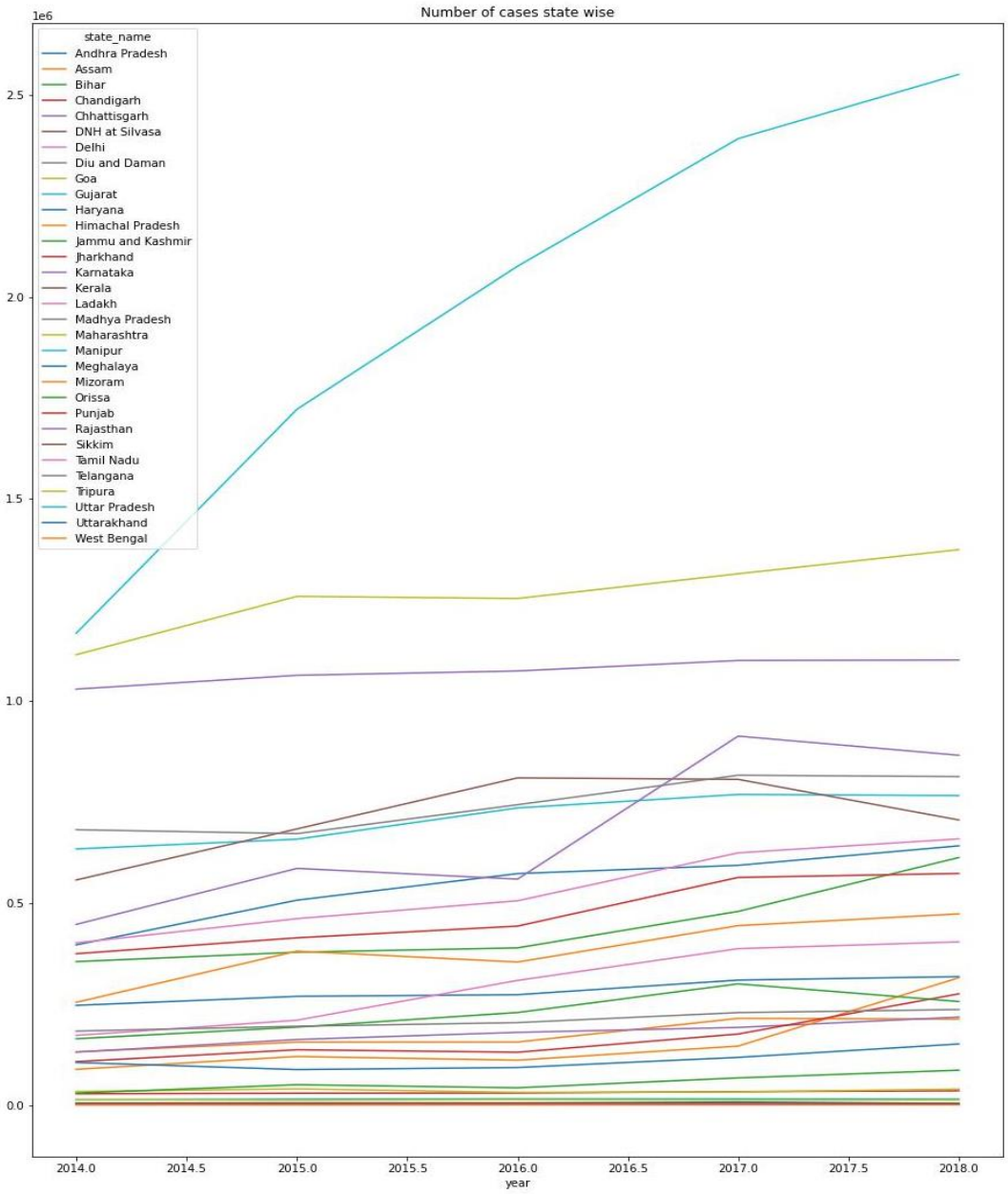
3. *Year wise trend of number of cases for each state*

By taking a subset of the last 5 years cases data and merging it with the state and district keys we can get information of states and the cases filed.

From this we can derive the count of cases per state and observe the trend.

state_name	Andhra Pradesh	Assam	Bihar	Chandigarh	Chhattisgarh	DNH at Silvasa	Delhi	Diu and Daman	Goa	Gujarat
year										
2014	246828	131610	355055	27899	131190	1069	172409	990	33592	633923
2015	269049	155744	378305	29257	162186	1261	209976	1581	40025	658015
2016	273082	155943	389051	29782	179927	1006	308537	1589	31481	735394
2017	309346	214503	479259	33211	192181	903	387146	1558	32446	768727
2018	317917	212765	612675	35242	217706	1298	403869	1644	39453	765934

Plotting a line graph gives a more graphical understanding of the trend of cases across the different states.



Sum of ddl_case_id	Column Labels															
State Wise	Andhra Pradesh	Delhi	Goa	Gujarat	Himachal Pradesh	Jammu and Kashmir	Jharkhand	Karnataka	Ladakh	Madhya Pradesh	Manipur	Meghalaya	Sikkim	Telangana	Tripura	Uttar Pradesh
Y2014	246828	172409	33592	633923	88507	29587	107528	1029441	27	681486	13019	4890	4911	183129	13701	1167900
Y2015	269049	209976	40025	658015	120239	50341	136885	1063633	58	671773	14851	5482	4732	195023	12127	1721962
Y2016	273082	308537	31481	735394	110985	42756	130751	1074358	128	743362	15727	5260	5075	204123	13772	2076121
Y2017	309346	387146	32446	768727	146048	67300	175810	1100310	247	816343	15548	7588	4561	228752	12566	2391896
Y2018	317917	403869	39453	765934	315195	86291	275310	1101515	433	812987	14821	4038	4078	236422	12430	2550912
Grand Total	**1416222**	**1481937**	**176997**	**3561993**	**780974**	**276275**	**826284**	**5369257**	**893**	**3725951**	**73966**	**27258**	**23357**	**1047449**	**64596**	**9908791**
	22%	57%	15%	17%	72%	66%	61%	7%	94%	16%	12%	-21%	-20%	23%	-10%	54%

- From the above graph it can be observed that Uttar Pradesh has the highest number of cases while Ladakh has the least number for all years between 2014 and 2018.
- States like Delhi, Himachal Pradesh, Jammu and Kashmir, Jharkhand and Ladakh have seen a huge increase in the number of cases relatively from 2014 to 2018.
- Meghalaya, Sikkim, and Tripura have had a drop in the number of cases from 2014 to 2018.
- Karnataka, Manipur, Goa, Gujarat, Madhya Pradesh have had very little increase in cases.
- On an average the number of cases per state have increased by 35%.

Analysis2:

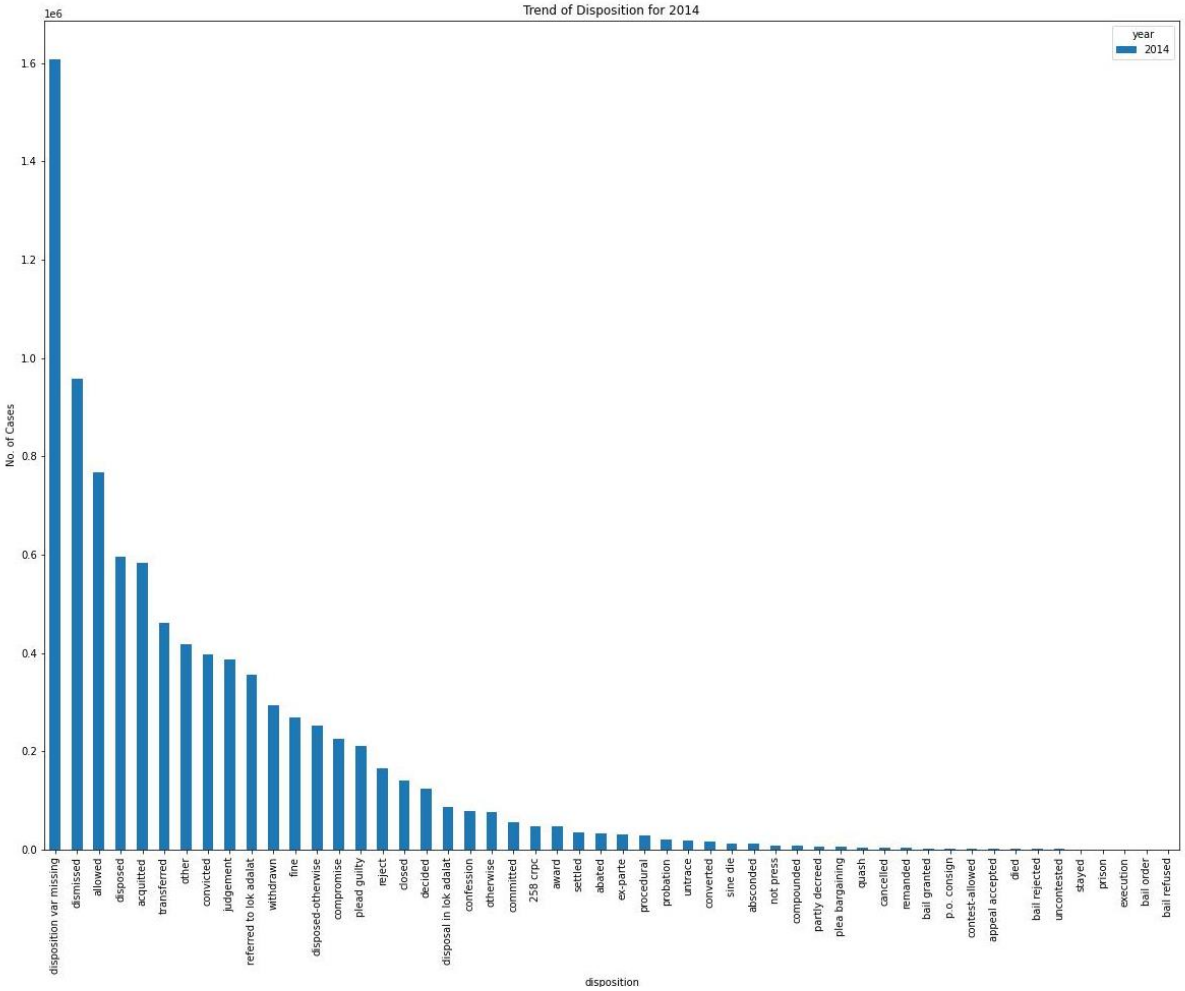
The disposition trend for cases per year was obtained by merging the case data from 2014 to 2018 and the disposition key to get a detailed information about the disposition and to see how cased filed in the different district courts have been disposed.

Disposition is the status or final outcome of a prosecution.

4. *Trend of disposition of cases in 2014*

Top ten dispositions in the year 2014

disp_name_s	
disposition var missing	1607071
dismissed	957554
allowed	767580
disposed	596847
acquitted	584050
transferred	461920
other	417764
convicted	397669
judgement	386075
referred to lok adalat	355052

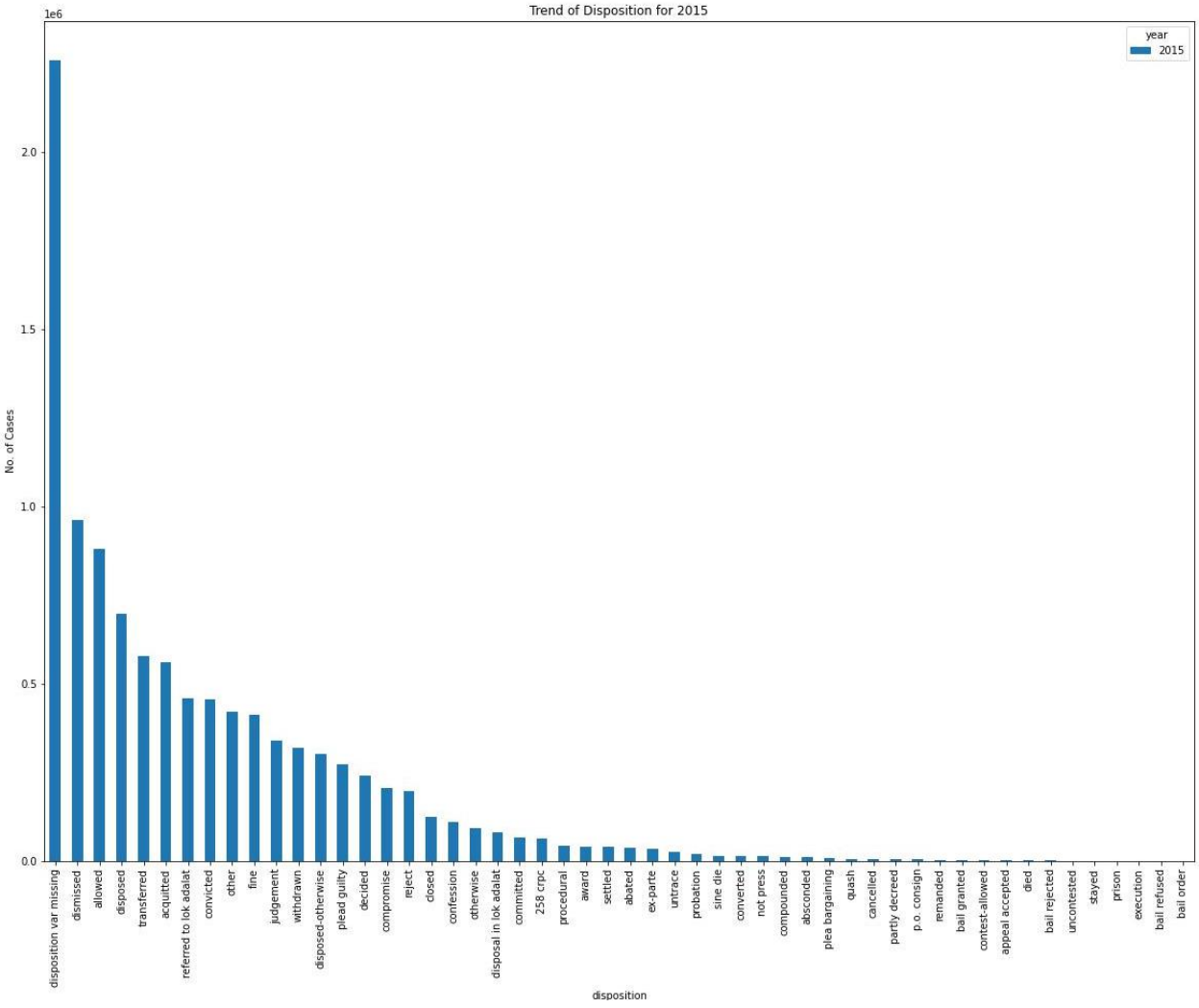


- In 2014 most cases had the disposition-var-missing.
- Excluding the cases with the disposition var missing, most cases were disposed as ‘dismissed’.

5. *Trend of disposition of cases in 2015*

Top ten dispositions in the year 2015

year	2015
disp_name_s	
disposition var missing	2259042
dismissed	961444
allowed	881581
disposed	698398
transferred	580169
acquitted	562171
referred to lok adalat	459290
convicted	455331
other	422885
fine	414331



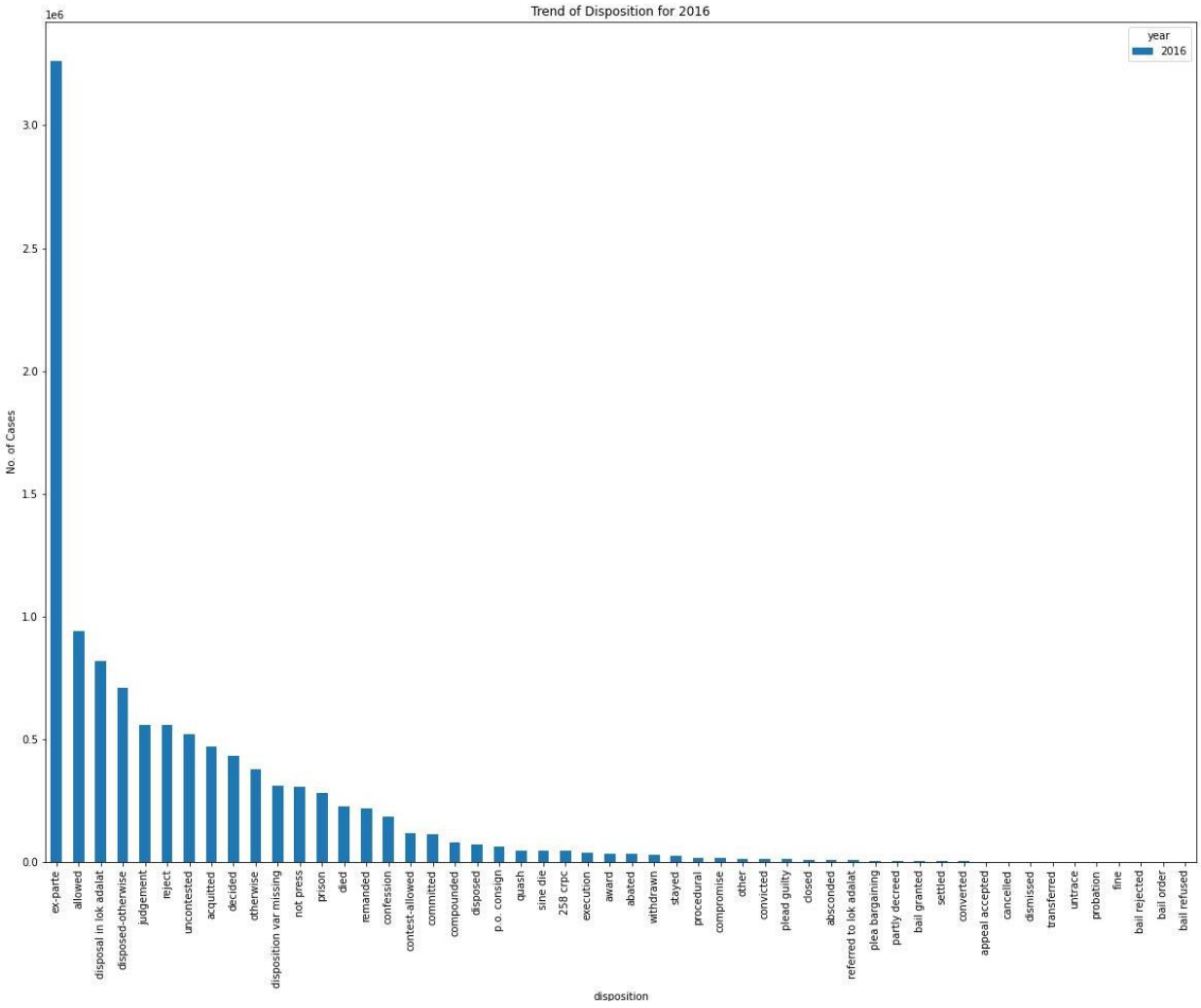
- In 2015 as well most cases had the disposition-var-missing.
- Excluding the cases with the disposition var missing, most cases were disposed as ‘dismissed’.
- Comparing 2014 and 2015 data we observe that in 2015, the number of cases ‘transferred’ is more than the number of cases ‘acquitted’.
- The number of cases with disposition ‘referred to Lok Adalat’ and ‘convicted’ have also increased from 2014 to 2015.

6. *Trend of disposition of cases in 2016*

Top ten dispositions in the year 2016

year	2016
disp_name_s	
ex-parte	3260488
allowed	938736
disposal in lok adalat	820324
disposed-otherwise	711040
judgement	558296
reject	557311
uncontested	518583
acquitted	471271
decided	432004
otherwise	379463

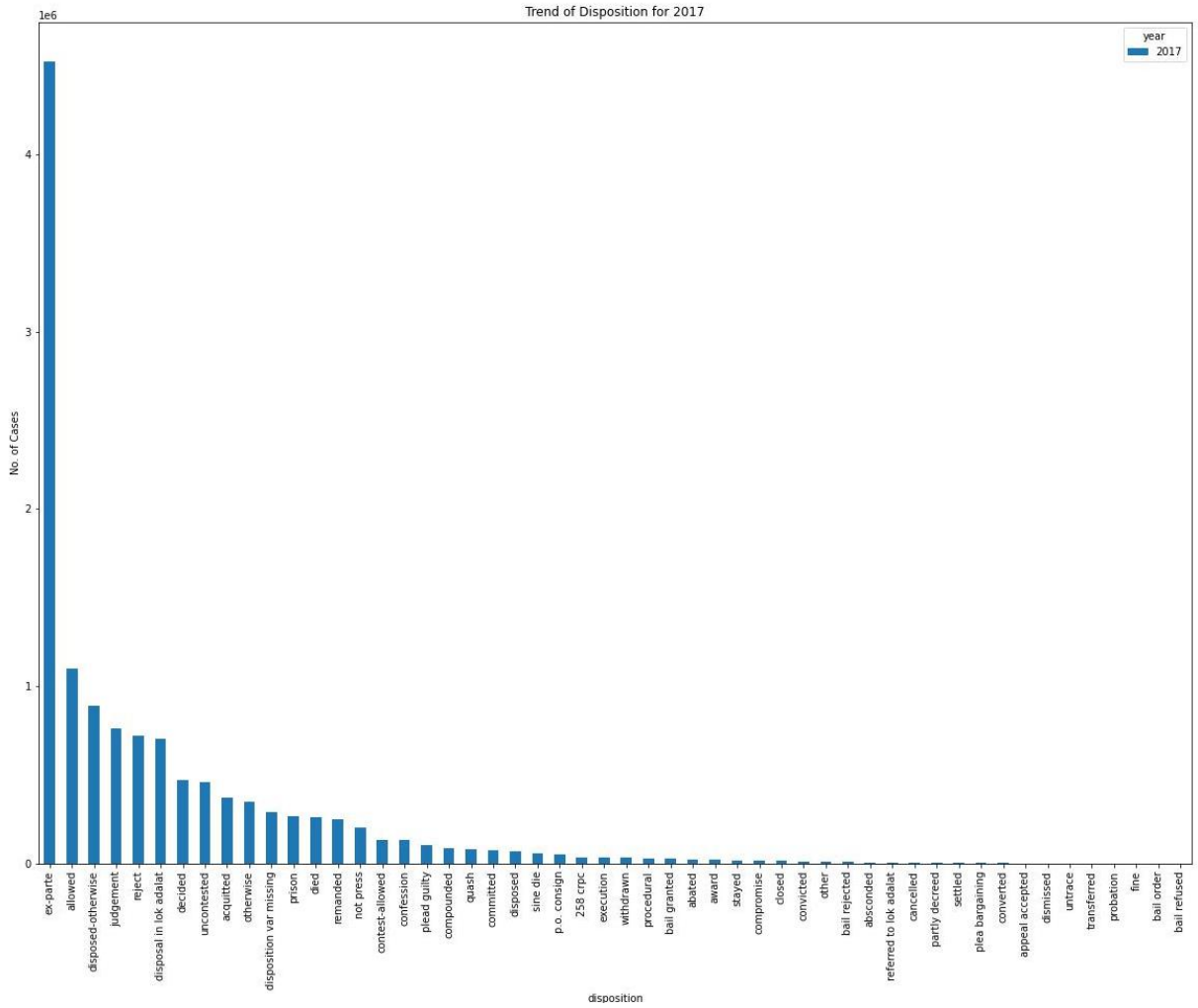
- In 2016 most cases were disposed as ‘ex-parte’.
- Next highest being ‘allowed’ and ‘disposal in Lok Adalat’.
- The number of cases ‘acquitted’ have dropped again from 2015 to 2016.



7. *Trend of disposition of cases in 2017*

Top ten dispositions in the year 2017

year	2017
disp_name_s	
ex-parte	4521012
allowed	1101941
disposed-otherwise	892083
judgement	763001
reject	720854
disposal in lok adalat	706392
decided	474365
uncontested	457022
acquitted	371770
otherwise	350352

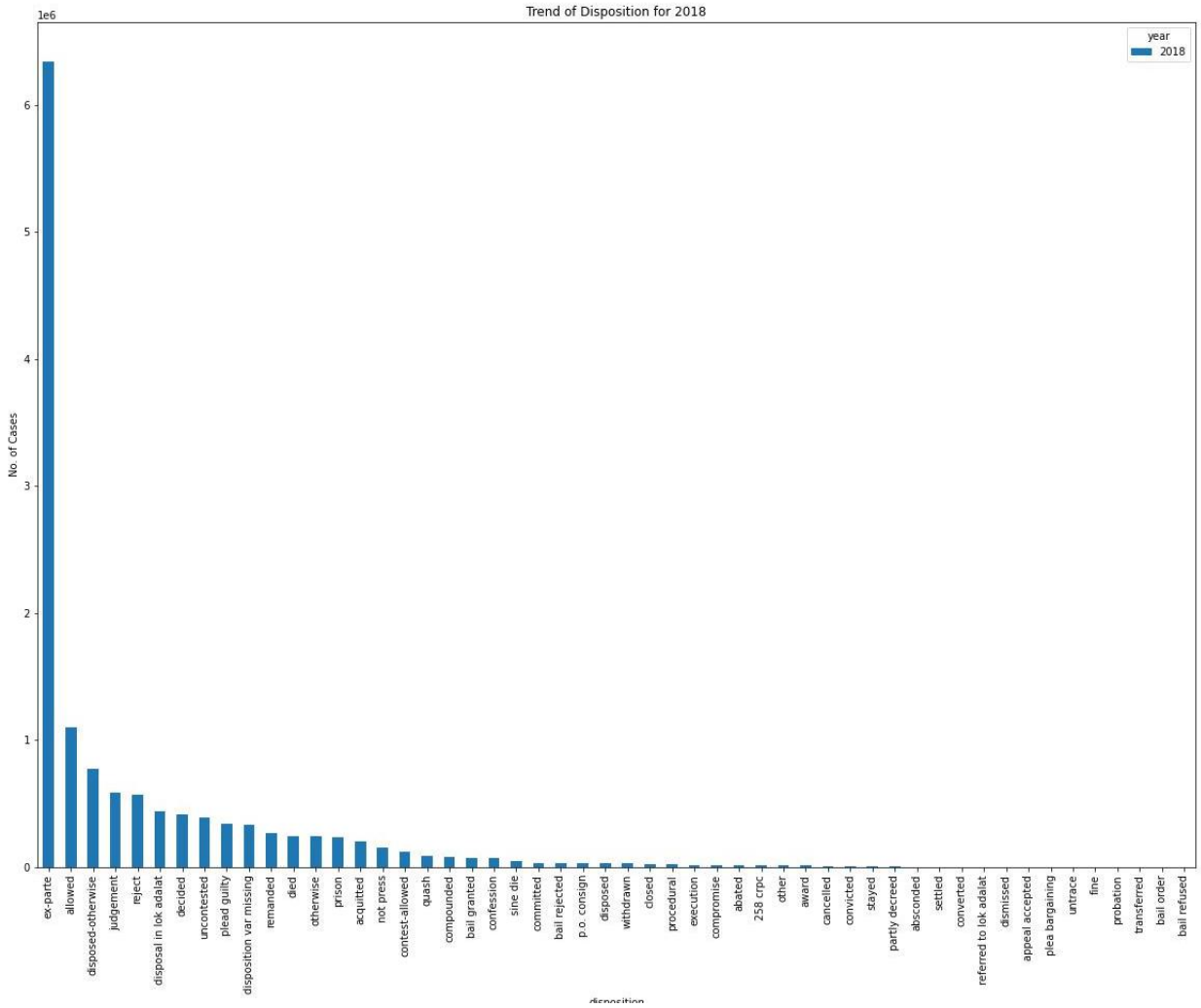


- In 2017 most cases were disposed as ‘ex-parte’.
- Next highest is ‘allowed’.
- The number of cases ‘acquitted’ have dropped again from 2016 to 2017.
- Comparing 2016 and 2017 data we observe that in 2017, the number of cases ‘rejected’ is more than the number of cases ‘disposal in Lok Adalat’.

8. *Trend of disposition of cases in 2018*

Top ten dispositions in the year 2018

year	2018
disp_name_s	
ex-parte	6338472
allowed	1104047
disposed-otherwise	778906
judgement	590995
reject	571902
disposal in lok adalat	441631
decided	416122
uncontested	394249
plead guilty	339551
disposition var missing	332869

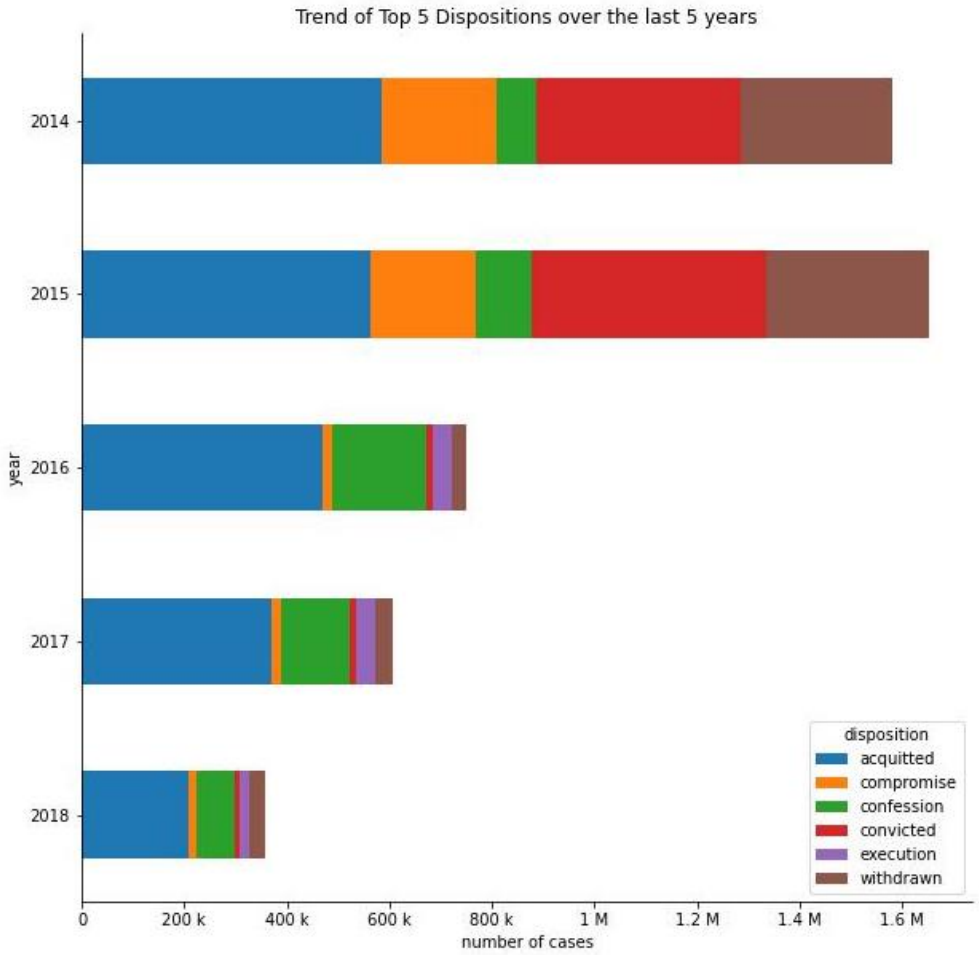


- In 2018 most cases were disposed as ‘ex-parte’.
- Next highest was ‘allowed’.
- A lot of cases were ‘rejected’ and ‘disposed in Lok Adalat’.
- The top ten dispositions in 2017 and 2018 are the same except that the number of cases disposed as ‘plead guilty’ have increased.

9. *Trend of number of cases for some dispositions over the last 5 years*

disp_name_s	acquitted	compromise	confession	convicted	execution	withdrawn
year						
2014	584050	224978	78039	397669	246	294791
2015	562171	205710	111226	455331	350	319350
2016	471271	16692	185068	13019	35926	28989
2017	371770	17994	133014	13753	36278	34043
2018	207801	15973	73679	10942	19242	29986

Stacked bar graph showing the number of cases for some dispositions.



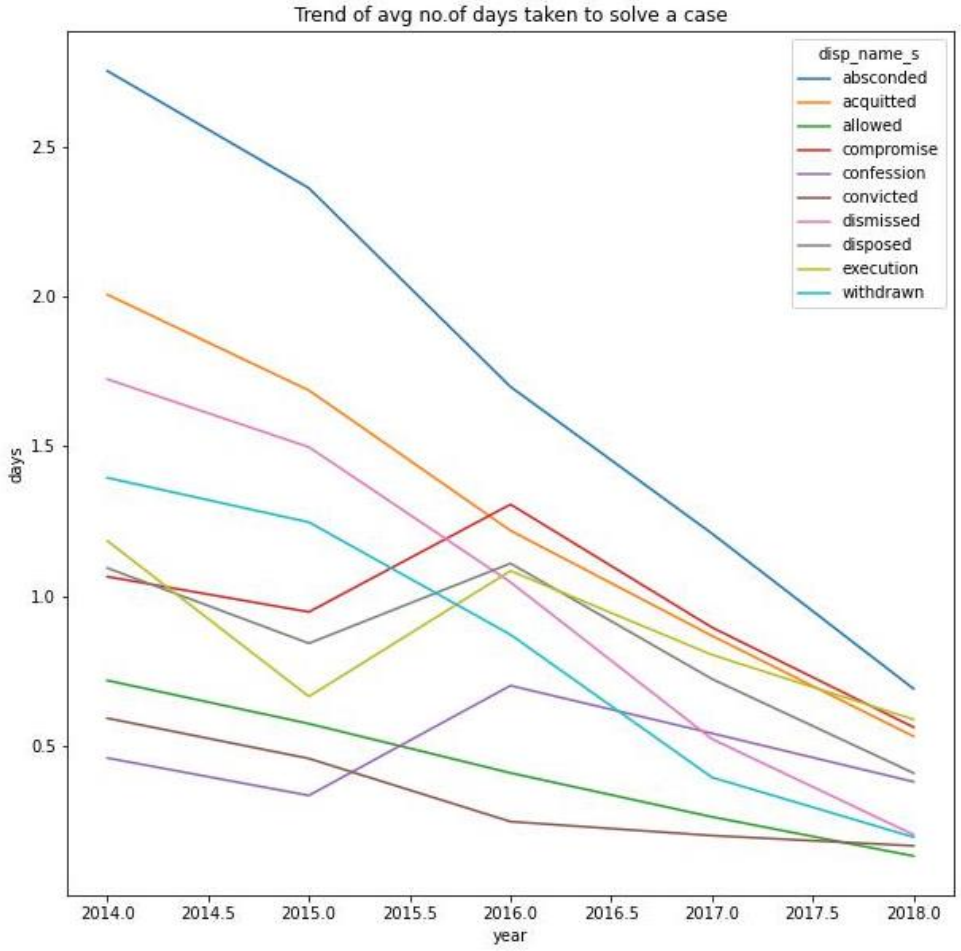
- The number of cases with disposition type 'acquitted' has dropped from 2014 to 2018. This means that the number of cases where someone who has been accused of a crime is innocent.
- The number of cases with a disposition 'convicted' and 'compromised' have dropped by huge numbers.
- The cases 'executed' have changed in numbers from 250 to 36000.

10. Average time taken to solve a case for a given type of disposition.

Computing the time taken to solve a case using the information regarding filing and decision date. The average time taken to solve a case with respect to some of the common dispositions is found for different years.

disp_name_s	absconded	acquitted	allowed	compromise	confession	convicted	dismissed	disposed	execution	withdrawn
year										
2014	2.752184	2.005862	0.718125	1.064504	0.459393	0.592060	1.723445	1.093185	1.183706	1.394516
2015	2.361004	1.686315	0.573797	0.946762	0.334207	0.457494	1.496818	0.841938	0.664470	1.246213
2016	1.698379	1.218400	0.409452	1.305692	0.700954	0.247146	1.046003	1.108752	1.083766	0.871088
2017	1.208342	0.867158	0.262796	0.895058	0.541726	0.200464	0.522623	0.723103	0.803722	0.394684
2018	0.690500	0.531365	0.132236	0.562279	0.380086	0.166316	0.203366	0.409117	0.588020	0.195239

Trend of average number of days taken to solve a case.



- From the plots we can say that the average time taken to solve a case has reduced from 2014 to 2018. This could tell us about the efficiency of courts in India. Reduced time to solve cases says that the district courts in India have become more efficient.
- With increase in number of cases and decrease in the average time taken to solve a case from 2014 to 2018 we can that the Indian Judicial system is becoming stronger.

Analysis 3:

1. *Number of male and female judges state wise*

   To get the data for male and female judges the two data frames 'judges_clean.csv' and 'cases_courts_key.csv' were merged. Grouping the data based on state name gives a count of female judges for each state.

	state_name	female_judge	count
0	Andhra Pradesh	-9998 unclear	15
1	Andhra Pradesh	0 nonfemale	2101
2	Andhra Pradesh	1 female	1136
3	Assam	-9998 unclear	24
4	Assam	0 nonfemale	610
...	...	...	...
78	Uttarakhand	0 nonfemale	419
79	Uttarakhand	1 female	302
80	West Bengal	-9998 unclear	17
81	West Bengal	0 nonfemale	1296
82	West Bengal	1 female	547

83 rows × 3 columns

2. *Number of male and female judges district wise*

	state_name	district_name	female_judge	count
0	Andhra Pradesh	Ananthapur	0 nonfemale	119
1	Andhra Pradesh	Ananthapur	1 female	59
2	Andhra Pradesh	Chittoor	0 nonfemale	150
3	Andhra Pradesh	Chittoor	1 female	52
4	Andhra Pradesh	East Godavari	-9998 unclear	3
...	...	...	...	...
1257	West Bengal	Purulia	1 female	8
1258	West Bengal	South Dinajpur	0 nonfemale	20
1259	West Bengal	South Dinajpur	1 female	14
1260	West Bengal	South Twenty Four Parganas	0 nonfemale	181
1261	West Bengal	South Twenty Four Parganas	1 female	60

1262 rows × 4 columns

3. *Number of male and female judges court wise*

	state_name	district_name	court_name	female_judge	count
0	Andhra Pradesh	Ananthapur	District Court Complex, Ananthapuramu.	0 nonfemale	81
1	Andhra Pradesh	Ananthapur	District Court Complex, Ananthapuramu.	1 female	34
2	Andhra Pradesh	Ananthapur	Family Court, Anantapuramu	0 nonfemale	17
3	Andhra Pradesh	Ananthapur	Family Court, Anantapuramu	1 female	18
4	Andhra Pradesh	Ananthapur	JUNIOR CIVIL JUDGE COURT,TADIPATRI	0 nonfemale	8
...	...	...	...	...	...
7117	West Bengal	South Twenty Four Parganas	Civil Judge Senior Division Establishment	1 female	6
7118	West Bengal	South Twenty Four Parganas	District and Sessions Judge Alipur	0 nonfemale	17
7119	West Bengal	South Twenty Four Parganas	District and Sessions Judge Alipur	1 female	2
7120	West Bengal	South Twenty Four Parganas	Sealdah Railway Magistrate Court	0 nonfemale	17
7121	West Bengal	South Twenty Four Parganas	Sealdah Railway Magistrate Court	1 female	3

7122 rows × 5 columns

4. *State wise percentage of working and retired, male and female judges.*

The derived data is classified based on male and female, retired, and working. The status of a judge is found by the end date. For judges with end date as a null value, the status has been taken to be working. Creating a pivot table using this data gives the statistics of number of active and inactive, male and female judges.

District wise:

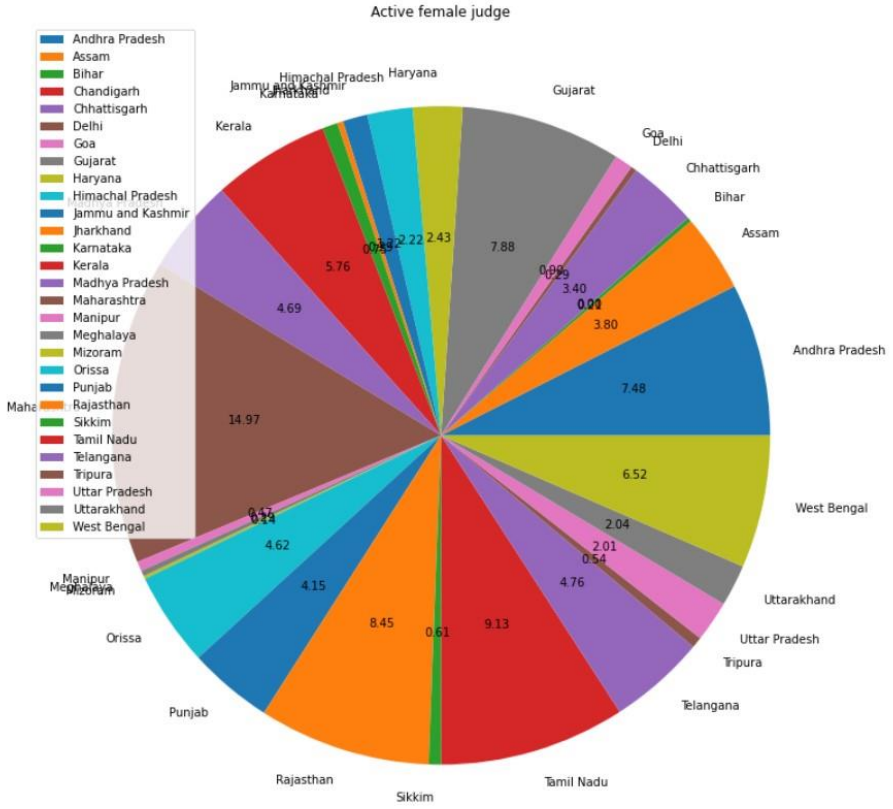
		percentage %			
	status	Active female judge	Active male judge	Inactive female judge	Inactive male judge
state_name	district_name				
Andhra Pradesh	Ananthapur	0.358038	0.339710	0.451779	0.356366
	Chittoor	0.322234	0.500626	0.396460	0.434767
	East Godavari	1.074114	0.661541	0.719159	0.766188
	Guntur	1.360544	0.679421	1.336898	0.655714
	Kadapa	0.358038	0.178795	0.322700	0.302912
...	...	...	...	...	...
West Bengal	Purba Bardhaman	0.214823	0.232433	0.184400	0.103346
	Purba Medinipur	0.608665	0.232433	0.202840	0.160365
	Purulia	0.071608	0.160915	0.055320	0.071273
	South Dinajpur	0.214823	0.071518	0.073760	0.057019
	South Twenty Four Parganas	0.716076	1.072770	0.368800	0.431203

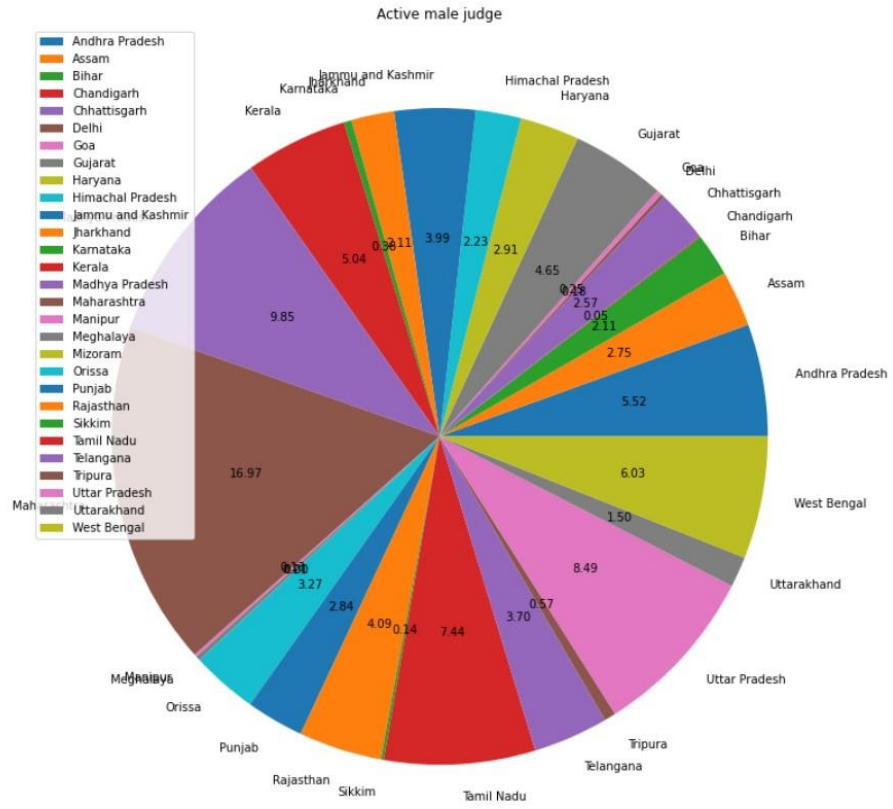
584 rows × 4 columns

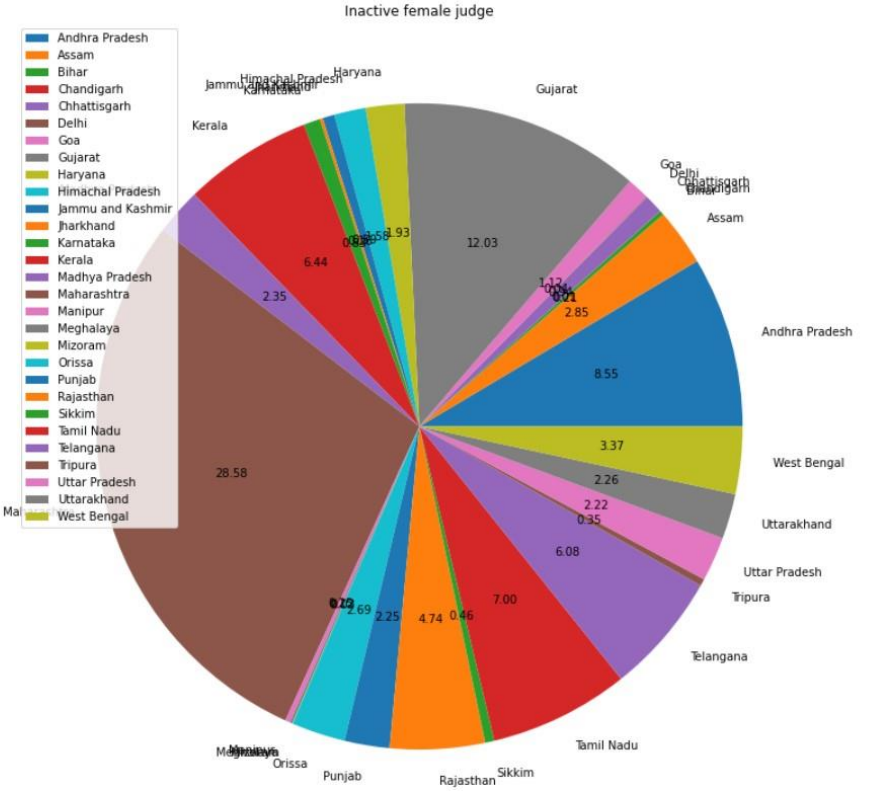
State wise

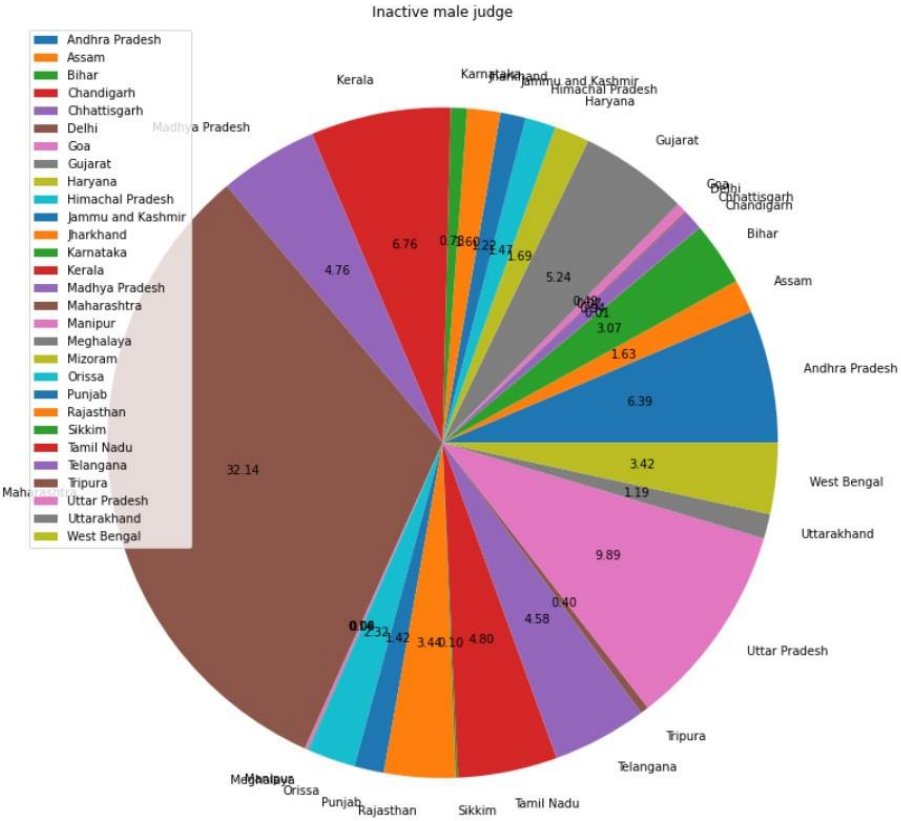
status	Active female judge	Active male judge	Inactive female judge	Inactive male judge
state_name				
Andhra Pradesh	7.482993	5.524763	8.546930	6.386087
Assam	3.795202	2.753442	2.848977	1.625031
Bihar	0.214823	2.109780	0.212060	3.071879
Chandigarh	NaN	0.053638	0.009220	0.014255
Chhattisgarh	3.401361	2.574647	0.940439	0.944371
Delhi	0.286430	0.178795	0.036880	0.074837
Goa	0.895095	0.250313	1.115619	0.488222
Gujarat	7.876835	4.648668	12.032086	5.242151
Haryana	2.434658	2.914357	1.926978	1.692741
Himachal Pradesh	2.219835	2.234937	1.576618	1.471794
Jammu and Kashmir	1.217329	3.987127	0.590079	1.218773
Jharkhand	0.286430	2.109780	0.156740	1.596522
Karnataka	0.751880	0.375469	0.829799	0.780443
Kerala	5.764411	5.042017	6.435552	6.760272
Madhya Pradesh	4.690297	9.851600	2.351097	4.757493
Maharashtra	14.965986	16.967638	28.581966	32.137130
Manipur	0.465449	0.125156	0.248940	0.135419
Meghalaya	0.286430	0.214554	0.119860	0.057019
Mizoram	0.143215	NaN	0.027660	NaN
Orissa	4.618690	3.271947	2.692237	2.316382
Punjab	4.153240	2.842839	2.249677	1.421902
Rajasthan	8.449696	4.094404	4.739074	3.438937
Sikkim	0.608665	0.143036	0.460999	0.096219
Tamil Nadu	9.129968	7.437869	6.997972	4.796693
Telangana	4.761905	3.701055	6.075973	4.575746
Tripura	0.537057	0.572144	0.350360	0.395567
Uttar Pradesh	2.005013	8.492759	2.222017	9.892734
Uttarakhand	2.040816	1.501877	2.258897	1.193828
West Bengal	6.516291	6.025389	3.365296	3.417555

Pie chart depicting state wise percentage of working and retired, male and female judges.






Inactive female judge
Andhra Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Orissa
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttar Pradesh
Uttarakhand
West Bengal
12.03
8.55
2.85
3.37
2.26
2.22
0.35
6.08
7.00
0.46
4.74
2.25
2.69
28.58
6.44
2.35
1.93
1.12


Inactive male judge
Andhra Pradesh
Assam
Bihar
Chandigarh
Chhattisgarh
Delhi
Goa
Gujarat
Haryana
Himachal Pradesh
Jammu and Kashmir
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Orissa
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttar Pradesh
Uttarakhand
West Bengal
6.39
3.07
1.63
5.24
3.42
1.19
9.89
0.40
4.58
4.80
0.10
3.44
1.42
2.32
32.14
4.76
6.76
1.69
1.47
1.22

- Maharashtra has the highest percentage of active female judges followed by Tamil Nadu and Rajasthan. Gujarat and Andhra Pradesh also have a high percentage of active female judges. Bihar, Delhi, Jharkhand, and Meghalaya have the least percentage of active female judges
- Maharashtra has the highest percentage of active male judges followed by Madhya Pradesh, Uttar Pradesh, and Tamil Nadu. Chandigarh, Manipur, Sikkim, Delhi, and Goa have the least percentage of active male judges.
- Maharashtra has the highest percentage of inactive female judges followed by Gujarat and Andhra Pradesh. Chandigarh, Mizoram, Delhi, Meghalaya, Jharkhand, and Manipur have very low percentages of Inactive female judges.
- Maharashtra has the highest percentage of inactive male judges followed by Uttar Pradesh and Andhra Pradesh. Chandigarh, Meghalaya, Delhi, Sikkim, Tripura, Goa, and Chhattisgarh have very low percentages of inactive male judges.
- From the above data and pie charts its very clear that Maharashtra was one of the states with the highest number of judges in the district court. A very high percentage of female judges shows that there is a lot of opportunity for the female in the state of Maharashtra. Although this percentage is relatively low when compared to the number of male judges.
- In states like Tamil Nadu, Rajasthan, West Bengal, Himachal Pradesh, Meghalaya, Madhya Pradesh, Sikkim the relative percentage of female judges is higher than the male judges.

5. *Average years of experience of judges*

District wise

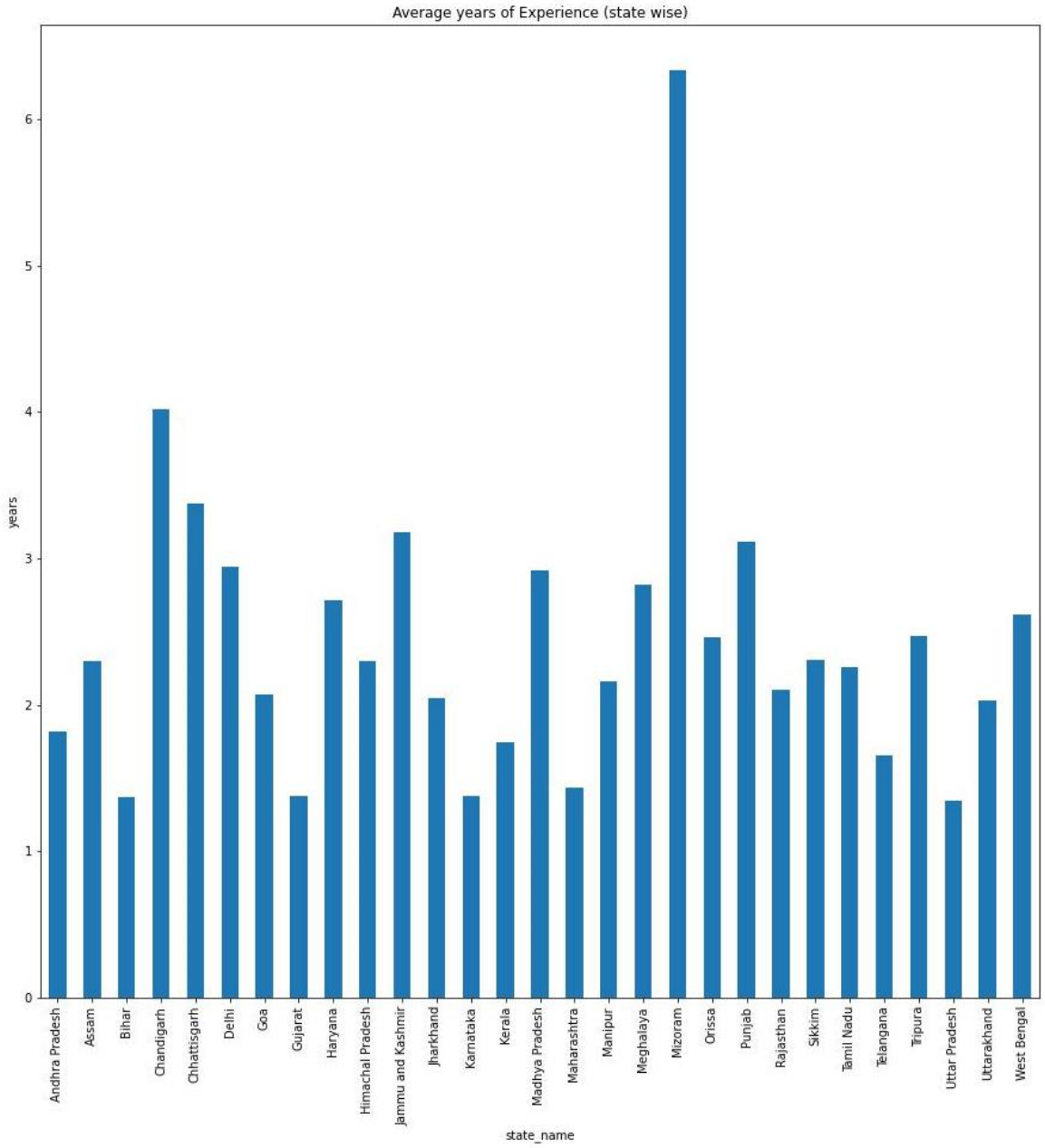
		mean
		years_of_experience
state_name	judge_position	
Andhra Pradesh	1-additional civil judge junior division	2.759589
	1-mm court	1.159452
	10-additional district and sessions court	1.299436
	11-additional district and sessions court	2.535029
	13-additional district and sessions court	1.819787
...	...	...
West Bengal	metropolitan magistrate court	5.715982
	municipal court	2.782648
	railway ner	4.486301
	small cause court	3.185056
	wac	1.646575

481 rows × 1 columns

State wise

	mean
	years_of_experience
state_name	
Andhra Pradesh	1.822144
Assam	2.300014
Bihar	1.366499
Chandigarh	4.022945
Chhattisgarh	3.375863
Delhi	2.942902
Goa	2.070736
Gujarat	1.381994
Haryana	2.714098
Himachal Pradesh	2.301669
Jammu and Kashmir	3.183293
Jharkhand	2.046899
Karnataka	1.375012
Kerala	1.741553
Madhya Pradesh	2.921751
Maharashtra	1.433723
Manipur	2.158848
Meghalaya	2.817780
Mizoram	6.332877
Orissa	2.464702
Punjab	3.115803
Rajasthan	2.103746
Sikkim	2.310281
Tamil Nadu	2.255940
Telangana	1.659116
Tripura	2.473277
Uttar Pradesh	1.345442
Uttarakhand	2.027798
West Bengal	2.617724

Bar graph showing the average years of experience of a judge for each state



- Judges in Mizoram have the most work experience.
- Chandigarh, Chhattisgarh, Jammu and Kashmir, and Punjab have judges with minimum 3 years of experience.