

Comparing and analysis the safety scale and crime scale in Bangladesh and India

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This Report Presented in Partial Fulfillment of the Requirements for
The Degree of Bachelor of Science in Computer Science and Engineering

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DHAKA, BANGLADESH

January 2021

APPROVAL

This Project/internship titled “Comparing and analysis the safety scale and crime scale in Bangladesh and India”, submitted by Md Sajedul islam, ID No: 173-15-10272 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 31-01-2021.

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ACKNOWLEDGEMENT

First of all we express our heartiest thanks and gratefulness to almighty Allah for his divine blessing make us possible to complete the final year project successfully in this pandemic situation. Then we would like to often our sincere gratitude to our supervisor Zarin Nasrin Tumpa lecturer, Department of CSE Daffodil International University for guiding me on how I should approach the problem.

And we also grateful to Google, YouTube and Kaggle discussion forum people who shared idea and problem solution.

DECLARATION

We hereby declare that this thesis has been done by us under the supervision of Zerin Nasrin Tumpa, Lecturer, Department of CSE Daffodil International University. We also declare that neither this thesis nor any part of this thesis has been submitted elsewhere for award of any degree or diploma.

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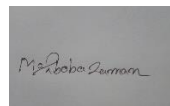


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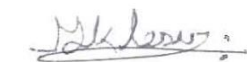
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Abstraction

Every citizen expectation improving life qualities and situational development and wants to ensure their lives with safely and securely. Traditionally research and analysis is support to government about reducing and alarming the crime. In this paper we try to figure out the crime density. There had been a huge increment in the crime in the ongoing past. Now crime is the common fact of affecting in our social quality of life and economy growth of society. Any research that can be help to reduce the crime in different ways. Here we use clustering algorithm to make crime pattern technique for help of detect crime area and it makes the process of solving crime.

We apply the process of approach to real crime from different police station and it is valid validate of result. The collecting data is unsupervised data. The unsupervised data net processing in two ways. In this paper, main role of crime zone. We likewise use semi-managed learning strategy here for information disclosure from the crime records and to help increment the prescient accuracy. We select the area and analyzing the crime rate that's make to reduce of crime analysis. K-Means clustering algorithm is make the crime data pattern and make the result. We moreover built up a weighting plan for ascribes here to bargain with impediments of different out of the case bunching instruments. This simple to execute AI system works with the geo-spatial plot of crime and assists with improving the profitability of the analysts.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

With the passage of time and advanced technology, the curve of crime is rising. Although technology has come to improve our quality of life, it has fallen in to the hands of some unscrupulous people and various criminal activities are being carried out by technology .crime is a headache for the government of every country .It breaks down the economic infrastructure of the society .Making life in society scary.

Crime has been on the rise since ancient times and now as the population grows, it seems to be getting worse globally a lot of research is being done on crime, how to control it .There has been a lot research in Bangladesh, it is still happening but the result are not remarkable. A small country is densely population, crime control is not so easy here. However, we are now in the age of the information and technology. So, with the help of technology and information, we try to find some solution to the problem of crime control.

Now the most interesting aspect of technology is artificial intelligence. One of its braches is machine learning that is provide system the capacity to automatically learn and improve from experience without being expressly programmed. It focuses on the improvement of computer programs that can access data and use it learn for themselves. Now it is use widely for example, medical diagnosis, image processing, prediction, classification, learning association, regression etc.

It has many algorithm, which are very powerful. Algorithms are used to tech machines how to operate and work based on information .With the help of machine learning in our paper we will analyze some of the previous crime data. And try to find out pattern of crime, zone of crime who is more involved in crime, when crime is occur more and who is being victimized.

1.2 Motivation

It is very tragic when it is heard that a 3-year-old child was raped by his neighbor out of greed for lipstick. It was shocked to hear that corpses had been dumped here and there in sacks, scattered in different parts of the body in different places. Apart from this theft, robbery are now a daily occurrence .Drug and arms smuggling is also on the rise. Terrorism is now a concern for the entire subcontinent, although Bangladesh's dominance is comparatively low.it so many crimes are not controlled in time or proper action is not taken, it will have a serious impact on the society in the future.

Our law enforcement forces prevent many criminal activities at great risk .if they had predicted the crime earlier, their risk would have been lower. They have many great successes .this paper is about how to make their work easier.

An analysis of a case with past case information will show who can commit the type of crime .and if the type of case matches then the solution of the case will be faster. Moreover, past crime information can be used to determine which areas are at risk for which crimes. In that case common people can also be careful. If it cabs be confirmed who is involved then they can be protected before they get involved in the crime and the pattern analysis of those who are suffering can also warn them.

1.3 Rational of the study:

I have focused on this topic by looking at the crime trend around me. I really concerned about how crime is on the rise in the society.

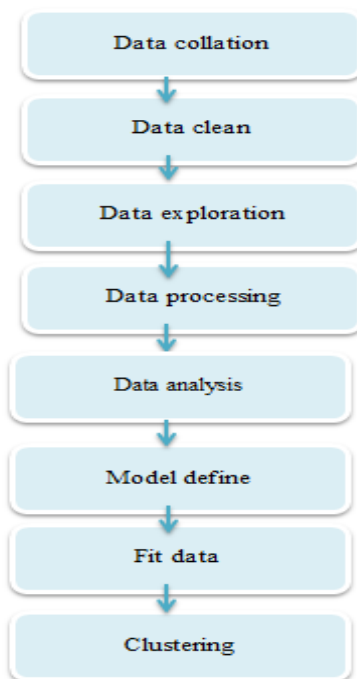
So I wanted to analyze the type of crime, the reason and the type of criminal and victim. That's why we have done this analysis with all the crime data registered in the IPC of India from 2001-2012.

1.4 Research Questions

Here are the main questions those are focuses in this thesis are given below:

1. What class of people are more involved in crime?
2. What environment are criminals coming from?
3. Which areas are more liable to crime?
4. What class of people are being victimized?
5. Which country is more risk?
6. What type of crime occurred more?
8. How to reduce it?

1.5 Research Methodology



1.6 Research Objectives

Crime is a very sensitive matter in the world. There are some objective to recharge:

- Crime hotspot detection
- Criminal status detect
- Victim status detect
- Compare crime previous decade and present decade
- Aware of crime hotspot
- Crime rate comparing

1.7 Research Goal

Analysis will reveal who is involved in the crime .the environment are they coming from .be able to identify risky areas .and those who may be victims of crime can be made aware. We will analyze the data of the previous decade and then compare the crime rate with the current decade.

1.9 Research Gap

Most of the crime research deal with a specific crime or specific area crime. But here is an analysis of all the violence and nonviolence crime in India .And the amount of any crime in each state is shown.

CHAPTER 2

2.1 Relate work

This segment presents the world's audit of reception of prescient policing approach, which is either basically actualized to defeat wrongdoing proportion in the general public and different techniques that can be helpful in embracing such framework.

In [1] M. Camacho-Collados et.al proposed the DSS as prescient policing open door for Spanish National Police Corps (SNPC). SNPC cooperation and the need of forestalling violations helps in deciding unequivocal issue space what's more, getting significant information. SNPC coordinated effort and the need of forestalling wrongdoings helps in deciding positive issue space also, getting applicable information. The numerical model is utilized to recognize the region district for better circulation and prescient methods uses for future anticipating. The prepared model is then tried in Central District of Madrid, where prescient outcomes significantly precisely estimate what's to come episodes and DSS sagaciously propose asset appropriation in the directed locale. Another investigation found that is executed for the Korean Police Agency, where crime percentage dramatically rising and life become hopeless particularly for ladies and youngsters. A. Nasridinov et.al [2] work was the first usage of prescient policing in South Korea, on genuine wrongdoing dataset assembled from various sources. He utilized different significant AI algorithms, for example, K-NN, SVM, Neural Network (NN), DT and others. Besides, creators examine the effect of unstructured and variation dataset on the prescient framework execution. Same algorithm on feasible dataset demonstrated the difference in model forecast likewise framework execution. Same algorithm on suitable dataset indicated the change in model expectation additionally framework execution. Other than this reality, on opposite, the proposed framework promisingly helps in lessening the wrongdoing in the said district and fundamentally anticipate exact criminal cases design.. Similarly, J. Agarwal, R. Nagpal and R. Sehgal in [3] have dissected crime and considered murder crime considering the comparing year and that the pattern is dropping from 1990 to 2011. They have utilized the k-means clustering method for extricating helpful data from the crime dataset utilizing RapidMiner apparatus since it is strong and complete bundle with adaptable help alternatives.

In [4] Priyanka Gera and Dr. Rajan Vohra have utilized a straight relapse for expectation the event of violations in Delhi (India). They survey a dataset of the most recent 59 years to anticipate event of certain violations including murder, thievery, burglary and so on. Their work will be useful for the nearby police stations in dynamic and Crime supervision.

It is proposed a model which predicted the crime hotspot by the source of human behavioral data that is mobile network activity [5]. Another example is a model that is biased random walk base on empirical knowledge of criminal offender's behavior. It search a patterns upon historical crime data [6].

Place-centric perspective is crime zoon detection and analysis then consequent [7] derivation of useful insights.it analysis patterns of criminal base on spatial and temporal found the existence multi scale complex relationship. Eck [8] and Chainey [9] proposed a model that knowledge discover from the criminal .recorded history of a geographical area likewise Mohler [10] built. The self-exciting point process model. But all of those have a

limitation because thus cannot generalize to previously unobserved .social media have also been as source of criminal activity indicators.

sadhana and sangaraeddy [11] have use twitter data and sentiment analysis to predicted crime they used create map the concentration of crime occurrence use this data.1990 us lemas and crime data 1995 FBI UCR and apply classification techniques like DT and NB with 83.95% accuracy to predict a crime category for different state of USA [12].the same dataset were also explored by somaych [13] who apply many machine learning algorithm .where KNN algorithm performed better than other algorithm with 89.50% accuracy.

CHAPTER 3

Machine learning

3.1 Introduction

We are using machine learning applications every day without knowing it. Machine learning is involved with every search result we do on Google. Search engines rank web pages using machine learning, the automatic photo tagging system on Facebook has been done using machine learning. Machine learning is an application of artificial intelligence. It accesses a dataset and learns from experience what it does. The initial goal was that the system would learn something on its own and be able to apply it without the help of any human .system learn to observe some data. Some examples are direct experience instruction in order to look for pattern in data and make better decision in the future based on the examples that we provide like a human, before taking a decision human brain search previous experience base on those experience human take a proper decision.

“A computer program is said to learn from experience E with respect to some class of task T performance at task in T, as measured by P improves with experience E”.

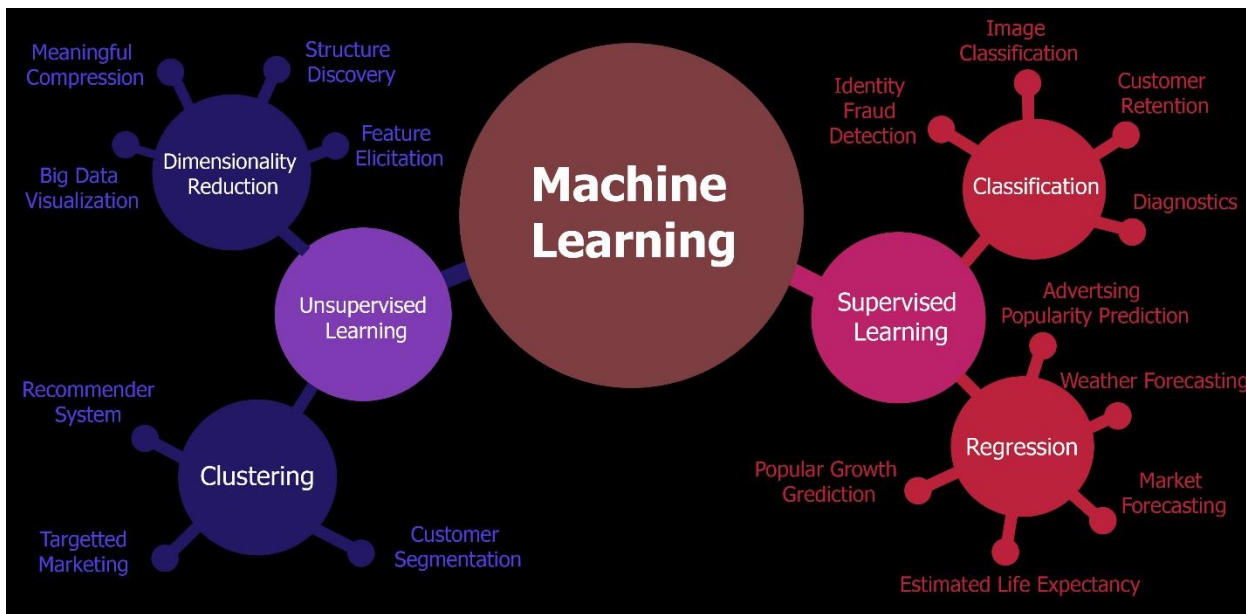


Figure 3.1.1 Machine Learning Classification

3.2 Supervised learning

We can apply supervised machine learning algorithm when asked to predict a future event based on some data from the past. Such data is called labeled data. In the beginning some data should be given to teach machine, data will be such that something has been evolved based on some attribute. Then the data will teach what kind of event will be if there is an attribute. Then if you give it some attributes, it will tell you from what he is learning what an event might be. It is not always possible to give correct result. It can also give wrong result for different reasons.

Regression and classification problem are the sub problem of supervised learning problem

In regression problems we try to predict the result as uninterrupted output on the other hand, when we proceed to classification we try to map variable in a teased category.

3.2.1 Regression

Suppose I have a price for a certain size house of housing company. We have to predict the price of a new house for an unknown size so it is a regression problem.

3.2.2 Classification

In tram of classification machine learning model will not predict any kind of price. All he has to do is offer a price that will tell him whether he will sell or not.

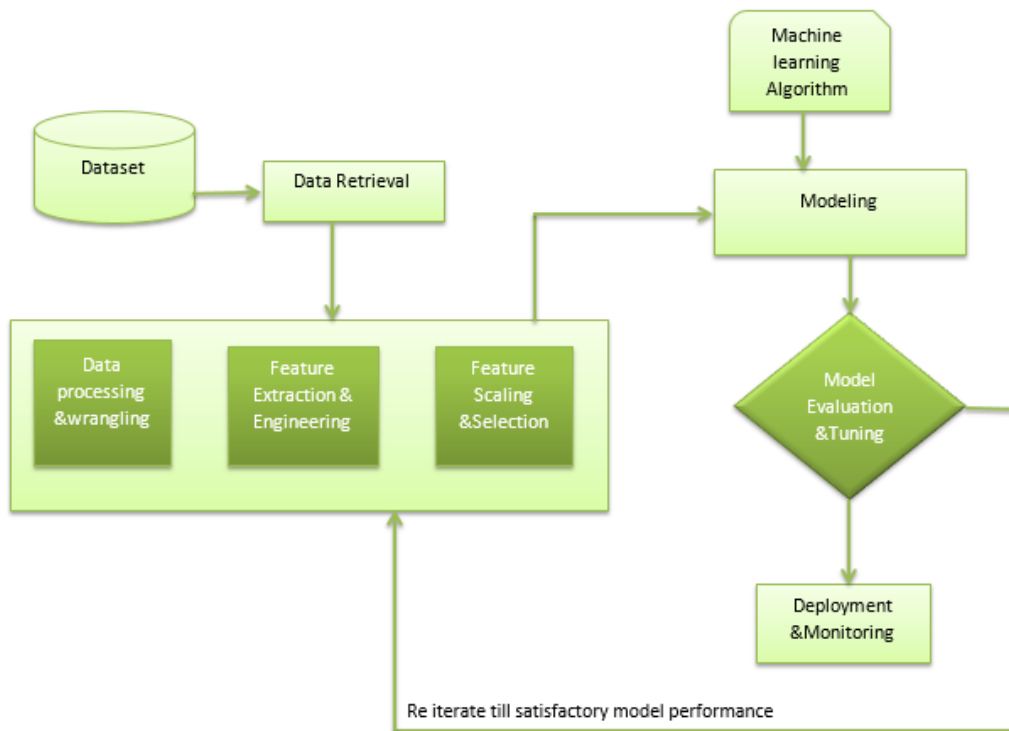


Fig : work flow of supervised learning

Figure 3.1.1 Supervised Learning

3.3 Unsupervised learning

Little is known or completely unknown what our output will be in the case of such problems. In this case we have to find a structure in the data that is hidden in our dataset .where the dataset has almost no idea what effect a variable has. We can find the structure of the data based on the interrelationship of the variables of dataset using unsupervised learning algorithm.

Suppose given a dataset of 1,000,000 different types of genes, we need to automatically group those genes. So that the genes of the same group are genes how related to each other.

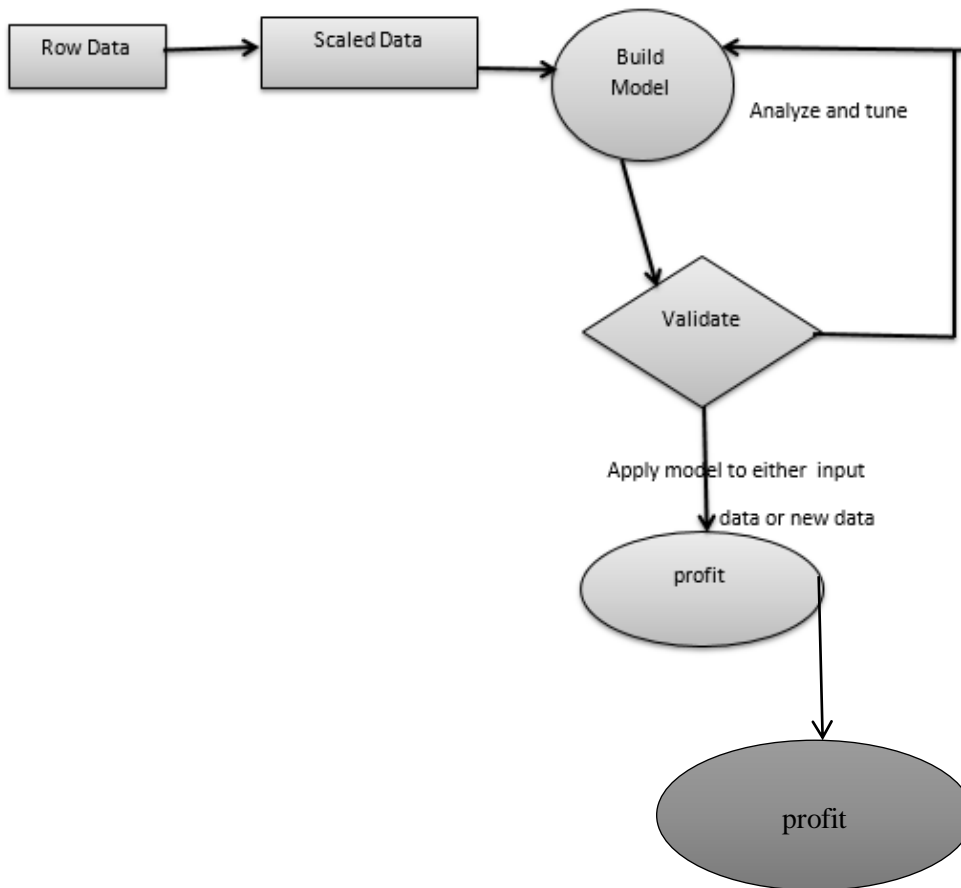


Figure 3.1.2 Unsupervised Learning

3.3.1 Clustering

In the unsupervised learning algorithm when apply on the unlabeled data then same types of data make number of groups. Such that data points in the same groups are more similar to other data points and dissimilar to the data points in other groups this process are call clustering.

3.3.2 Dimensionality reduction

Sometime model prediction result is not appropriate may have many reasons for it but the most common reasons is challenging to make model when lot of input features often modeling task.

Basically dimensionally reduce techniques use for the reducing the number of input variables in dataset. This techniques is less number of inputs in dataset.

There are two techniques used for the data visualization which is High dimensionality statistics and dimensionally reduction. Regression dataset or simplify a classification in order to better fit a predictive model can used that's technique in machine learning approaches.

CHAPTER 4

Clustering

4.1 Clustering Algorithm

Clustering is a technique to determine the different intrinsic clustering among the unlabeled datasets. There are no standards for a decent clustering. It relies upon the client, what is the rules they may utilize which fulfill their need. For example, we could be found to representatives for same categories groups of data set, in finding “Natural clusters” and explain their unfamiliar properties. This algorithm must make some description and assumptions which constitute the same categories of data points and make an equally of valid clusters.

4.1.1 Distribution based methods

Distribution based method is a clustering method which is use to fit the dataset on the probability that how it might have a place with a similar appropriation. The gathering done might be typical or Gaussian. Gaussian conveyance is more unmistakable where we have fixed number of circulations and all the up and coming information is fitted into it with the end goal that the dissemination of information may get boosted.

Clustering model works better for synthetic data and diversely sized clusters. Yet, this model may have issue if the limitations are not used to restrict model's complexity. Moreover, Distribution-based model is clustering produce clusters which expect compactly describe the numerical models underlying the data, a fairly solid presumption for some data appropriations.

4.1.2 Centroid based methods

This is essentially one of iterative clustering algorithm in which the clusters are framed by the closeness of data focuses to the centroid of clusters. Here, centroid of cluster center that is minimum distance of data points. This issue is essentially one of NP-Hard issue and consequently arrangements are ordinarily approximated over various preliminaries. This algorithm with the biggest problem that we have to determine K ahead of time. It also has density based distributions problem.

4.1.2.1 K means Clustering

K-means is a data processing system of entire data set into groups based on the pattern on data set that's find out the point where the data sets of group centroid. Centroid is the point where the center of data points. For unsupervised learning algorithm, most of the time we will use the K-means algorithm to get achievement. Here k is the centroid of a group of similar data items. To calculate that similarity, we will utilize the Euclidean distance as estimation.

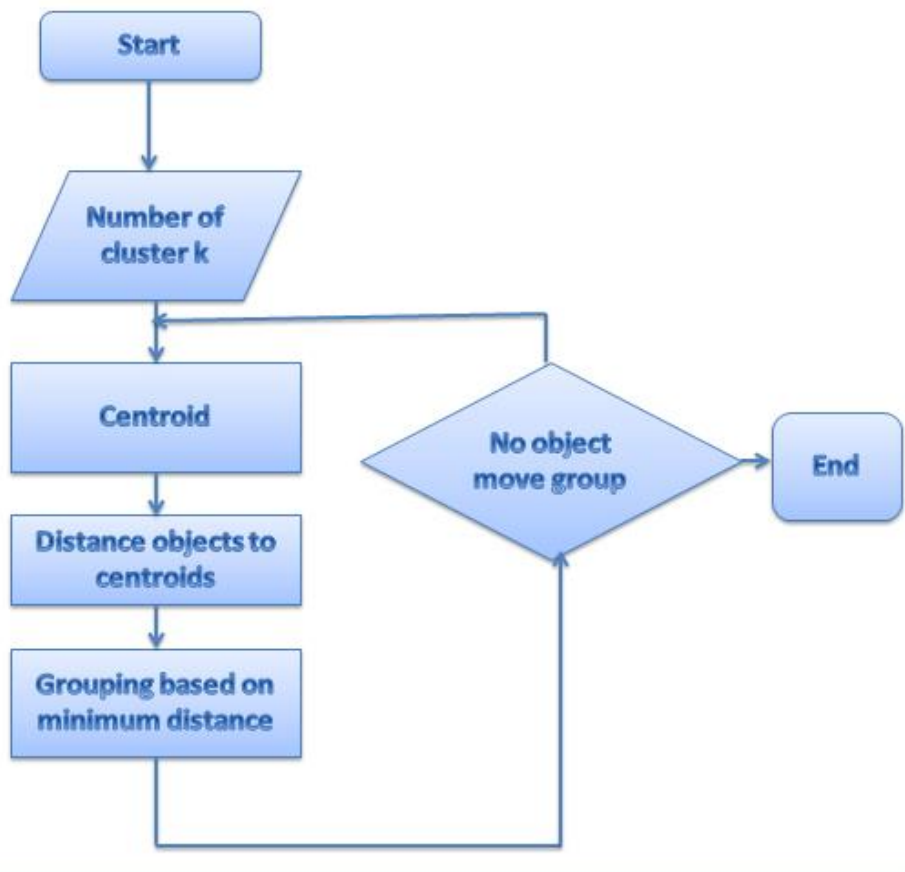


Figure 4.1.2.1 K means Clustering

4.1.2.2 Mini Batch K-means

Mini Batch K-means implies calculation's principle thought is to utilize little irregular clusters of information of a fixed size, so they can be put away in memory. Every emphasis another irregular example from the dataset is acquired and used to update the clusters and this is rehased until intermingling. Every mini than usual bunch updates the clusters utilizing a curved mix of the estimations of the models and the information, applying a learning rate that diminishes with the quantity of emphases. This learning rate is the reverse of the quantity of information relegated to a bunch during the cycle. As the quantity of cycles expands, the impact of new information is decreased, so combination can be recognized when no adjustments in the clusters happen in a few sequential emphases.

The observational outcomes recommend that it can acquire a generous sparing of computational time to the detriment of some loss of bunch quality, yet not broad investigation of the calculation has been done to gauge how the attributes of the datasets, for example, the quantity of groups or its size, influence the segment quality.

4.1.2.3 Mean shift

Mean shift is falling under the class of a clustering calculation interestingly of Unsupervised learning that does out the information focuses to the bunches iteratively by moving focuses towards the (mode is the most noteworthy thickness of information focuses in the locale, with regards to the Mean shift). Thusly, it is otherwise called the mode seeking calculation. Mean-move calculation has applications in the field of picture handling and PC vision

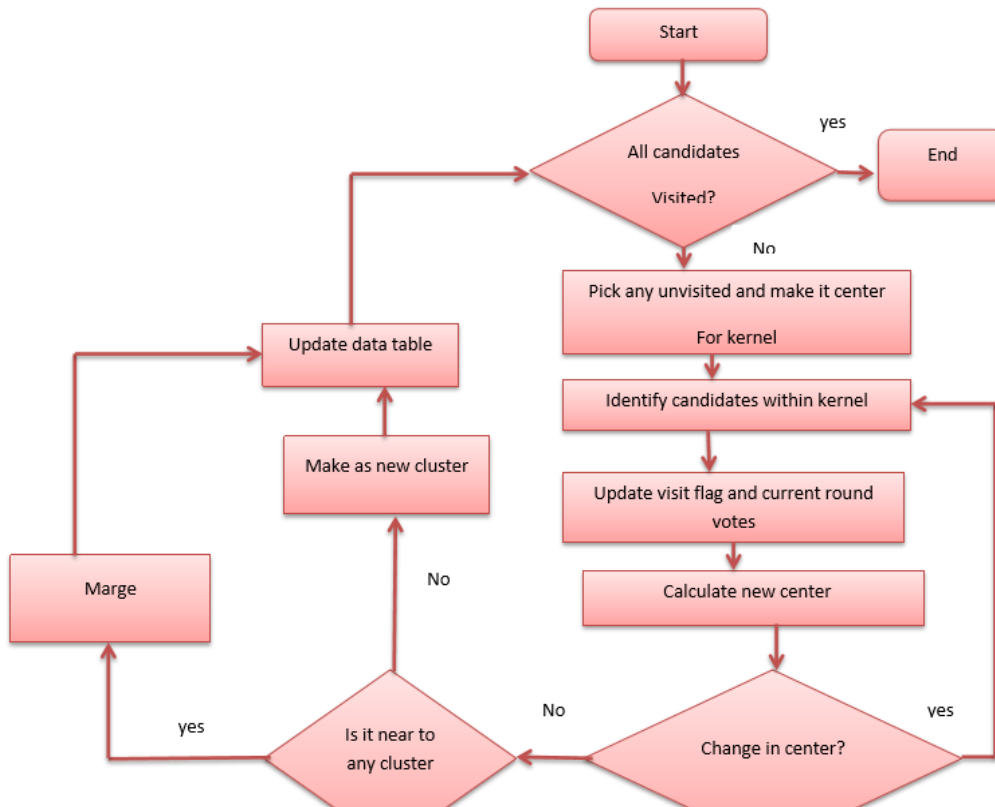


Figure 4.1.2.3 Mean shift Clustering

4.1.2.4 Fuzzy c-means

This algorithm works by allocating participation to every information point comparing to each cluster community based on distance between the clustered place and the data point. Gives best outcome for covered informational collection and similarly better than k-means algorithm. In fuzzy c-means, we discover the centroid of the data focuses and afterward compute the distance of every data point from the given centroids until the clusters shaped gets consistent.

4.1.3 Connectivity based methods

The center thought of network based model is like Centroid based model which is fundamentally characterizing clusters based on closeness of data points. Here we take a shot at an idea that the data points which are nearer have comparative conduct when contrasted with data points that are farther. It provides a comprehensive hierarchy of clusters that certain distance of each merge clusters. That is distance subjective function. This model is very easy to interpret and it's more lack of scalability.

4.1.1.1 Density Models

It is a clustering model to searching of data space for find out density of data points of varied area in the data space. From different densities present in the space depend on various density regions.

4.1.1.2 Density-Based Methods

These techniques consider the clusters as the thick district having some closeness and unique in relation to the lower thick region of the space. This method can merge two clusters and this methods have very good accuracy.

Density-Based Spatial Clustering of Application with Noise (DBSCAN), Ordering points to Identify Clustering Structure (OPTICS) etc.

4.1.1.2.1 DBSCAN

Generally, all clustering techniques utilize a similar methodology for example first we compute similarities and afterward we use it to bunch the information focuses into gatherings or groups. Here we will zero in on Density-based spatial clustering of utilizations with commotion (DBSCAN) clustering strategy.

Clusters are thick districts in the information space, isolated by areas of the lower thickness of focuses. The DBSCAN algorithm depends on this instinctive thought of "clusters" and "noise". The key thought is that for each purpose of a cluster, the neighborhood of a given sweep needs to contain in any event a base number of points.

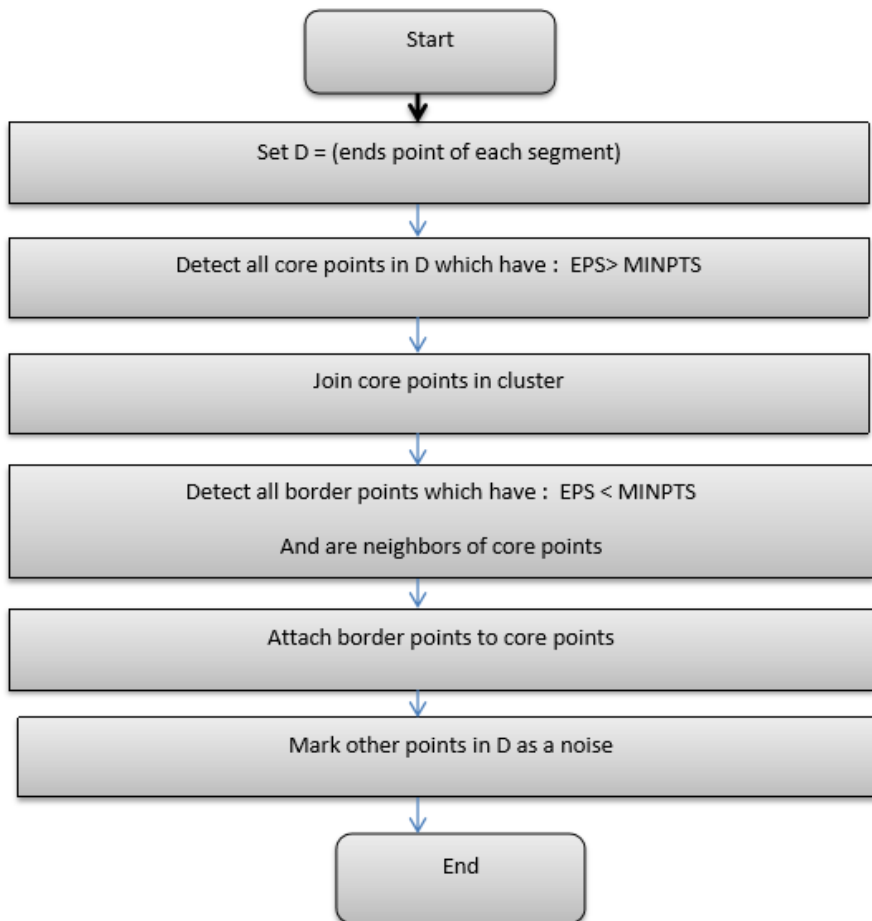


Figure 4.1.1.2.1 DBSCAN clustering

4.1.1.2.2 OPTICS Clustering

Ordering Points To Identify Cluster Structure short form OPTICS Clustering. It draws motivation from the DBSCAN clustering algorithm.

4.1.1.3 Hierarchical Based Methods clustering

A tree type structure based on the hierarchy its formed clustering method. The method formed new cluster by using previous formed cluster.

In data mining and insights, hierarchical clustering examination is a technique for cluster investigation which looks to fabricate a chain of importance of clusters for example tree type structure dependent on the progressive system.

4.1.1.3.1 Agglomerative Clustering

also called base up methodology or hierarchical agglomerative Clustering (HAC). A structure that is more instructive than the unstructured arrangement of clusters returned by level clustering. This clustering algorithms doesn't expect us to prespecify the quantity of clusters. Base up approach treat every information as a singleton cluster at the beginning and afterward progressively agglomerates sets of clusters until the sum total of what clusters have been converged into a solitary cluster that contains all information.

4.1.1.3.2 Divisive clustering

It is also called top-down methodology. This approach likewise doesn't need to prespecify the quantity of clusters. Top-down clustering requires a technique for parting a cluster that contains the entire data and continues by parting clusters recursively until singular data have been splotted into singleton cluster.

4.1.4 Partitioning Methods

This strategy divide the object by k cluster partition and one cluster take one partition. Every partition has formed into one cluster. This technique is utilized to advance a target model likeness capacity, for example, when the separation is a significant boundary.

4.1.5 Grid-based Methods

A grid-based clustering strategy adopts a space-driven strategy by partitioning the inserting space into cells free of the dispersion of the input objects. The main thing of this method very fast processing time and that's independent of the numbers of data objects.

4.1.6 Spectral Clustering

Spectral Clustering is a developing clustering algorithm which has performed in a way that is better than numerous customary clustering algorithm by and large. It treats every information point as a diagram hub and hence changes the clustering issue into a chart parceling issue.

4.1.7 Normal or Gaussian Distribution

All things considered, numerous datasets can be displayed by Gaussian Distribution that is (Univariate or Multivariate). So it is very normal and instinctive to accept that the clusters come from various Gaussian Distributions. Or then again all in all, it is attempted to display the dataset as a combination of a few Gaussian Distributions. This is the center thought of this model.

4.1.8 Guassian Mixture Model

Assume there are K clusters (For the purpose of effortlessness here it is accepted that the quantity of clusters are known and it is K). So and is additionally assessed for every k. Had it been just a single appropriation, they would have been assessed by most extreme probability strategy. In any case, since there are K such groups and the likelihood thickness is characterized as a straight capacity of densities of all these K disseminations.

CHAPTER 5

State and crime information

5.1 States Information

Security is basic human right no one in society can live without security. It is important ensure a safe environment where everyone can live comfortable not just anyone's safety. We need to think about the environment of a city where people can freely take advantage of all their activities such as housing, education, shopping and entertainment. We know that the insecurity and crime of a city is directly related to the city area and utilization of the city such as the population and size of the city, the immorality, the education system, these affect the crimes and the criminals in one way or more.

About Indian state and union territory

Rank	STATE OR UNION TERRITORY	ZONE	POPULATION (%)	AREA	LITERACY (%)	MUSLIM (%)	HINDU (%)	CHRISTIAN (%)	2011-2012 Nominal GSDP (₹ corer)
1	Uttar Pradesh	Central	16.50	240,928 km ²	67.68	19.26	79.73	0.18	7,24,050
2	Maharashtra	Western	9.28	307,713 km ²	82.34	11.54	79.83	0.96	12,80,369
3	Bihar	Eastern	8.60	94,163 km ²	61.80	16.87	82.69	0.12	2,47,144
4	West Bengal	Eastern	7.54	88,752 km ²	76.26	27.01	70.54	0.72	5,20,485
5	Madhya Pradesh	Central	6.00	308,245 km ²	69.32	6.57	90.89	0.29	3,15,562
6	Tamil Nadu	Southern	5.96	130,051 km ²	80.09	5.86	6.12	87.58	7,51,486
7	Rajasthan	Northern	5.66	342,239 km ²	66.11	9.07	88.49	0.14	4,34,837
8	Karnataka	Southern	5.05%	191,791 km ²	75.36	12.92	84.00	1.87	6,06,048
9	Gujarat	Western	4.99%	196,024 km ²	78.03	9.67	88.57	0.52	6,15,606
10	Andhra Pradesh	Southern	6.99	162,968 km ²	67.02	9.56	88.46	1.34	3,79,402
11	Odisha	Eastern	3.47%	155,707 km ²	72.87	2.17	93.63	2.77	2,30,987
12	Telangana	Southern	2.89%	112,077 km ²	80.09				3,59,434
13	Kerala	Southern	2.76%	38,863 km ²	94.00	26.56	18.38	54.73	3,64,048
14	Jharkhand	Eastern	2.73%	79,714 km ²	66.41	14.53	67.83	4.30	1,50,918
15	Assam	North-Eastern	2.58%	78,438 km ²	72.19	34.22	61.47	3.74	1,43,175
16	Punjab	Northern	2.29%	50,362 km ²	75.84	1.93	38.49	1.26	2,66,628
17	Chhattisgarh	Central	2.11%	135,191 km ²	70.28	2.02	93.25	1.92	1,58,074
18	Haryana	Northern	2.09%	44,212 km ²	75.55	7.03	87.46	0.20	2,97,539

NCT UT1	Delhi	Northern	1.39%	1,484 km ²	86.21	12.86	81.68	0.87	3,43,798
UT2	Jammu & Kashmir	Northern	1.01%	42,241 km ²	67.16	68.31	28.44	0.28	78,256
19	Uttarakhand	Central	0.83%	53,483 km ²	78.82	13.95	82.97	0.37	1,15,328
20	'Himachal Pradesh'	Northern	0.57%	55,673 km ²	82.80	2.18	95.17	0.18	72,720
21	Tripura	North-Eastern	0.3%	10,486 km ²	87.77	8.60	83.40	4.35	19,208
22	Meghalaya	North-Eastern	0.25%	22,429 km ²	74.43	4.40	11.53	74.59	19,918
23	Manipur	North-Eastern	0.21%	22,327 km ²	76.94	8.40	41.39	41.29	12,915
24	Nagaland	North-Eastern	0.16%	16,579 km ²	79.55	2.47	8.75	87.93	12,177
25	Goa	Western	0.12%	3,702 km ²	88.70	8.33	66.08	25.10	42,367
26	Arunachal Pradesh	North-Eastern	0.11%	83,743 km ²	65.38	1.95	29.04	30.26	11,063
UT3	Puducherry	Southern	0.1%	479 km ²	85.85	6.05	87.30	6.29	16,818
27	Mizoram	North-Eastern	0.09%	21,081 km ²	91.33	1.35	2.75	87.16	7,259
UT4	Chandigarh	Northern	0.09%	114 km ²	86.05	4.87	80.78	0.83	18,768
28	Sikkim	North-Eastern	0.05%	7,096 km ²	81.42	1.62	57.76	9.91	11,165
UT5	'Dadra & Nagar Haveli', 'Daman & Diu'	Western	0.05%	603 km ²	76.24	3.76	93.93	1.49	
UT6	'Andaman & Nicobar Islands'	Southern	0.03%	8,249 km ²	86.63	8.52	69.45	21.28	3,978
UT7	Ladakh	Northern	0.02%	96,701 km ²	90.29	15.14	35.37	0.88	
UT8	Lakshadweep	Southern	0.01%	32 km ²	91.85	96.58	2.77	0.49	

Table 5.1 States Information

[State: a state is a constituent division that has a separate government. states have their own elected government that are vested with the powers to frame the laws.

Union territory: A union territory is a small administrative unit that is ruled by the union .the union territories are administered and controlled directly by the central government of India]

5.2 Crime information

In India as of 2019 , a total of 51,56,172 cognizable crimes of which 32,25,701 IPC (Indian penal code) crimes and 19,30471 SSL (special & local laws) crimes were registered nationwide .the registration of case increased from 383.5 in 2018 to 385.5 in 2019 per 100,000 population . all the registered crime were classified as offences affecting the human body and goods which include violent acts such as murder kidnapping assault and death by negligence .

Category of crimes

Crime	Description	punishment
Murder	<p>Murder besides in the cases here in after excepted blamable crime is murder, if the demonstration by which the demise is caused finished with the goal of causing death by causing death of individual other than individual whose demise was planned if an individual, by doing anything which he means or knows to probably cause demise, perpetrates guilty.</p> <p>Homicide by causing the demise of any individual whose passing he neither means nor knows himself to probably cause the at fault .crime carried out by the wrongdoer is of the depiction of which it would have been in the event that he had caused the passing of the individual whose</p>	<p>Whoever commits murder will be rebuffed with death and will likewise be subject to fine discipline for homicide by life convict. Whoever being under sentence of (imprisonment to life) commits murder shall be punished with death.</p>

	demise he expected or realized that himself will generally probably cause	
Attempt to Murder	Does any demonstration with such aim or information and under such conditions that in the event that he by that, demonstration caused death he would be blameworthy of murder.	Be rebuffed with detainment of one or the other portrayal for a term which may reach out to ten years and will likewise be subject to fine.
Kidnapping	Kidnapping is the unlawful taking away or conveying of a person and wrongfully confining the person against this or her will kidnapping literally means child stealing however the offence has not been only confined to child stealing and abduction is considered to be. When a person has been taken away from his or her original location by persuading him or her, by some act of fraud or with a forceful way that may include violence.	Whoever abducts any individual from India or from lawful guardianship will be rebuffed with detainment of one or the other portrayal for a term which may reach out to seven years and will likewise be obligated to fine.
Dacoit	At the point when at least five people conjointly submit or endeavor to commit a theft or where the entire number of person conjointly submitting or attempting to commit burglary and people present and helping such commission or endeavor to at least five each individual so committing attempting.	Who commits dacoit will be rebuffed with detainment forever or with thorough detainment for a term which can be reach out to ten years and will also be obligated to pay the fine.

Robbery	Robbery means the theft of property from a person overcoming resistance by force or threat of force .where possible the category robbery should include muggings (bag –snatching) and theft with violence but should exclude pick pocketing and extortion .	A person who robs or assaults a person with intent to rob them or steal from the person of another is guilty of an offence this offence punishable by a maximum penalty of imprisonment for 14 years .
Burglary	Burglary means gaining unauthorized access to a part of a building /dwelling or their premises including by use of force with the intent to steal goods burglary should include where possible theft from a house. Apartment or other dwelling place factory shop or office from a military establishment or by using false key.it should exclude theft from a car from a container from a vending machine from a parking meter and from fenced.	Any individual who submits robbery will be rebuffed with thorough detainment which might be reach out as long as ten years and will likewise be subject to pay a fine
Theft	Theft is committed by any person who with intent to gain but without violence again or intimidation of persons nor force upon things shall take personal property of another without the laffer’s cosent .	Commits theft shall be punished with imprisonment of either description for a term which may extend to three years or with fine or both.
Riots	Religious violence in India incorporates demonstrations of viciousness by devotees of one strict gathering against supporters	Be punished with imprisonment of either description for a term which

	and foundation of another strict gathering frequently through revolting. Religious violence in India has commonly elaborate Hindus and Muslims may histories argue that Religious violence in autonomous India is a tradition of the British approach of gap and rule during the pioneer period in which directors pitted Hindus and Muslims again each other a strategy that in the long run finished in the segment of India.	may extend to two years or with fine or with both.
Criminal Breach of trust	A being execute to the will of a deceased person dishonestly disobeys the law which directs him to divide the effects according to the will and appropriate them to this own use a has committed criminal breach of trust.	The punishment for this offence is imprisonment up to 3 years or fine or both .it they criminally breach that Trust their punishment also includes imprisonment up to 7 year with fine.
Cheating	Fraudulently or dishonestly deceives a person in order to induce that person to deliver a retain any property .if a person to do or omit to do any act which he would not have done if he was not deceived to do so and the act has caused harm to that person in body mind reputation or property then the person who fraudulently dishonestly or intentionally induce the other person is said to cheat any dishonest concealment of fact	In the Indian corrective code manages cheating and insincerely instigating conveyance of property .the most extreme discipline which can be granted is detainment for a term of long term and fine.

	which can deceive a person to do an act which he would not have done otherwise is also cheating within the meaning of this section .	
Counteracting	India has no enactment managing forging and theft, however the officials through different resolutions have given legal common lawbreaker and managerial cures .it additionally alluded to as the demonstration of replicating brand has even more multiplied with mechanical development mints.	The discipline fluctuates from a half year to 3 years of detainment and fine going from INR 50,000-200,000 the rules recognize fake as cognizable wrongdoing ,where in the police can make a move and do look and seizure court warrant
Arson	Mischief by fire or any explosive substance intending to cause or knowing it to be likely that the will .there by cause the destruction of any building which is ordinarily used as place of worship or as a human dwelling or as a place for the custody of property	(Imprisonment for life) or with detainment of one or the other portrayal for a term which may stretch out to ten years and will likewise be at risk to fine.
Hurt \ grievous hurt	Simple hurt as causing bodily pain disease or infirmity .but voluntarily causing hurt by dangerous weapons.	Be punished with imprisonment of either description for a term which may extend to one year or with fine which may extend to one thousand Rupees or with both.
Dowry deaths	Dowry deaths are deaths of married woman who are murdered or driven To suicide by continuous harassment and torture by their	Which made dowry death a specific offence punished with a minimum sentence of imprisonment for 7 years and a maximum imprisonment.

	husband and in lows over a dispute about their dowry making the woman's homes the most dangerous place for them to be.	
Assault on woman with intent to outrage her modesty	Assault or uses criminal force to any woman intending to outrage or knowing it to be likely that he will there by outrage.	Be punished with imprisonment of either description for a term which small not be less than one year but which may extend to five years and shall also be liable to fine .
Insult to modesty of women	Intending to insult the modesty of any woman utters any words makes any sound or gesture or exhibits any object intending that such word or sound shall be heard or that such gesture or object shall be seen by such woman.	Be punished with simple imprisonment for a term which may extend to three year and also with fine.
Cruelty by husband or his relative	Husband or relative of husband of woman subjecting her to cruelty .the husband or the relative of the husband of a woman subjects such woman to cruelty.	Be punished with imprisonment for a term which may extend to three years and shall be liable to fine.
Other IPC crimes	Petty crime like pickpocketing, theft, Off valuable from luggage on train and buses have been reported in Indian penal code crimes (IPC)	
Total IPC crimes	All reported crime in Indian penal code.	

Table 5.2 Crime Information

CHAPTER 6

Analysis

6.1 India crime

Here is an analysis of all the crime data registered in the IPC of India from 2001-2014 and shows the extent of crime in state by state .analysis has shown how many cases are being failed, how many people are being arrested ,how many people are getting bail before trail and how many people are getting trial till the end .and it also shows what kind of relationship the perpetrator is coming up with more .

6.1.1 Murder by State/UT:

The highest murder occurred in Uttar Pradesh .it's location center of the country .highest population are live there and most people are Hindu religious. And lowest murder area is LAKSHADWEEP where 0.01% population live and 96.58% Muslim religious. Its location Southern zone.

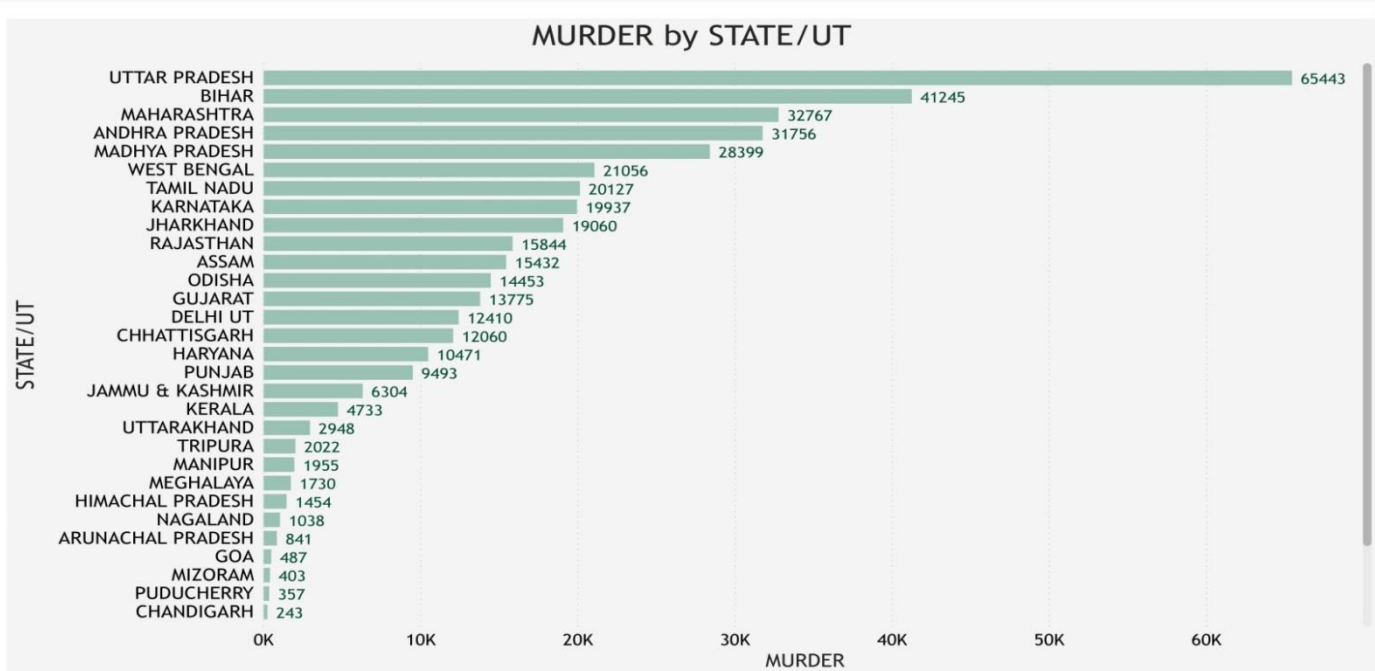


Figure-6.1.1 Murder by State/UT

6.1.1.1 Age wise murder

Uttar Pradesh occurred highest murder ,where maximum victim age range 18-30 years who's are young guys .then up to 30-50 years age victims second highest .above 50 years age victim in 3rd place . In Uttar

Pradesh child murder rate competitively low .on the other hand highest child murder occurred in Maharashtra .showing here west Bengal Uttarakhand Tripura Manipur and other small state here had not any child murder. West Bengal had 3 range victims 1st up to 18-30 2nd 30-50 and above 50 years age .over all young guys murder rate was highest for every state and 2nd highest 30-50.

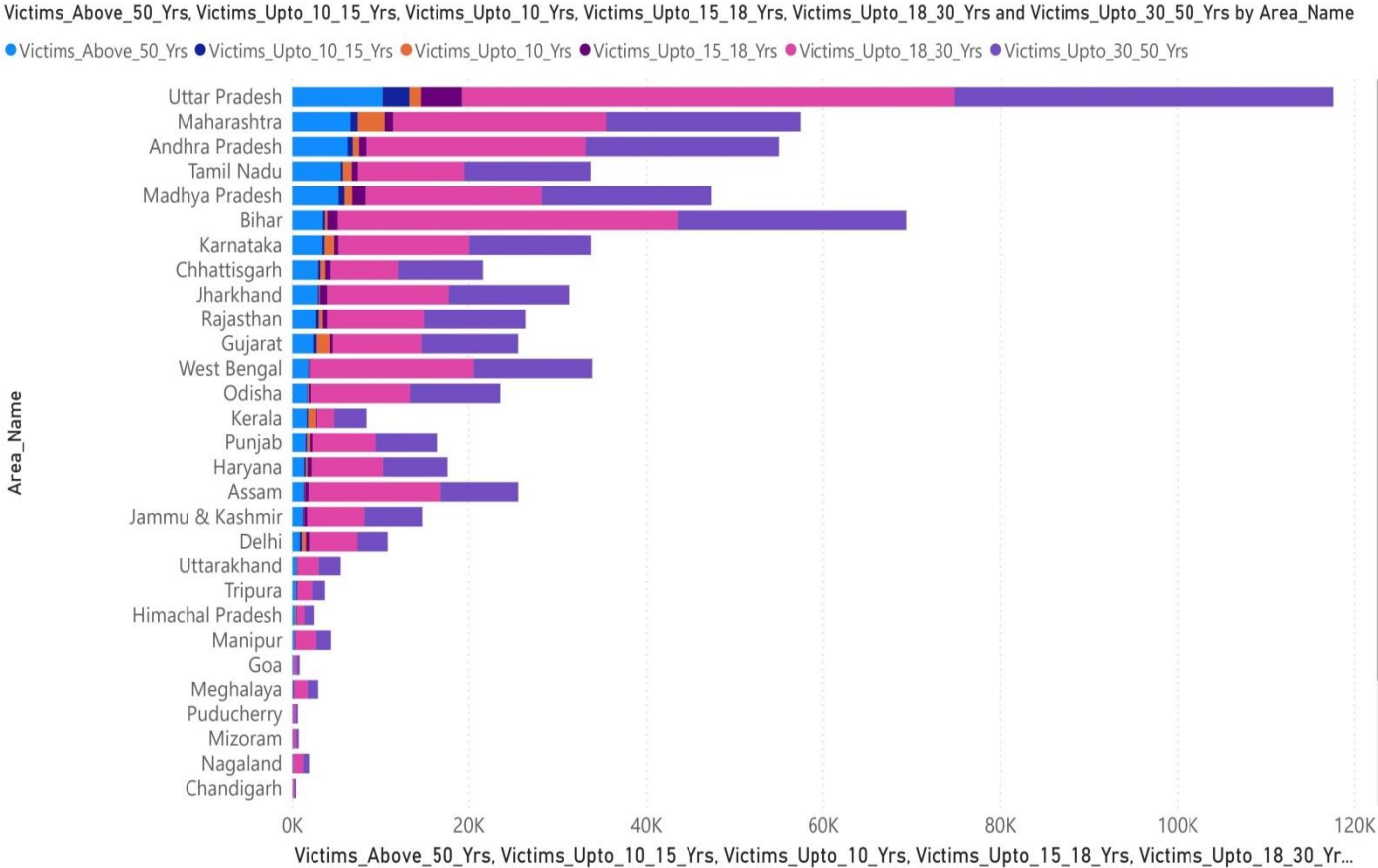


Figure-6.1.1.1 Age wise murder

6.1.2 Assault on women by State/UT

As seen here Madhya Pradesh occurred more assault on women with intent to outrage her modesty .which center of country .here sex ratio 931 male 37,612,306 and female 35,014,503 .and literacy of male 78.73% and female 59.24%.here most of the people are Hindu religion .

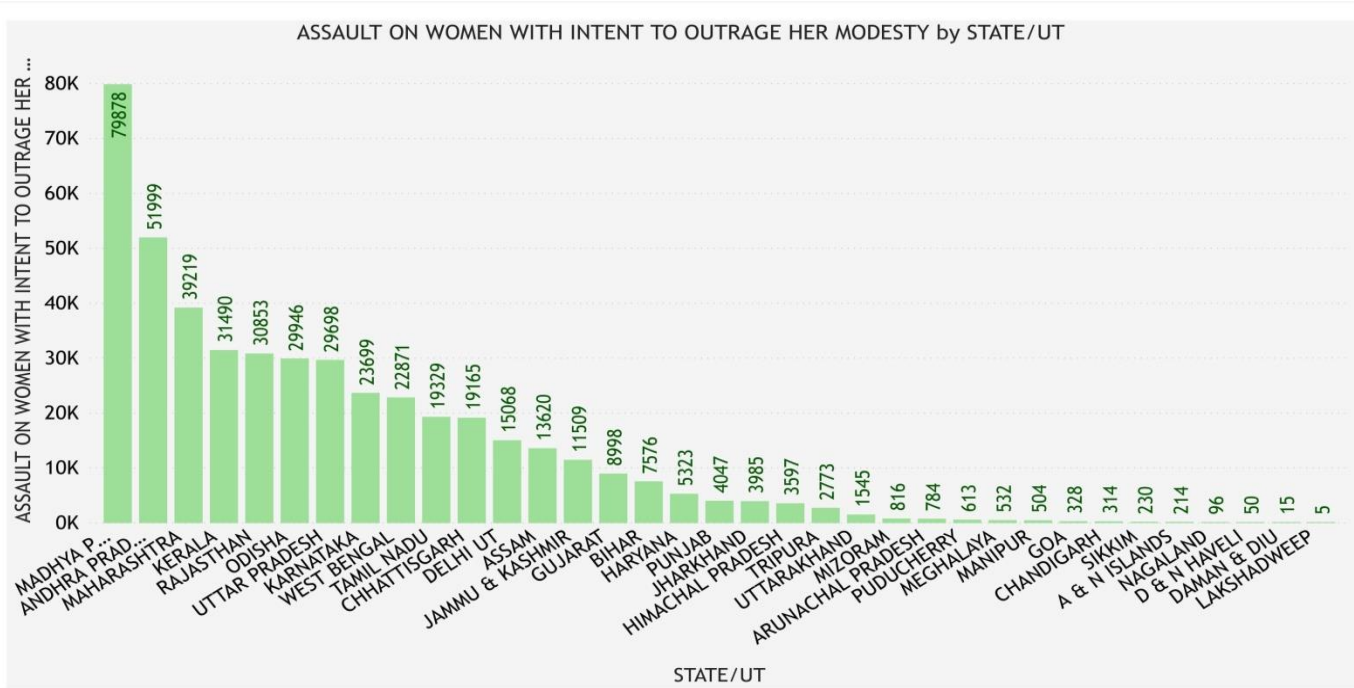


Figure-6.1.2 Assault on women by State/UT

6.1.3 Arson by state wise

Maharashtra is Western zoon of country. Its population is second highest. In the FBI report half of all arsons are committed by those younger than 18 .the other half is typically in their late 20s .in arson cases involving older people the motivation usually for profit .arson accounted for 50.5% of all fires attended in 2017/18 by fire.

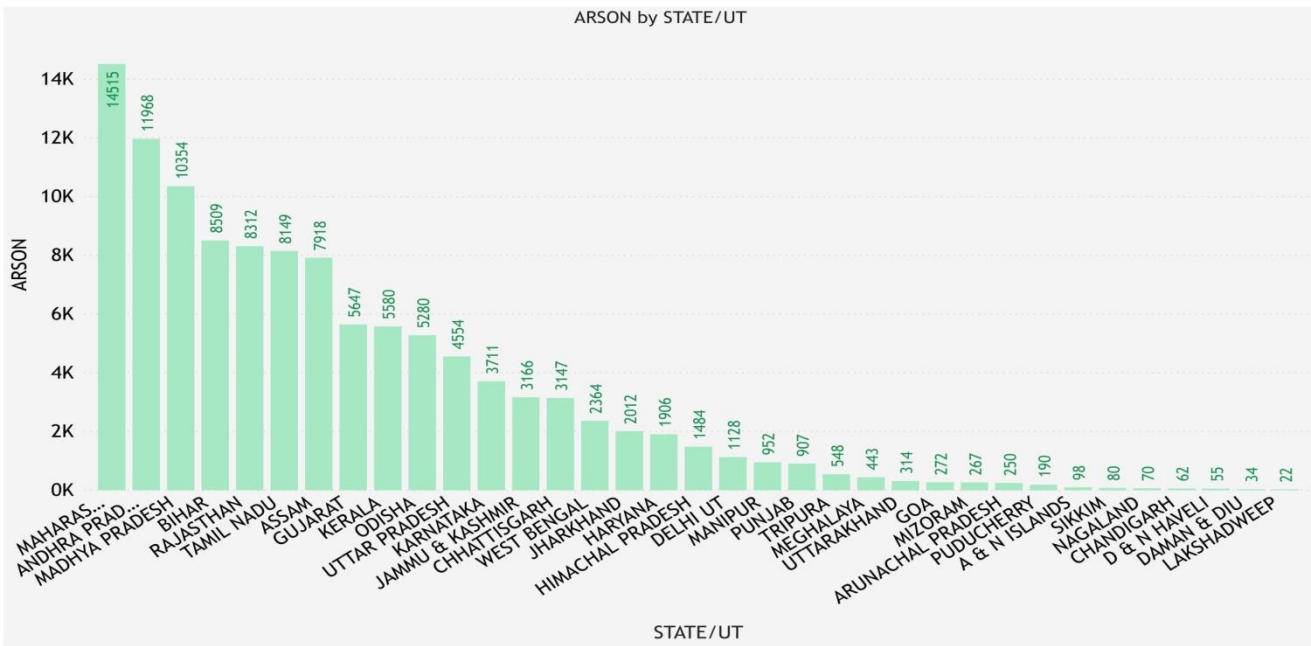


Figure-6.1.3 Arson by state wise

6.1.4 Attempt to murder by State/UT

Similar to murder Uttar Pradesh also holds the number one position for of attempted to murder and then Bihar and Madhya Pradesh is also 2nd and 3rd .for lowest rate it's also similar .the point to look at here is the proportional relationship between the population and crime .

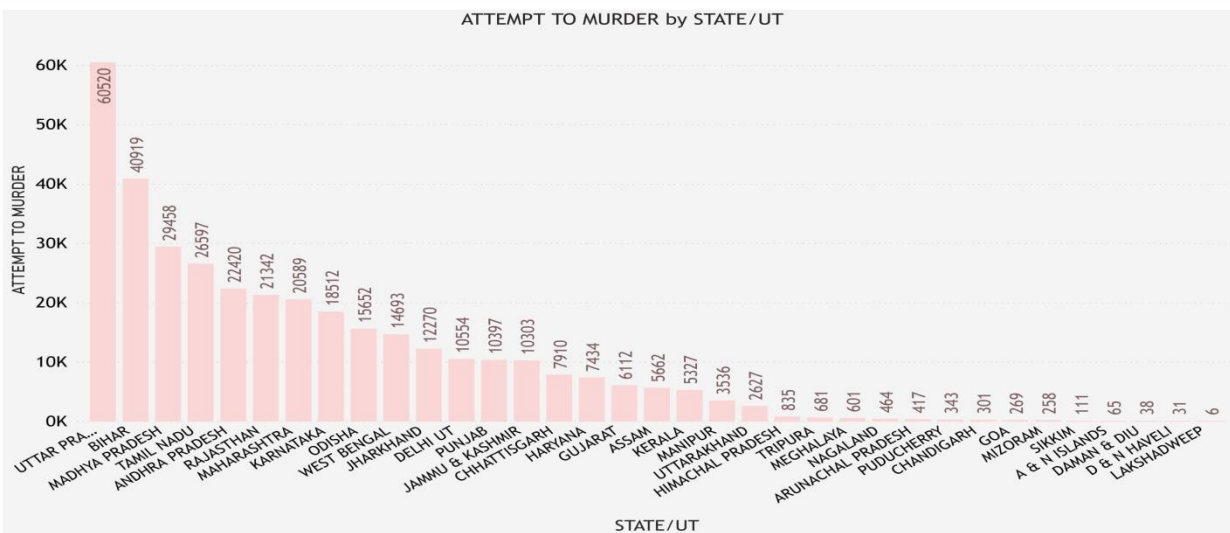


Figure-6.1.4 Attempt to murder by State/UT

6.1.5 Burglary by state/UT

Maharashtra has won the first place for burglary .it is a populous state Density/km2 365 .Literacy 82.34 % and GSDP 12, 80,369. Then Madhya population 6.00% and GSDP 3, 15,562 who is 2nd for burglary. Andhra Pradesh is 3rd place that’s population 6.99% GSDP 3, 79,402. Kerala and Haryana almost equal burglary occurred there Kerala’s population 2.76% GSDP 3, 64,048 And Haryana’s 2.09% GSDP 2, 97,539. Uttar Pradesh and Rajasthan burglary are almost equal.

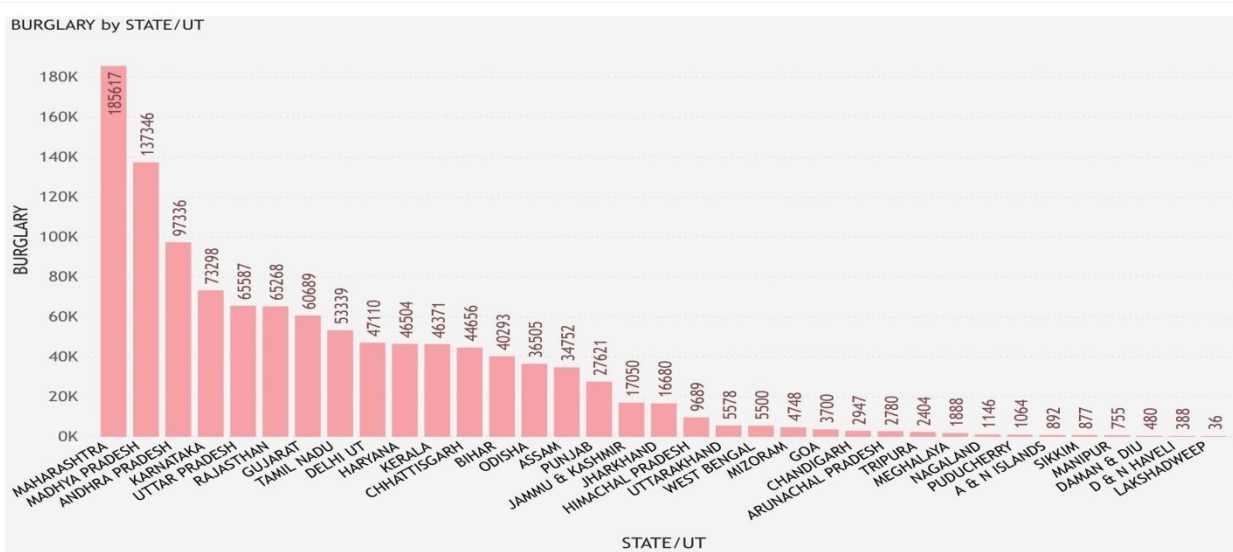


Figure-6.1.5 Burglary by state/UT

6.1.6 Counterfeiting by State/UT

Maharashtra again champion for counterfeiting .Uttar Pradesh is in its next position and then Andhra Pradesh. Middle position state for counterfeiting are Kerala, Delhi. And vary low rate counterfeiting states are Sikkim, Haveli, island and Lakshadweep.

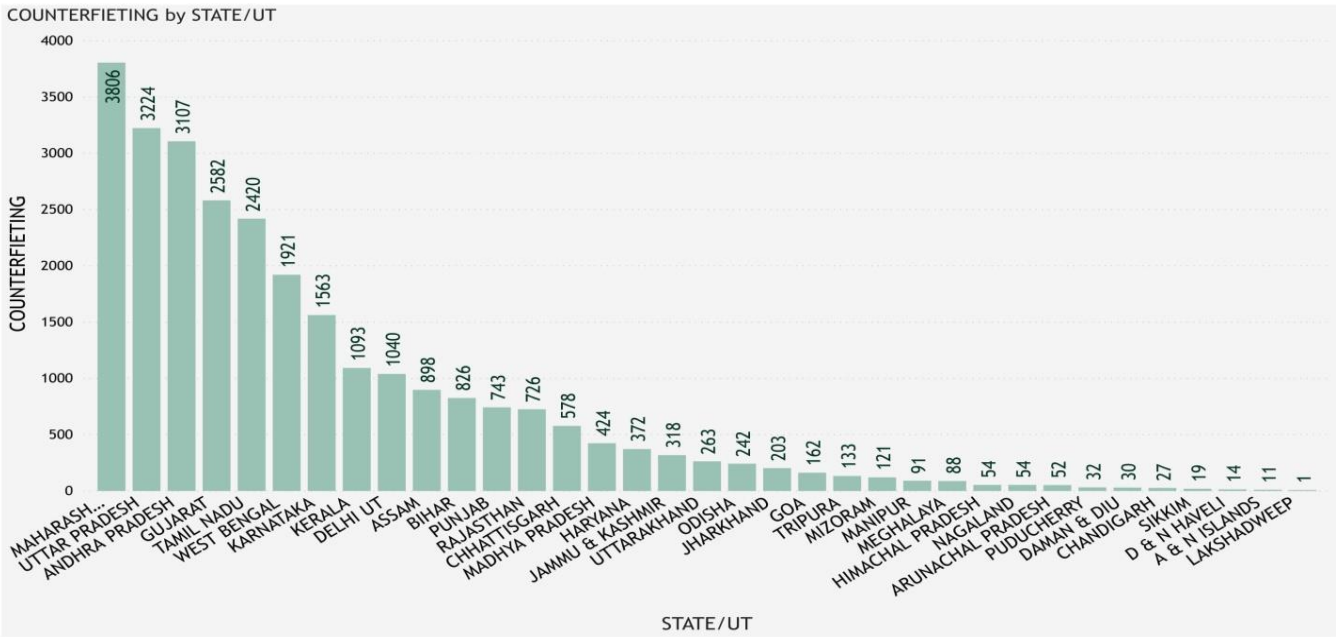


Figure-6.1.6 Counterfeiting by State/UT

6.1.7 Criminal Breach of Trust by State/UT

The offence of criminal breach of trust is classified to be a cognizable and non-bailable offence which is triable by magistrate. It highest occurred in Uttar Pradesh. Gujarat is 3rd for criminal breach of trust .it's location Western zone. Rajasthan, Delhi, Haryana, Assam, West Bengal crime rate are closely.

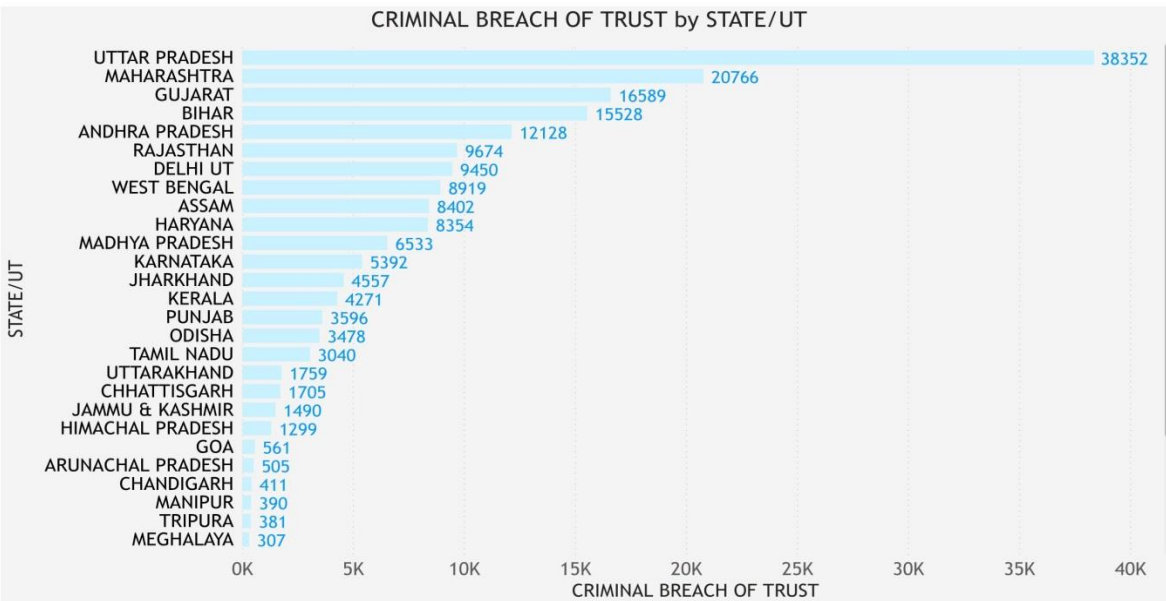


Figure-6.1.7 Criminal Breach of Trust by State/UT

6.1.8 Cruelty by Husband or his Relatives by State/UT

Cruelty by husband or his relative most occurred in west Bengal which rank is 4th by population. Sex ratio of this state is 950 total literacy 76.26% where male 81.69% and female 70.54%. Andhra Pradesh which 2nd for this crime and its position after west Bengal by population. West Bengal literacy more than Andhra Pradesh. But Andhra Pradesh crime is less than west bangle.

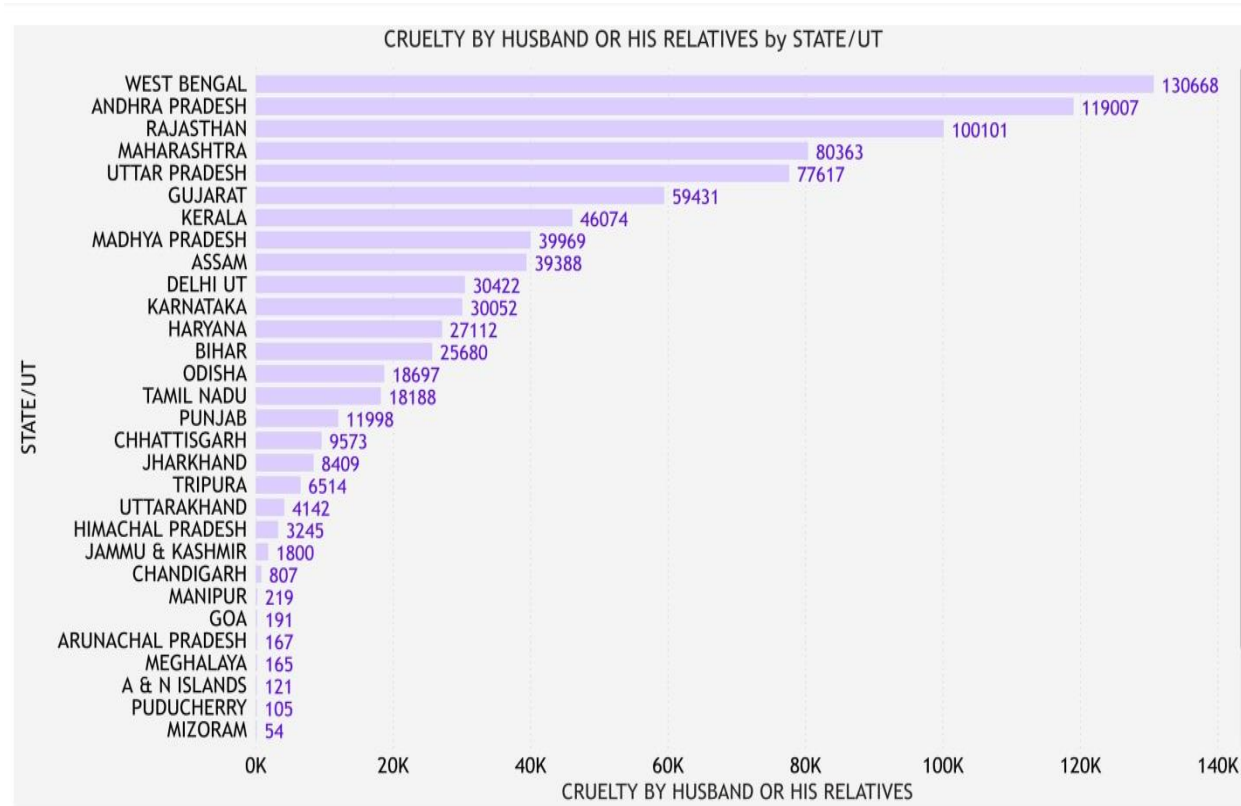


Figure-6.1.8 Cruelty by Husband or his Relatives by State/UT

6.1.9 Dacoit by State/UT

The Chambal is a topographical and social district in north – focal India .it lies along the Chambal and Yamuna stream valleys in southeastern Rajasthan south western Uttar Pradesh and northern Madhya Pradesh. It is notable for its barren wilderness and broad gorge framework that have facilitated an untold number of dacoits as seen here dacoity most occurred in Bihar. Bihar is one of the major states of the Indian union, it’s bounded on the north by Nepal on the east by west Bengal on the south by Jharkhand and west by Uttar Pradesh.

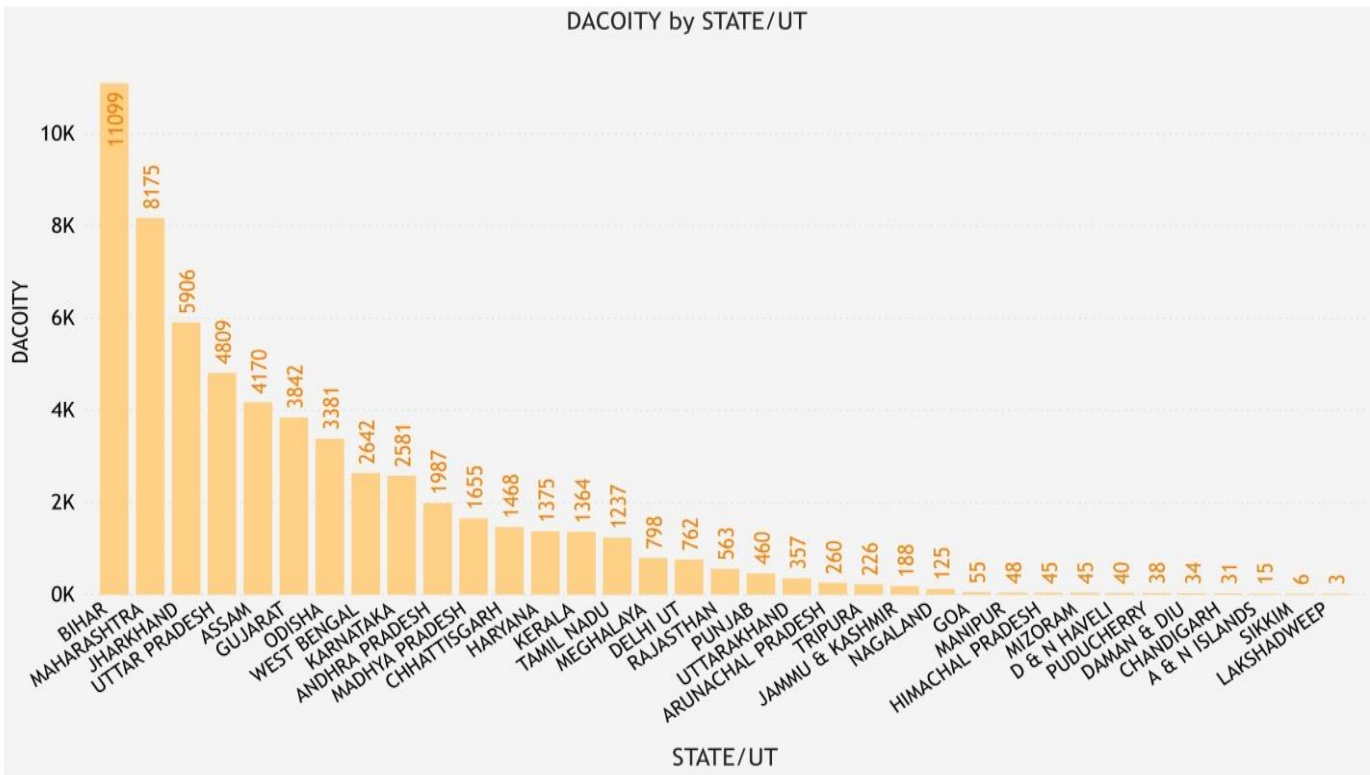


Figure-6.1.9 Dacoity by State/UT

6.1.10 Dowry deaths by State/UT

In 2016 reported dowry death cases in India amount to more than 7.1 thousand. This was a gradual decrease from the 2014, in which this number was approximately 8.5 thousand 2013 it was 8,083 2012 -8,233, 2011-8,618, 2010-8,391, 2005-6,787.

The graph show Uttar Pradesh occurred most dowry deaths .then Bihar Madhya Pradesh .Lakshadweep and Nagaland has no dowry death case failed from 2001 to 2012.

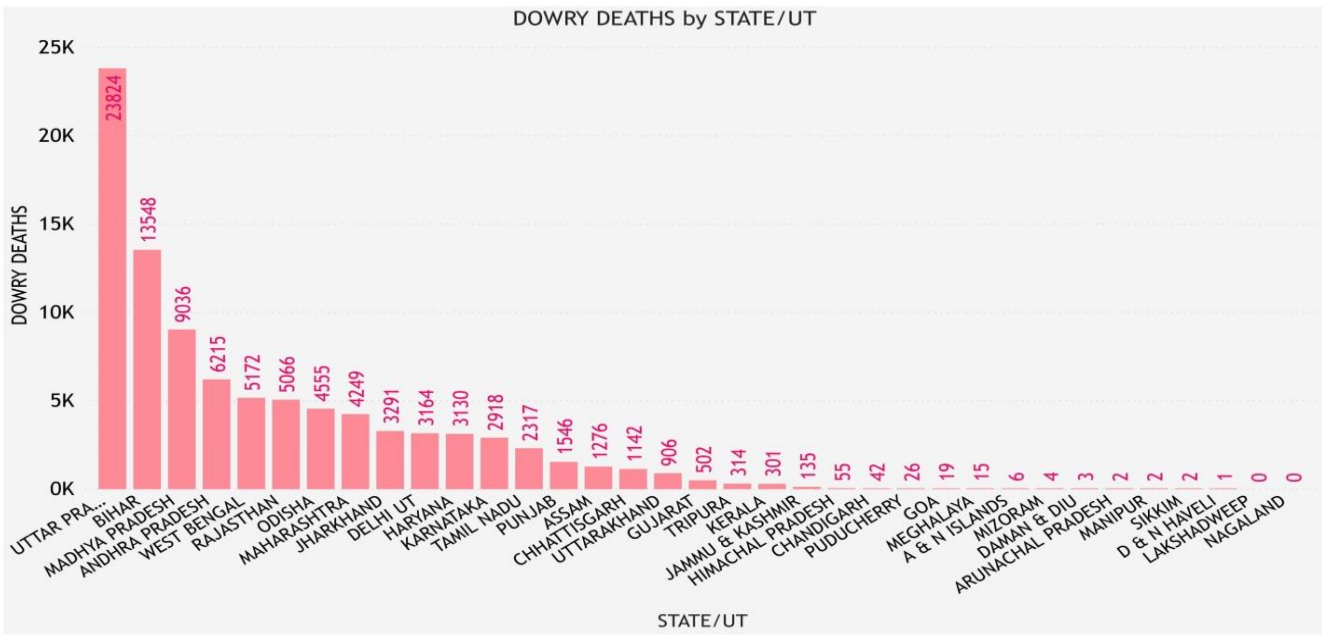


Figure-6.1.10 Dowry deaths by State/UT

6.1.11 Theft by State/UT

Theft is the most common crime in India and occur most from other crime .here show Maharashtra highest theft occurred but at present according to NCRB data of the 249,000 criminal cases filed by the state police in 2018 nearly 80% were related to theft . One third of all thefts in Delhi. In the small state theft occur competitively less.

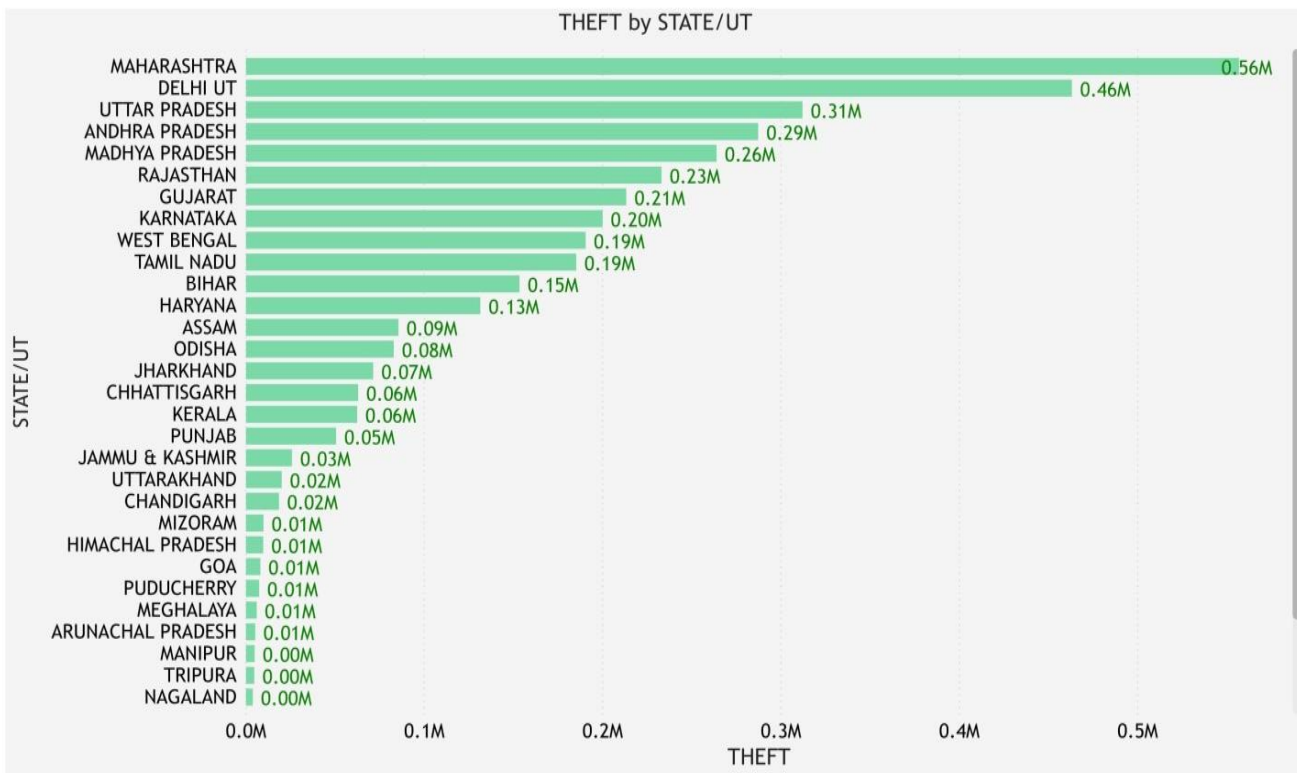


Figure-6.1.11 Theft by State/UT

6.1.12 Kidnapping & Abduction by State/UT

Kidnapping is the unlawful transportation, asportation and confinement of a person against their will. Thus, it is a composite crime. In global kidnapping hotspots, India is 9th on 1999, 3rd on 2006 and 2nd on 2014. In India, kidnapping hotspots are Uttar Pradesh, Delhi, Tamil Nadu, Gujarat, Maharashtra's kidnapping rate are closely. Goa, Nagaland, Chandigarh's kidnapping rate are comparatively low.

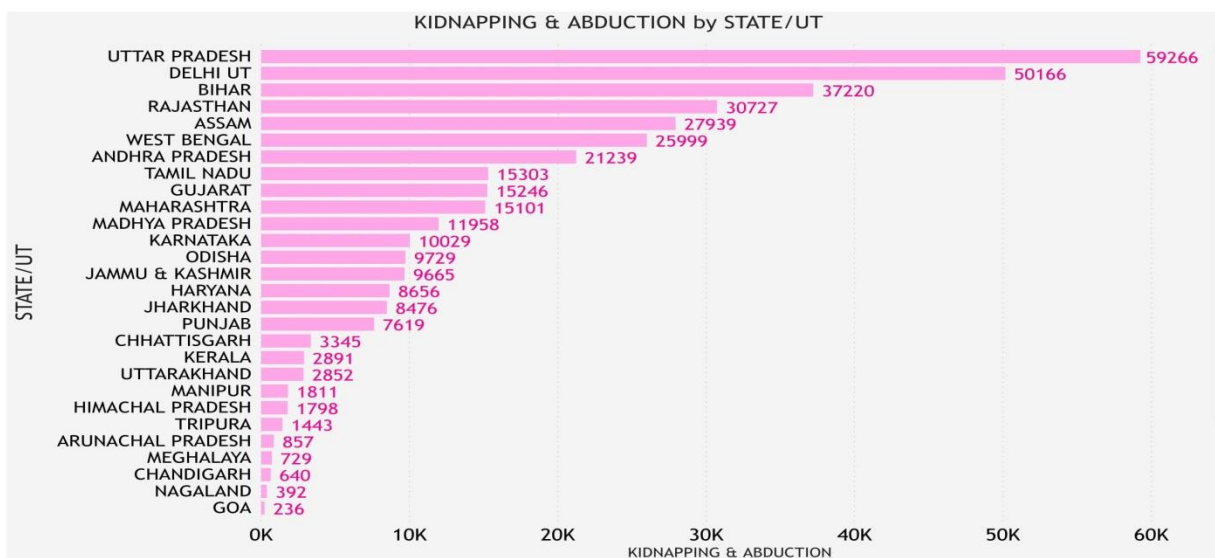


Figure-6.1.12 Kidnapping & Abduction by State/UT

6.1.13 Riots by State/UT

Religious violence in India incorporates demonstrations of viciousness by adherents of one strict gathering against devotees and organizations of another strict gathering, frequently through revolting strict brutality in India has commonly elaborate Hindus and Muslims. An Indian report said “riots incidence rates per 100,000 people in india during 2012.kerala reported the highest riot incidence rate in 2012, while Punjab and Meghalaya reported zero riot incidence rates”.

Year	Incidents	Deaths	Injured
2005	779	124	2066
2006	698	133	2170
2007	761	99	2227
2008	943	167	2354
2009	849	125	2461
2010	701	116	2138
2011	580	91	1899
2012	668	94	2117
2013	823	133	2269
2014	644	95	1921
2015	751	97	2264

2016	703	86	2321
2017	822	111	2384

Table 6.1.13 Riots Statistical report

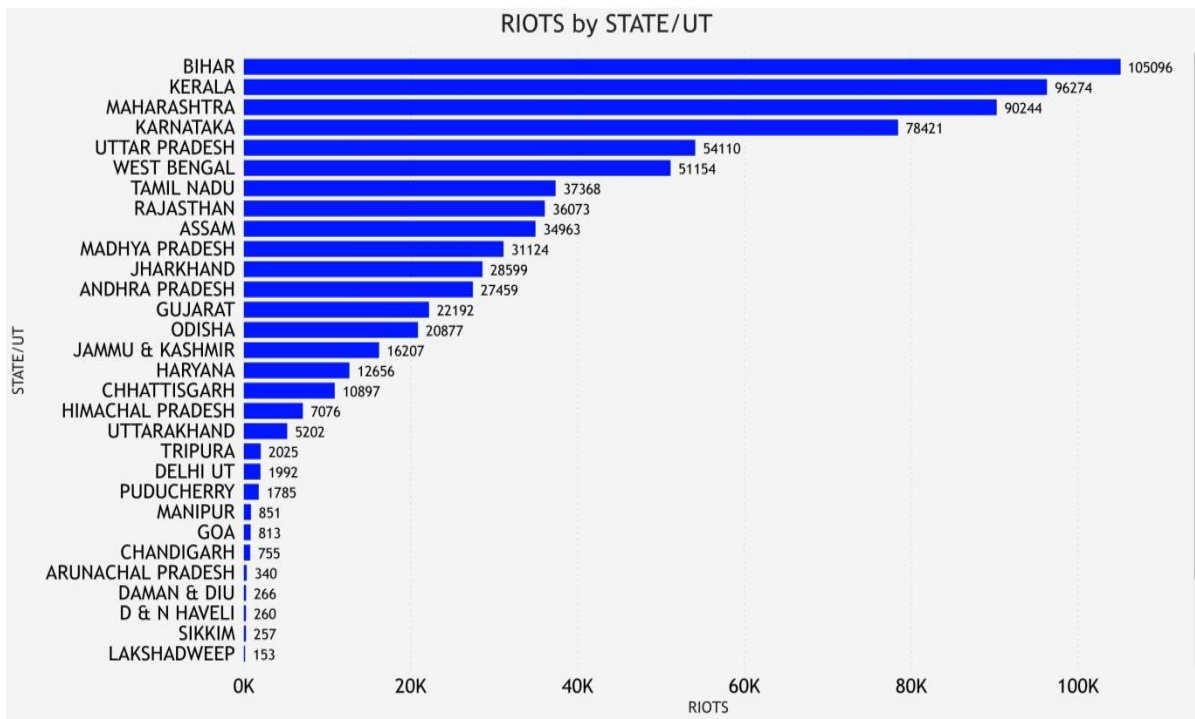


Figure-6.1.13 Riots by State/UT

6.1.14 Robbery by State/UT

In 2004 ,robbery rate for india was 1.6 cases per 100,000 population robbery rate of india increased from 1.6 cases per 100,000 population in 2004 to 2.8 cases per 100,000 population in 2013 growing at an average annual rate of 6.69%.

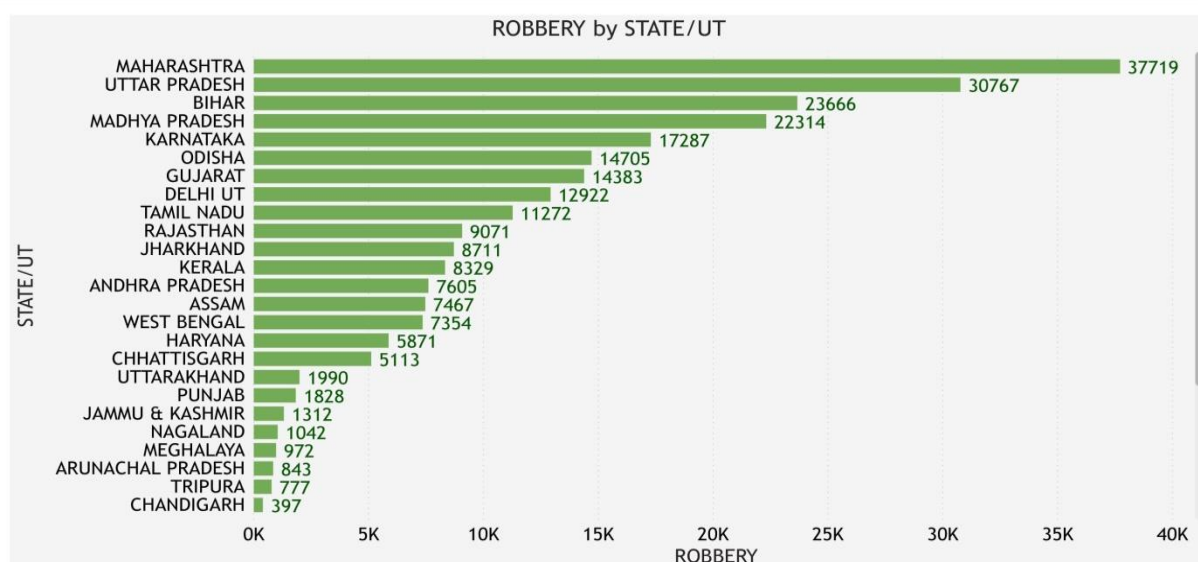


Figure-6.1.14 Robbery by State/UT

Year	Rate	Change of Rate
2004	1.6	
2005	1.5	-5.75%
2006	1.6	2.83%
2007	1.6	2.13%
2008	1.7	5.68%
2009	1.8	7.67%
2010	1.9	2.99%
2011	2.0	4.24%
2012	2.5	26.60%
2013	2.8	13.84%

Table 6.1.14 statistical report of Robbery

6.1.15 Cheating by State/UT

Rajasthan was top for cheating. in cheating offence include deception and cheating in connection with false promise of marriage ,dishonest intention should be present at time of making the promise ,absence of intention to honor the promise at the time of false representation ,dishonesty is causing either wrongful loss ,false pretense to be inferred from circumstances and men’s rea as essential ingredients of the offence of cheating .

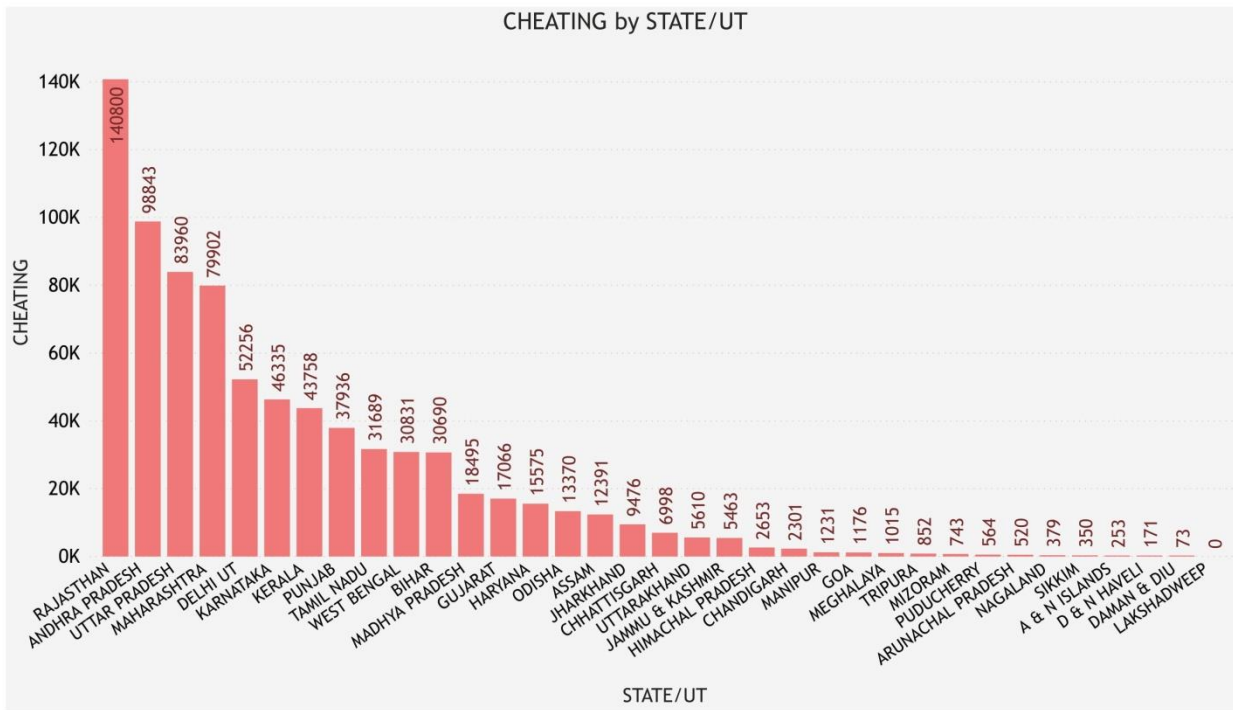


Figure-6.1.15 Cheating by State/UT

6.1.16 Hurt/Grievous by State/UT

A large share of criminal cases more specifically in the courts of judicial magistrate first class in india is hurt cases. In the bar chart we show Andhra Pradesh failed highest hurts cases .

Simple hurt	Grievous hurt
Bodily pain	Voluntarily causing grievous hurt
Infirmity to another	Causing hurt or grievous hurt by Dangerous weapons

Disease	Causing hurt or grievous hurt on provocation
Intention or knowledge	Dangerous weapons or dangerous means

Table 6.1.16 Hurts cases categories

Causing grievous hurt by use of acid or extort property .causing hurt or grievous hurt occurred means of poison , to deter public servants and endangering life of personal safety of others .

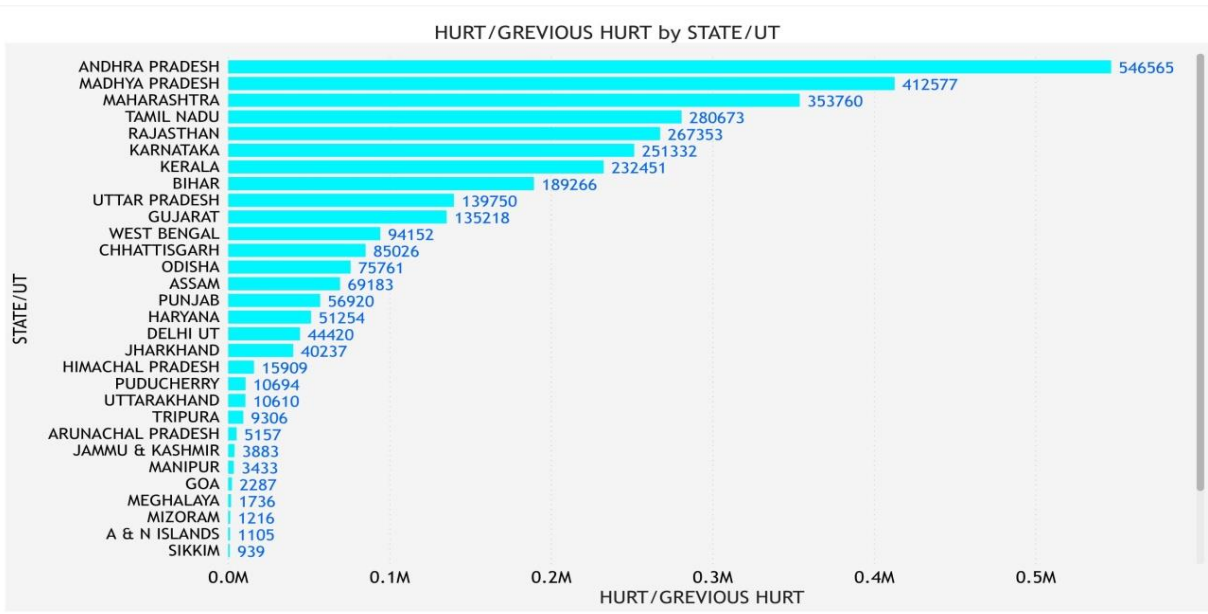


Figure-6.1.16 Hurt/Grievous by State/UT

6.1.17 Insult to Modesty of women by State/UT

Violence and crime against women is the most insidious yet least recognized human rights abuse in the world .violence against women in india among many communities goes unreported on regular basis presently ,women are considered only as sex object and they are treated inferior to men at different phases of life .in rural areas women are tortured wives are beaten burnt torture of unmarried women etc are some of the common phenomenon . Andhra Pradesh was top for insult to modesty of women where literacy 67.02% male literacy 74.88% Female literacy 59.15% on the other hand Lakshadweep 0 insult to modesty of women where literacy 91.85% male literacy 95.56% and female literacy 87.95%.

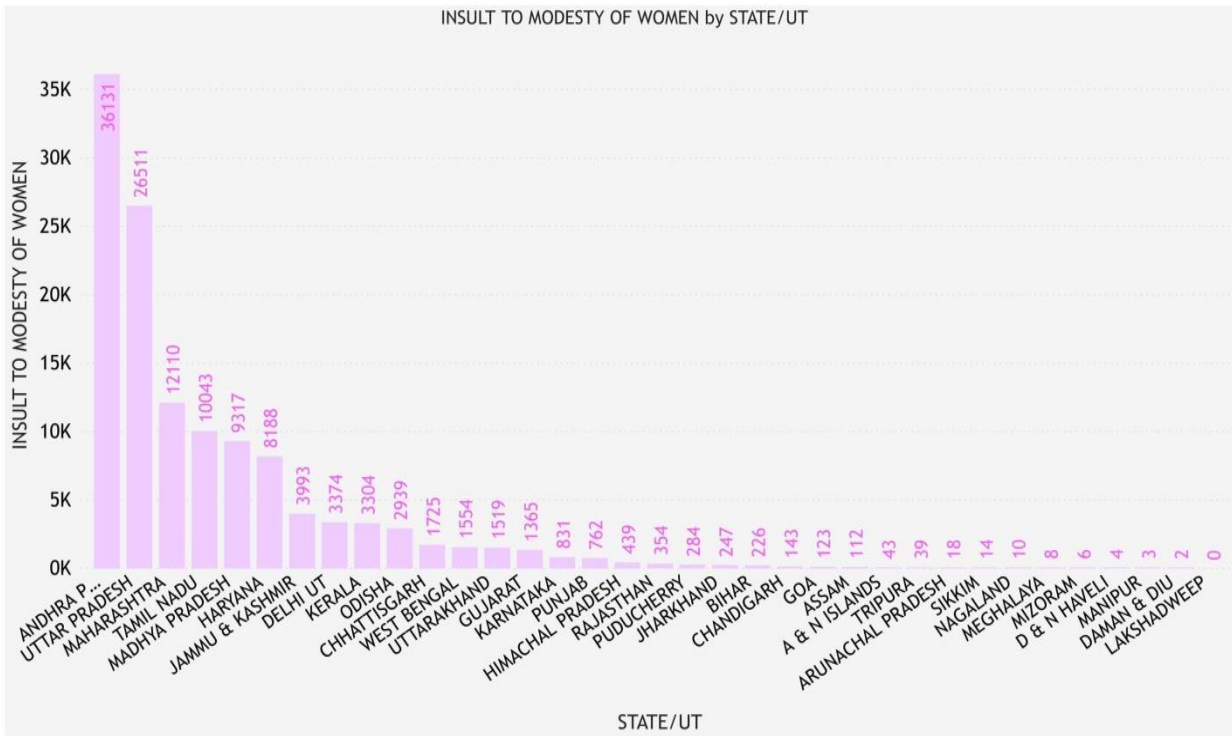


Figure-6.1.17 Insult to Modesty of women by State/UT

6.1.18 Other IPC Crime by State/UT

The Indian penal code is the main document which governs all criminal acts and the punishments they ought to be charged with .the objective of enacting the IPC was to provide a general and exhaustive penal code for crime in India .however there are several other offences in addition to the IPC .in animal law , a notable such statute is the prevention of cruelty against animals act. In order to be held liable under the IPC, the accused must possess both guilty mind and guilty act. More cases were filed in Madhya Pradesh and Tamil Nadu .

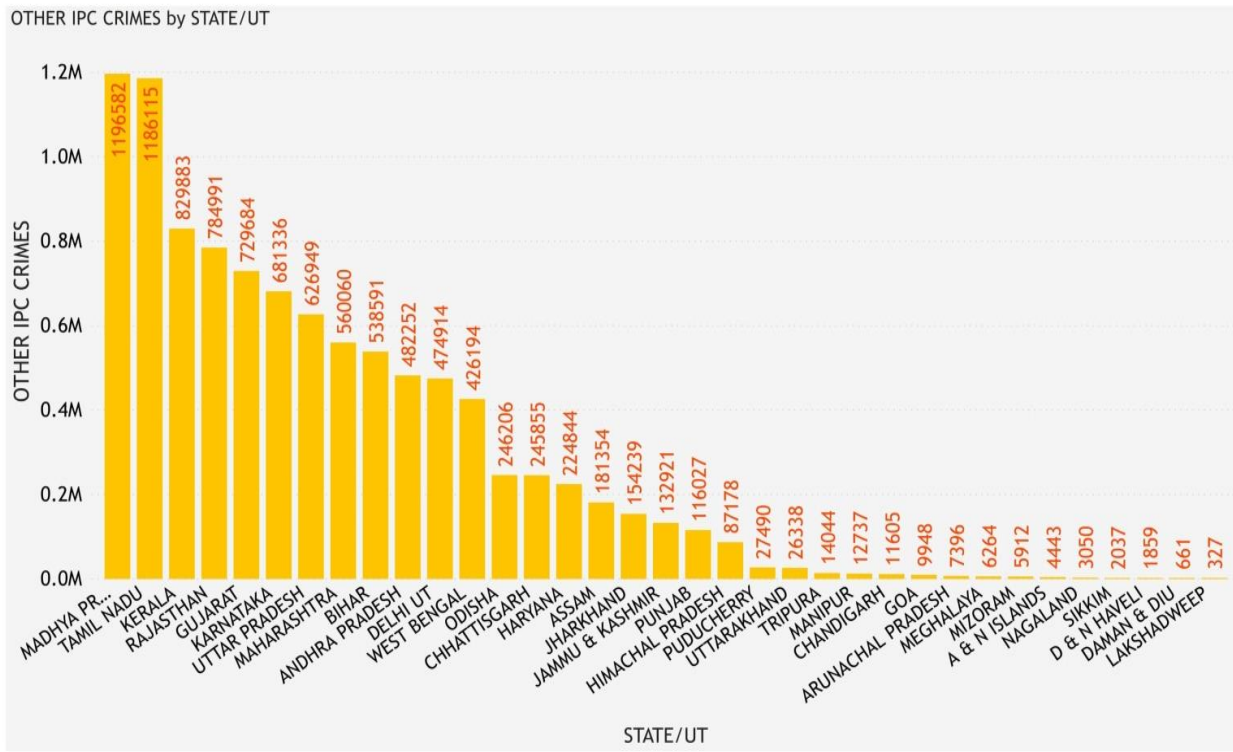


Figure-6.1.18 Other IPC Crime by State/UT

6.1.19 Total IPC Crime by State/UT

The highest number of cases has been filed in Madhya Pradesh, though the highest number of crimes have been committed in Uttar Pradesh.

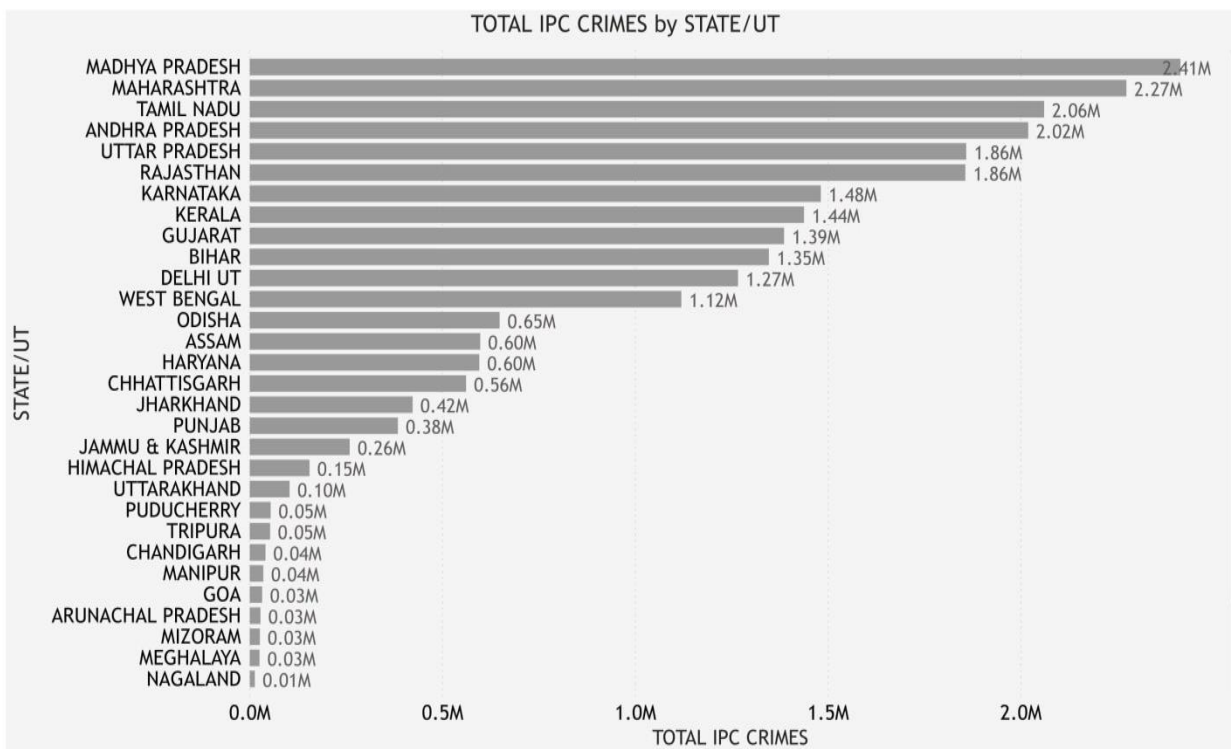


Figure-6.1.19 Total IPC Crime by State/UT

6.1.20 Rape by State/UT

Now India is 4th for rape in the world. The map showing rape hotspot by area .we see the canter of India committed most of the rape then west Bengal, Uttar Pradesh ,Maharashtra occurred rape more .over 338 thousand cases of crime reported against women in India 33 thousand were for rape in 2018 .in 2018 more than 93 percent of rapes were committed by someone known to their victim .even though many rapes are not reported cause it is an issue that continuously makes news headlines .As seen from a statistic total number of rape cases reported in India from 2005 to 2018 :

2005	18,359
2010	22,172
2011	24,206
2012	24,923
2013	33,707
2014	36,735
2015	34,651

2016	38,947
2017	32,559
2018	33,356

Table 6.1.20 Statistical report of Rape

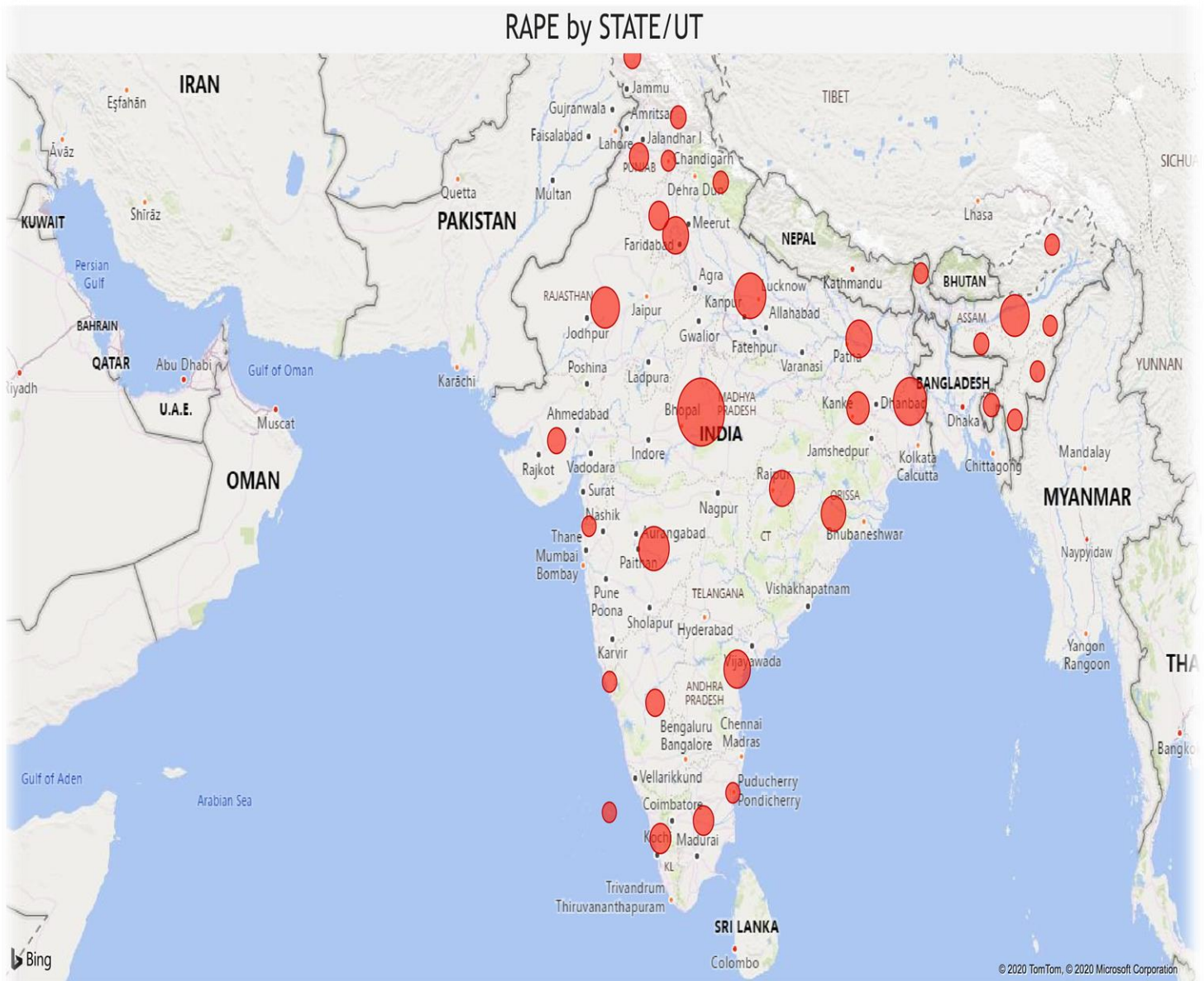


Figure-6.1.20 Rape by State/UT



Figure-6.1.20.1 Rape case recorded by State/UT

6.1.20.1 Victim age range

Here showing most of the rape victims age between 18-30 years then 2nd highest victims age between 30-50 years 3rd between 14-18 age and 4th place for victims which age range 10-14. Child rape most occurred in Maharashtra and Madhya Pradesh .above 50 years victims in Madhya Pradesh and Rajasthan .in west Bengal maximum rape victims age range between 18-30 years that was highest number from all state. Girls aged 10-14 were more likely to be raped in Uttar Pradesh and 14-18 year old girls were more likely to be raped in Madhya Pradesh.

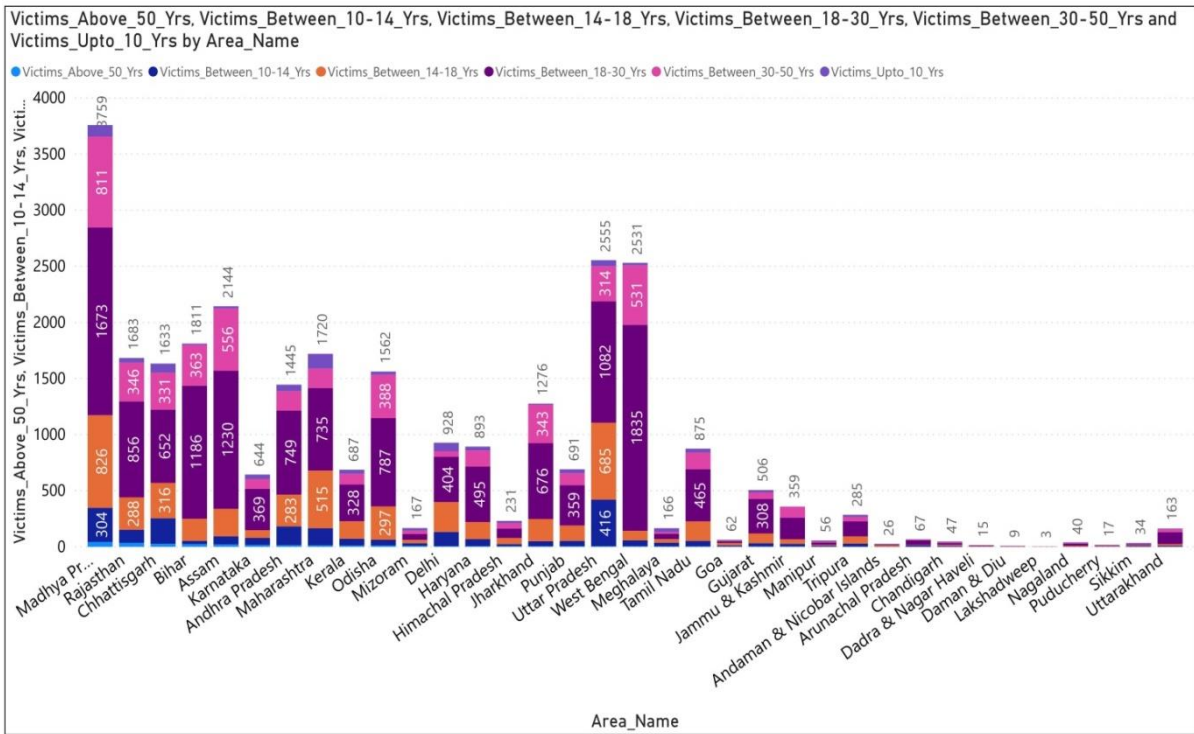


Figure-6.1.20.2 Rape victim Age range by State/UT

6.2 judiciary

The national conviction rate in India for offences of the IPC is around 46% it's varies state by state .the state with the highest conviction rate is Kerala(84%) while Bihar(10%) is lowest one state.

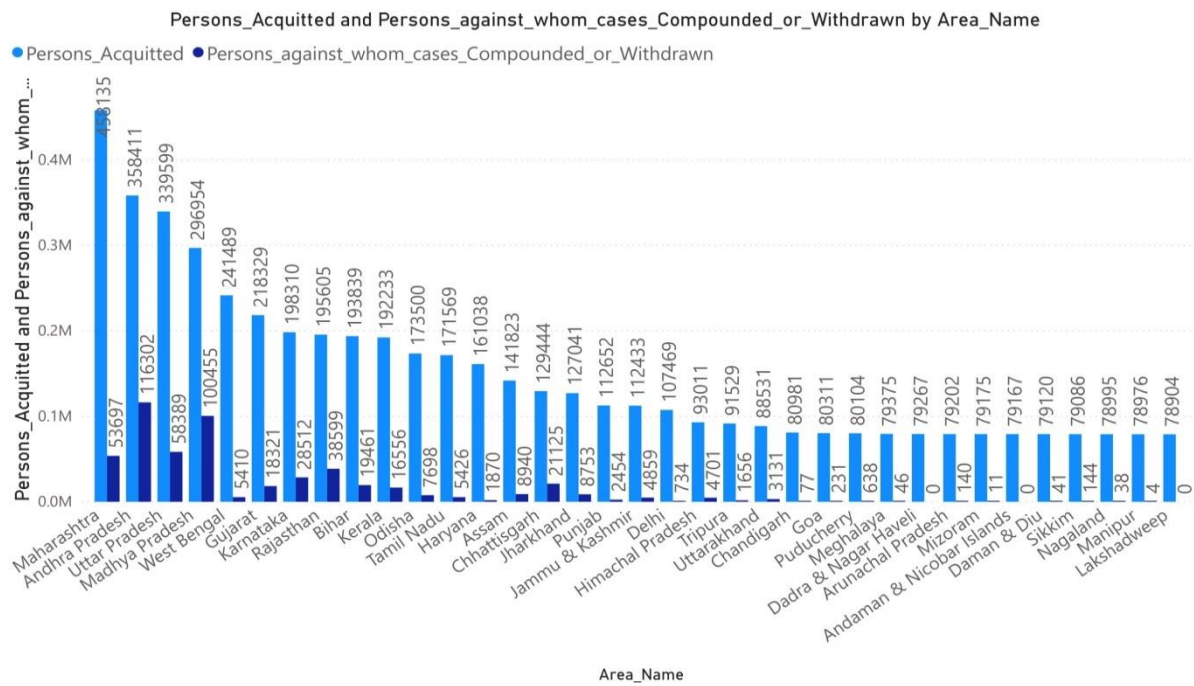


Figure-6.2.1 person acquitted and Persons against whom cases Compounded or Withdrawn by Area.

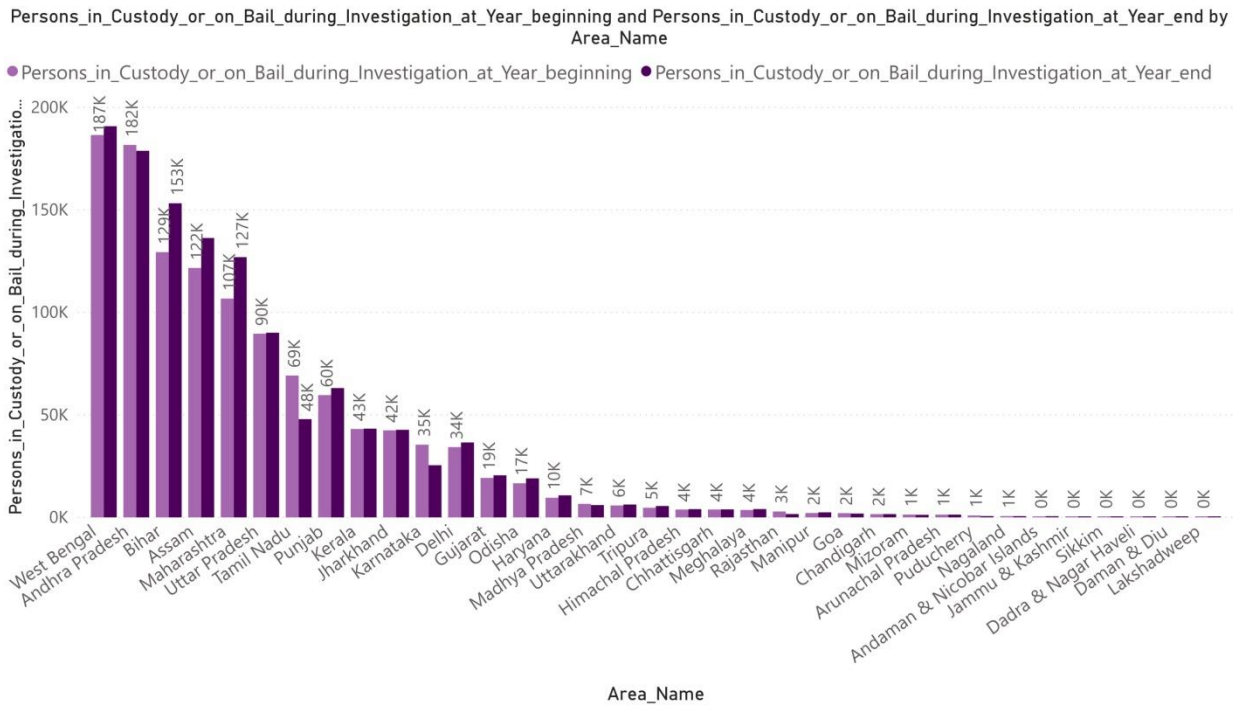


Figure-6.2.2 Persons in Custody or on Bail during Investigation at Year beginning and Persons in Custody or on Bail during Investigation at Year end by Area

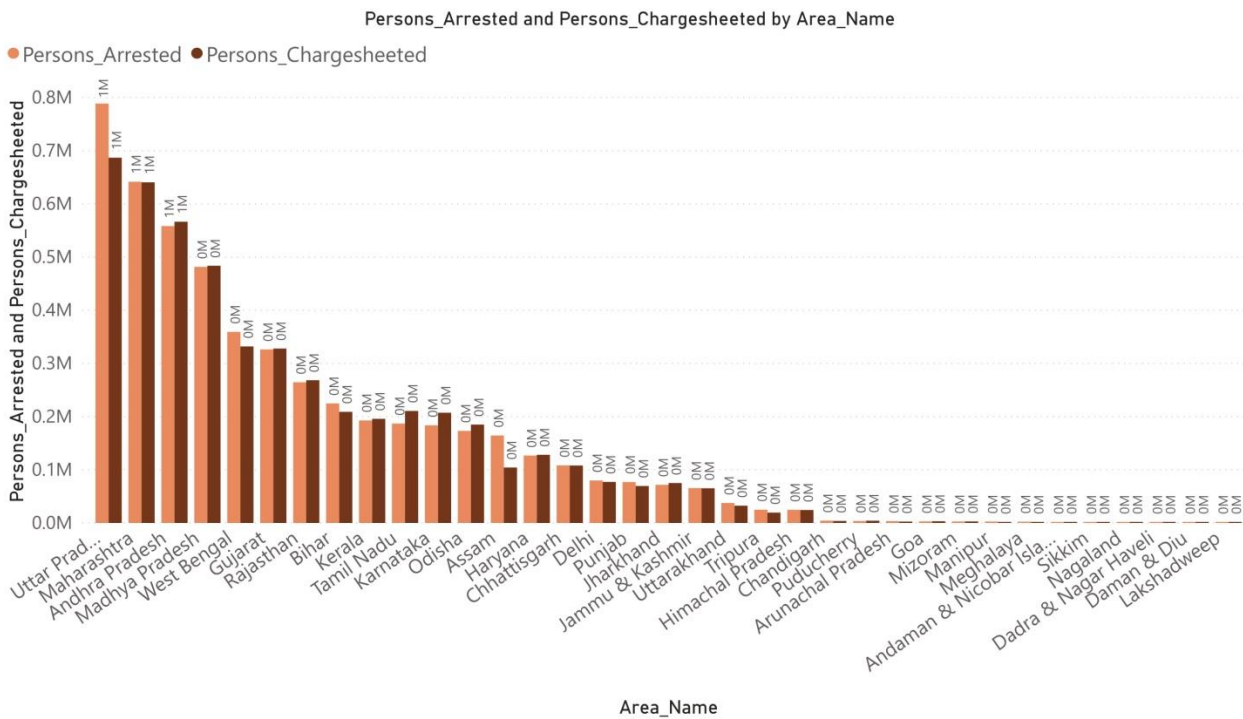


Figure-6.2.3 Persons Arrested and Persons Charge sheeted by Area

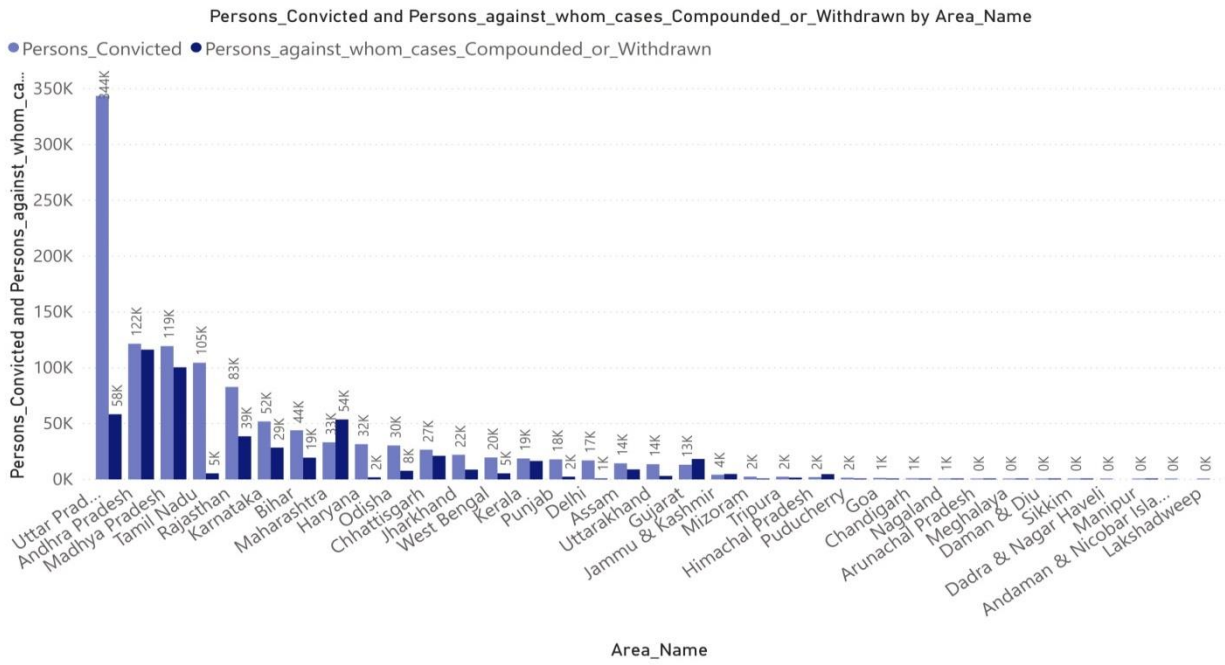


Figure-6.2.4 Persons Convicted and Persons against whom cases Compounded or Withdrawn by Area

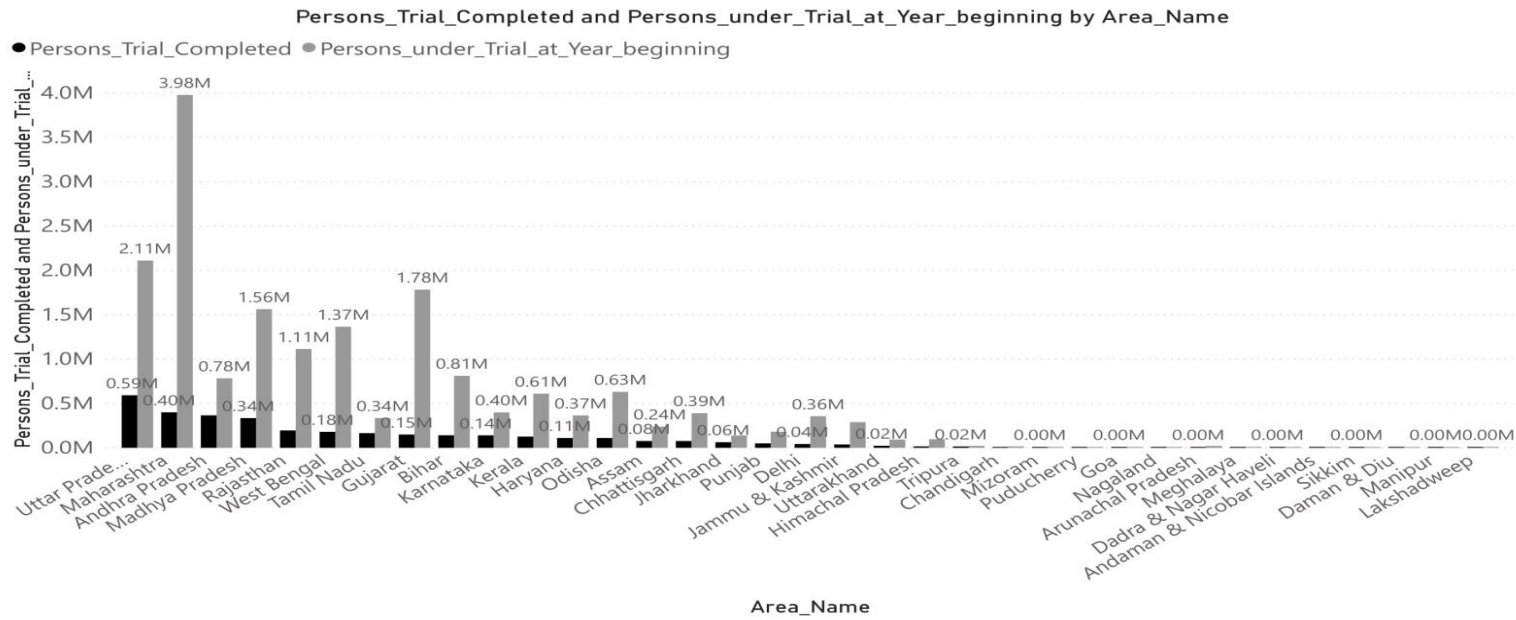


Figure-6.2.5 Persons Trial Completed and Persons under Trial at Year beginning

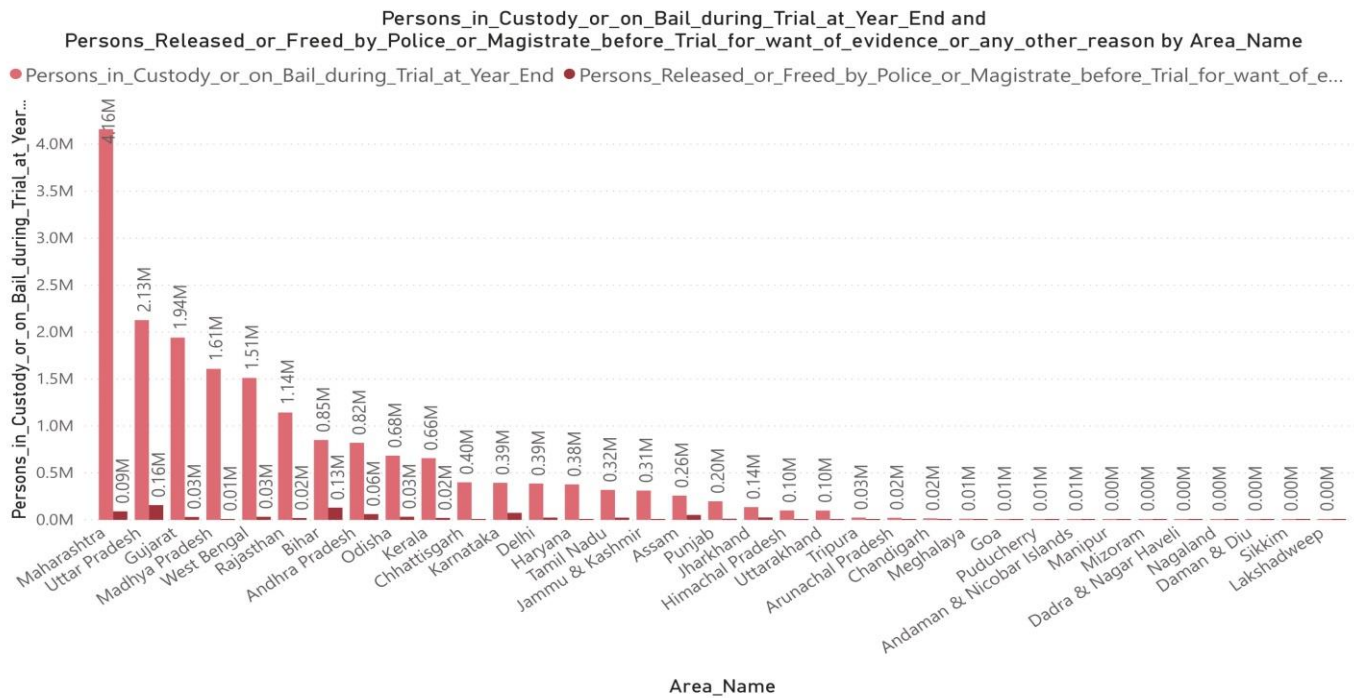


Figure-6.2.6 Persons in Custody or on Bail during Trial at Year End and Persons Released or Freed by Police or Magistrate before Trial for want of evidence or any other reason

6.3 Summary

Analysis all data we got to see highest crime sport is Uttar Pradesh. After that Madhya Pradesh is 2nd place and then Maharashtra. Those states are crowd point to be notice that all crime are lowest in Lakshadweep. Which situated Southern zone, it's population 0.01% and area 32 km² where most of the people are Muslim (96.58%).

Highest crime state	Crimes
Uttar Pradesh	<ol style="list-style-type: none"> 1. Murder(now Delhi) 2. Attempt to Murder 3. Criminal Breach of trust 4. Kidnapping 5. Dowry deaths
Madhya Pradesh	<ol style="list-style-type: none"> 1. Assault on woman with intent to outrage her modesty 2. Rape

	<ol style="list-style-type: none"> 3. Other IPC crimes 4. Total IPC crimes
Maharashtra	<ol style="list-style-type: none"> 1. Theft(now Delhi) 2. Burglary 3. Robbery 4. Counteracting 5. Arson
West Bengal	Cruelty by husband or his relative
Bihar	<ol style="list-style-type: none"> 1. Riots 2. Dacoit
Rajasthan	Cheating
Andhra Pradesh	<ol style="list-style-type: none"> 1. Hurt \ grievous hurt 2. Insult to modesty of women

Table 6.3.1 summary of analysis

6.4 Bangladesh crime

Bangladesh is a small country but the population is much higher. There are 8 division of Bangladesh and Dhaka is the capital of Bangladesh. The crime rate in Bangladesh is increasing at an alarming rate. Now show some visualization about Bangladesh crime by division and unit. Crime data collect from Bangladesh police website” 2019 statistical crime report”

Unit name	Full name
DR	Dhaka Range
MR	Mymensingh Range
CM	Chittagong metropolitan
SR	Sylhet Range
KR	Khulna Range
BR	Barisal Range
RAJR	Rajshahi Range
DMP	Dhaka metropolitan police
CMP	Chittagong metropolitan police
KMP	Khulna metropolitan police
RMP	Rajshahi metropolitan police
BMP	Barisal metropolitan police
SMP	Sylhet metropolitan police
GMP	Gazipur metropolitan police
RPMP	Rangpur metropolitan police
ATU	Anti-terrorism unit
RAIR	Anti-terrorism unit(Bogra)

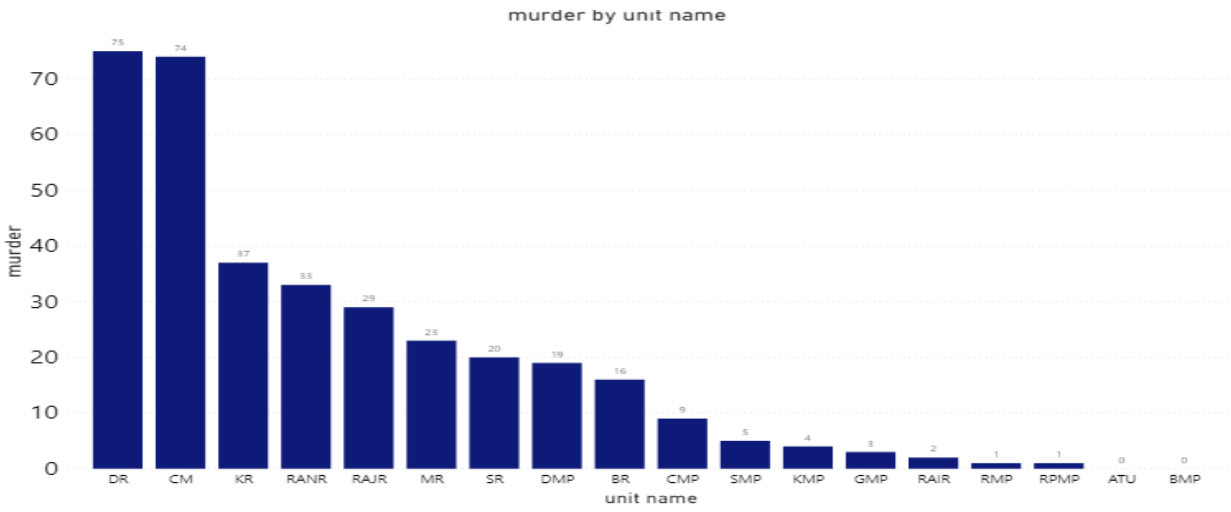


Figure-6.4.1 Murder by unit

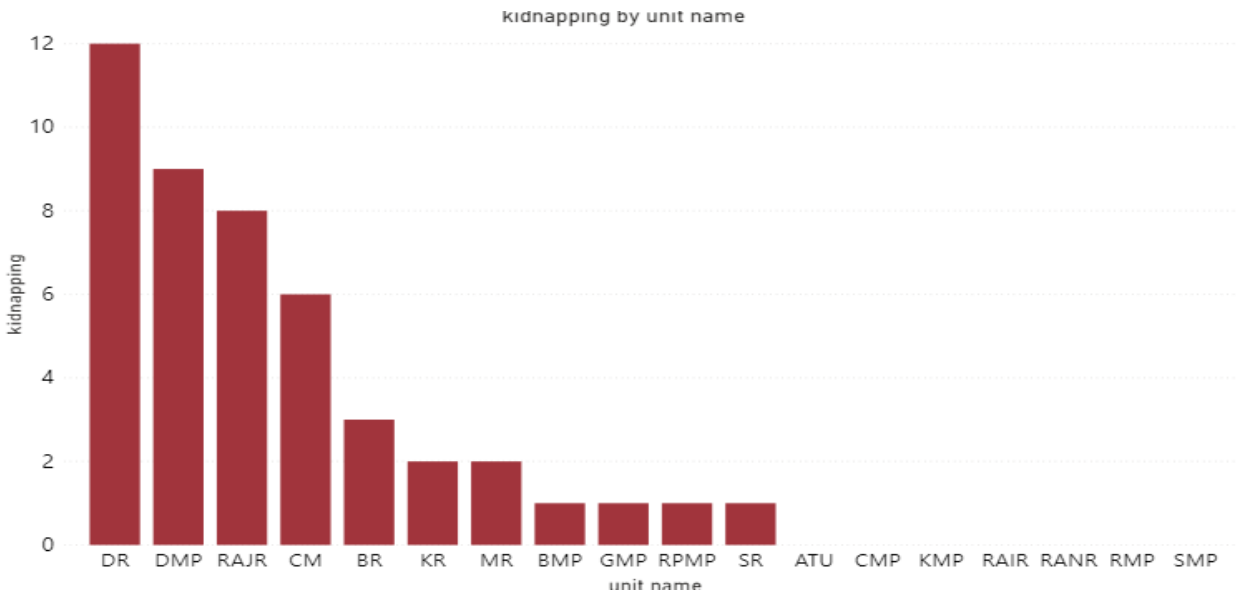


Figure-6.4.2 kidnapping by unit

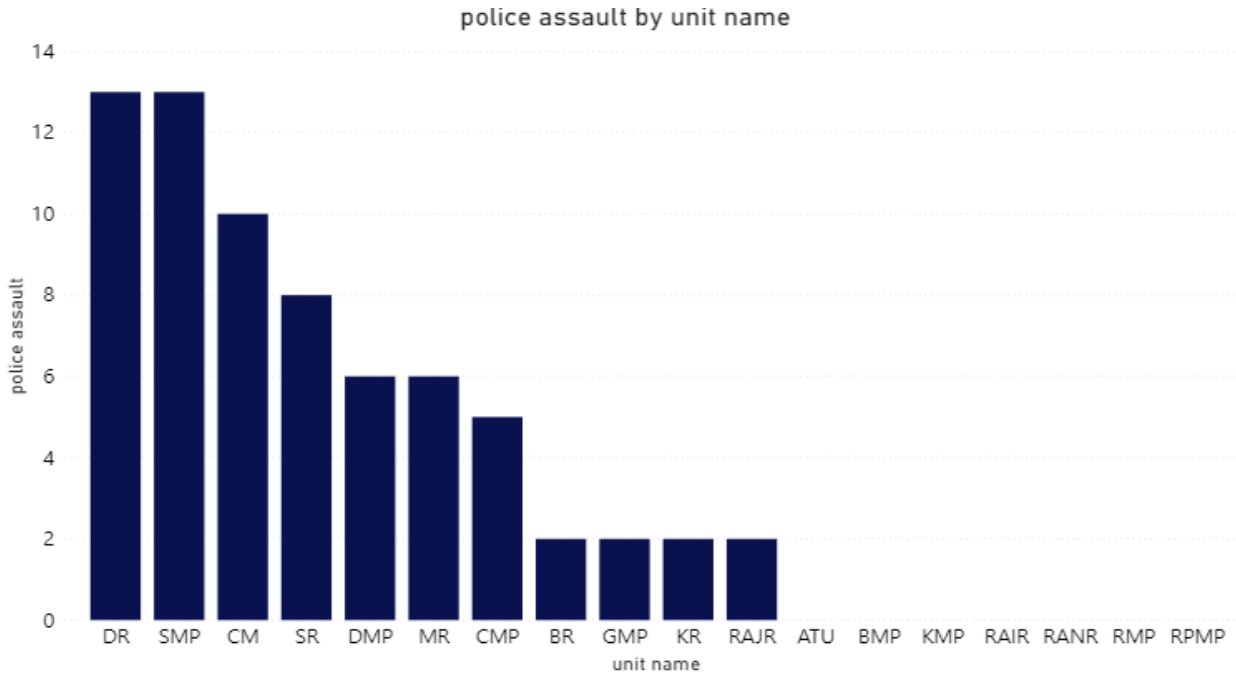


Figure-6.4.3 police assault by unit

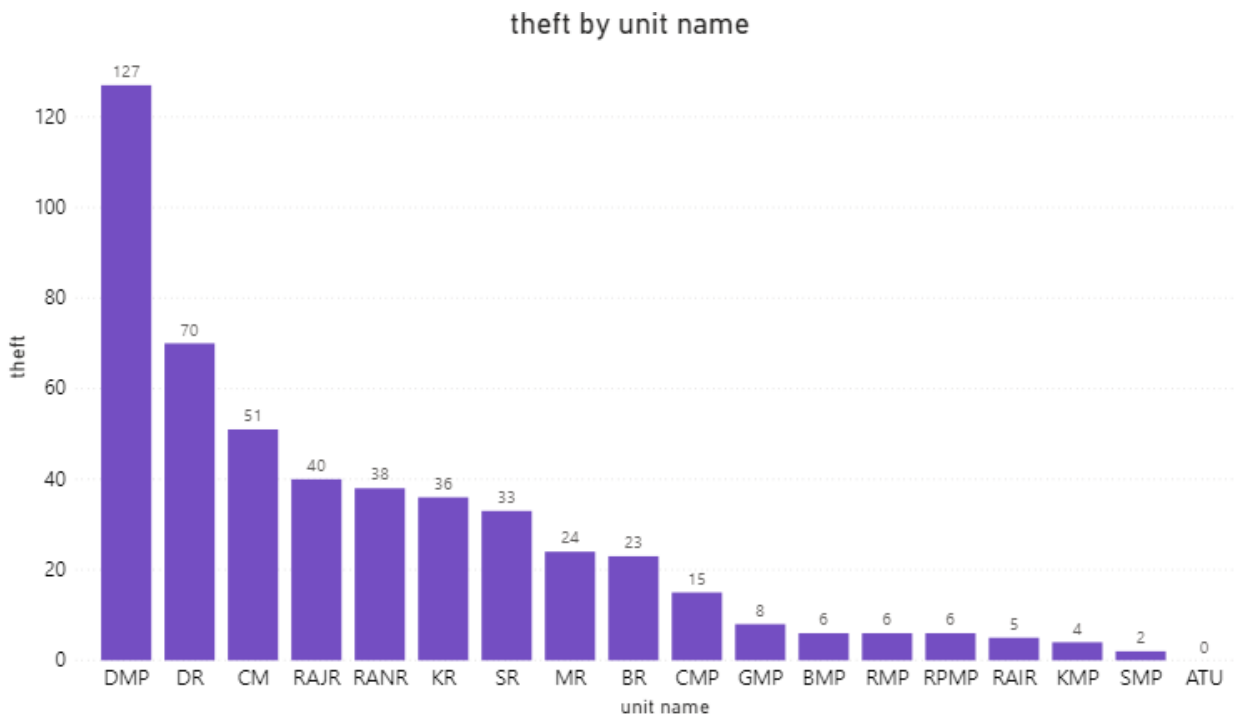


Figure-6.4.4 theft by unit

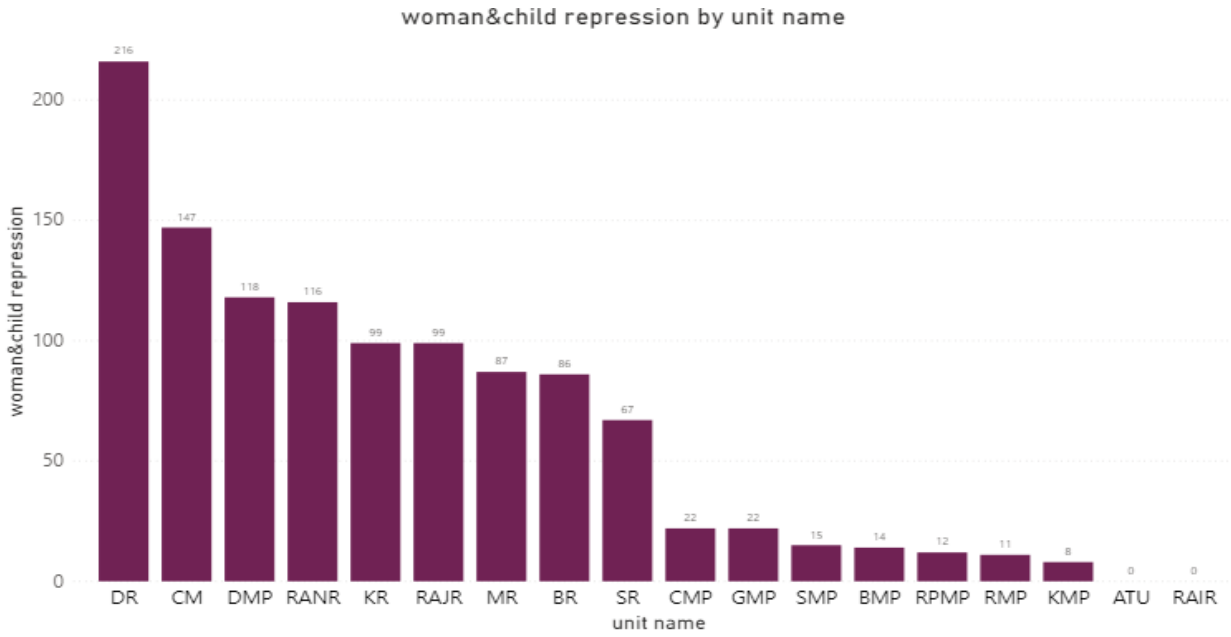


Figure-6.4.4 woman & child repression theft by unit

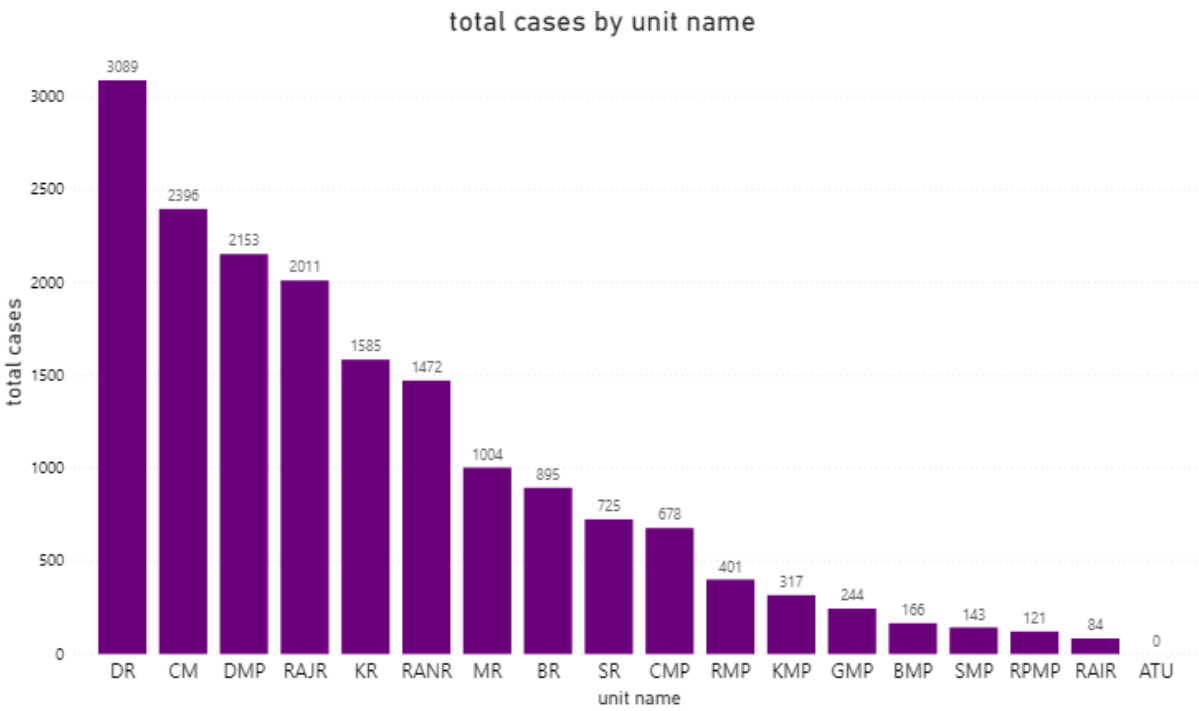


Figure-6.4.5 total by unit

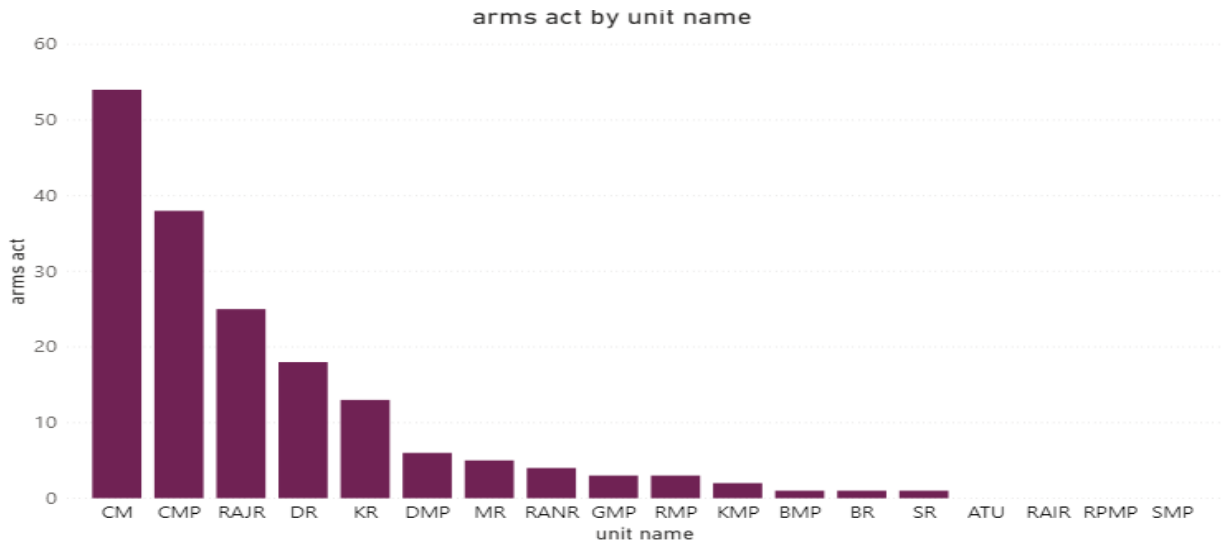


Figure-6.4.6 arms act by unit

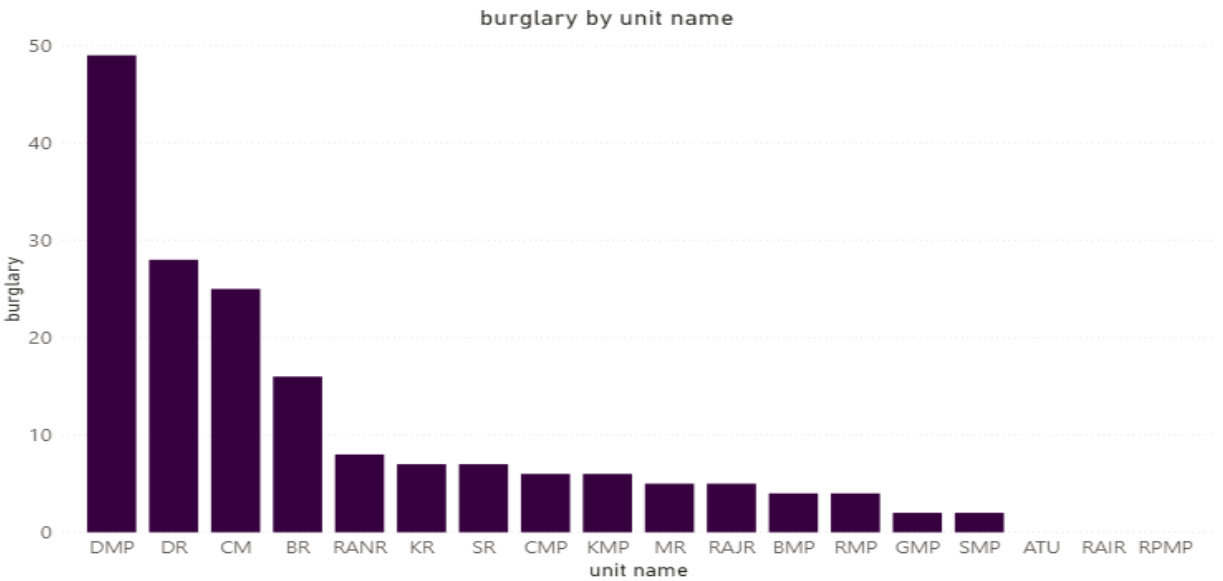


Figure-6.4.7 burglary by unit

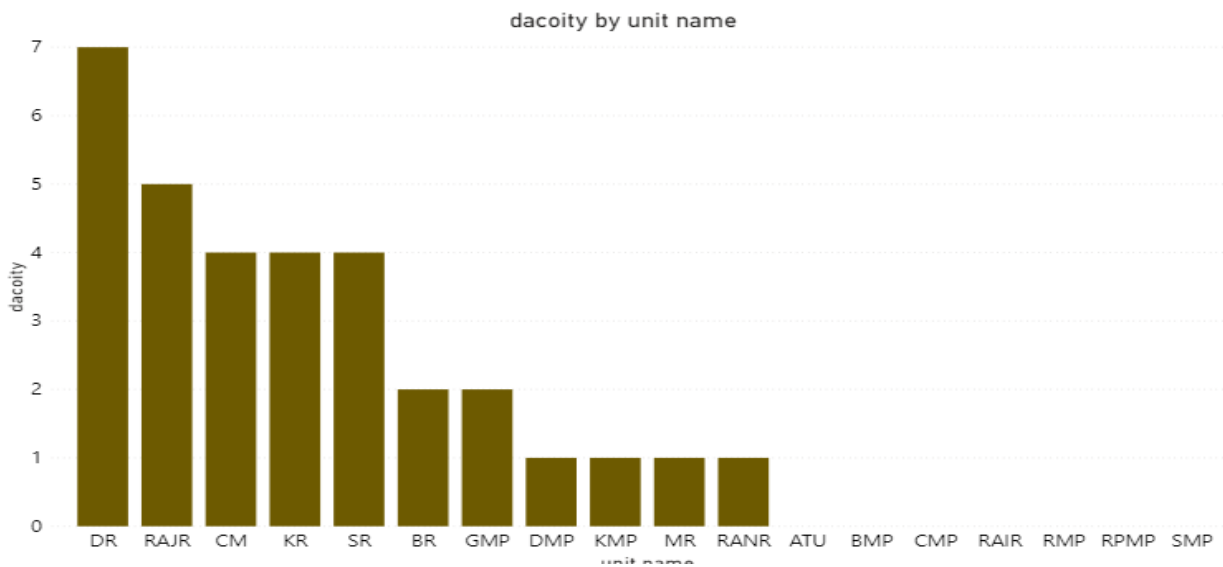


Figure-6.4.8 dacoity by unit

Violence against women murder and quick trail by month in Dhaka

2017's monthly statistical report of Dhaka metropolitan where show violence against women and murder and those crime quick trial.

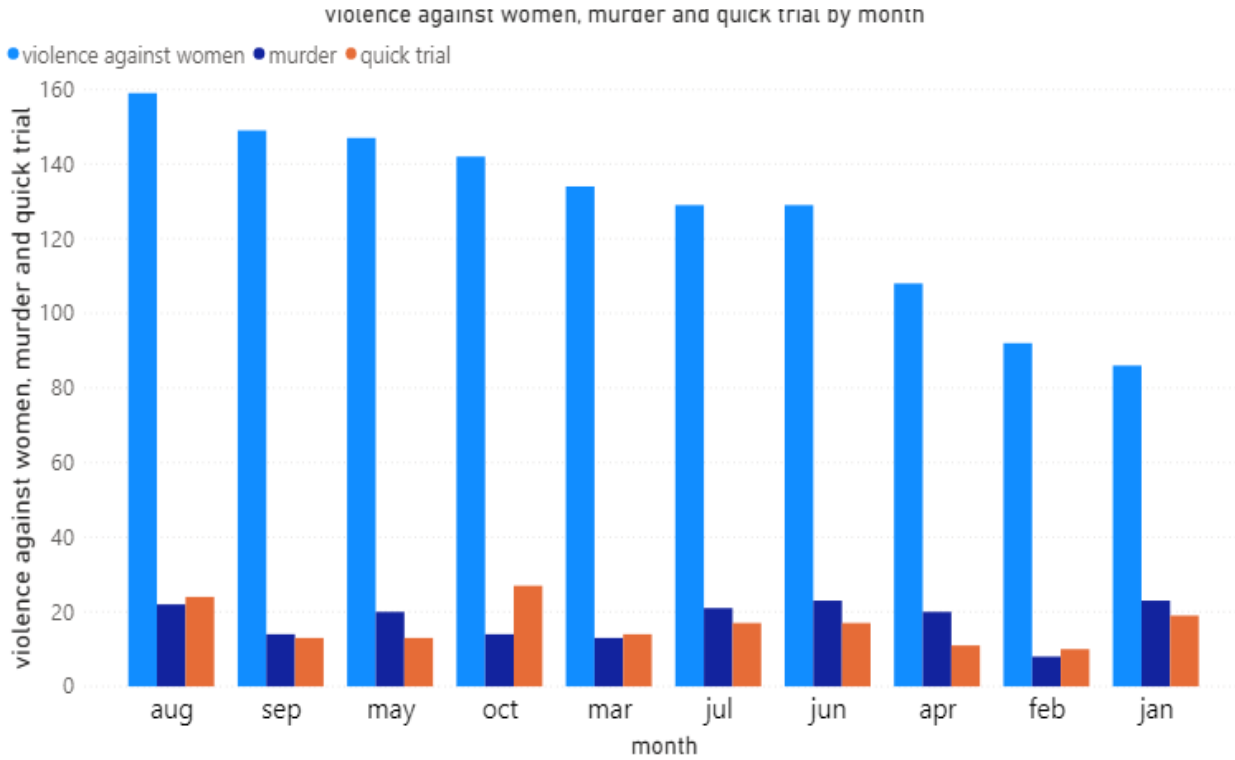


Figure-6.4.9 violence against women murder and quick trail by month in Dhaka

6.5 Summary

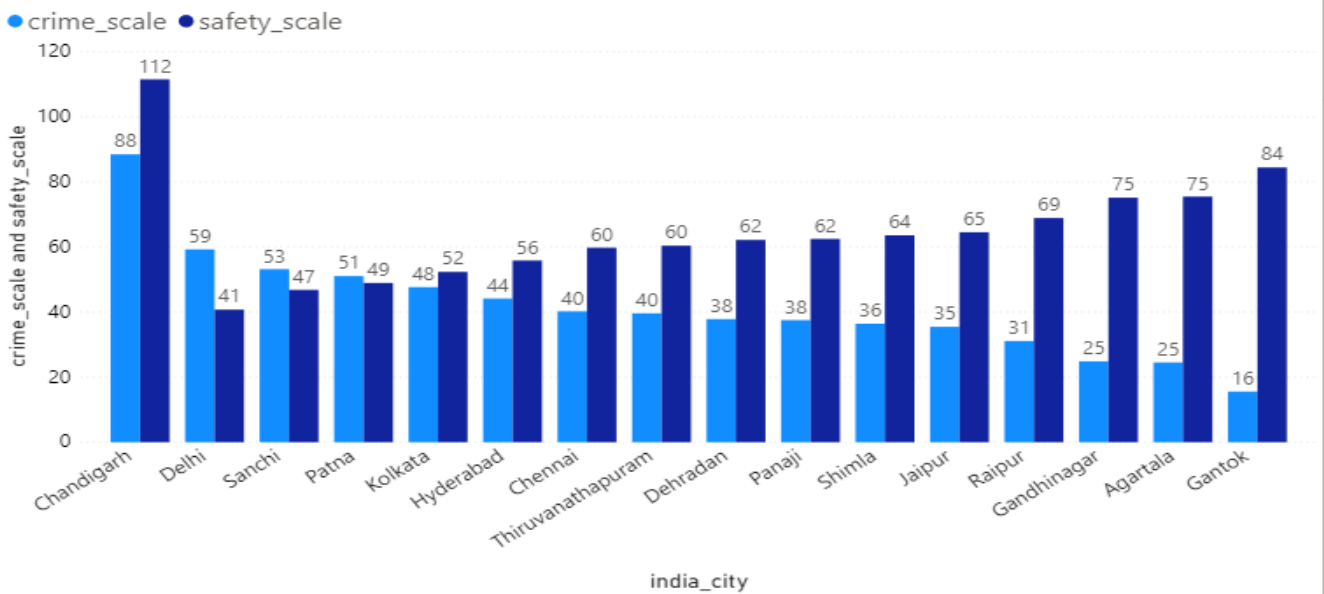
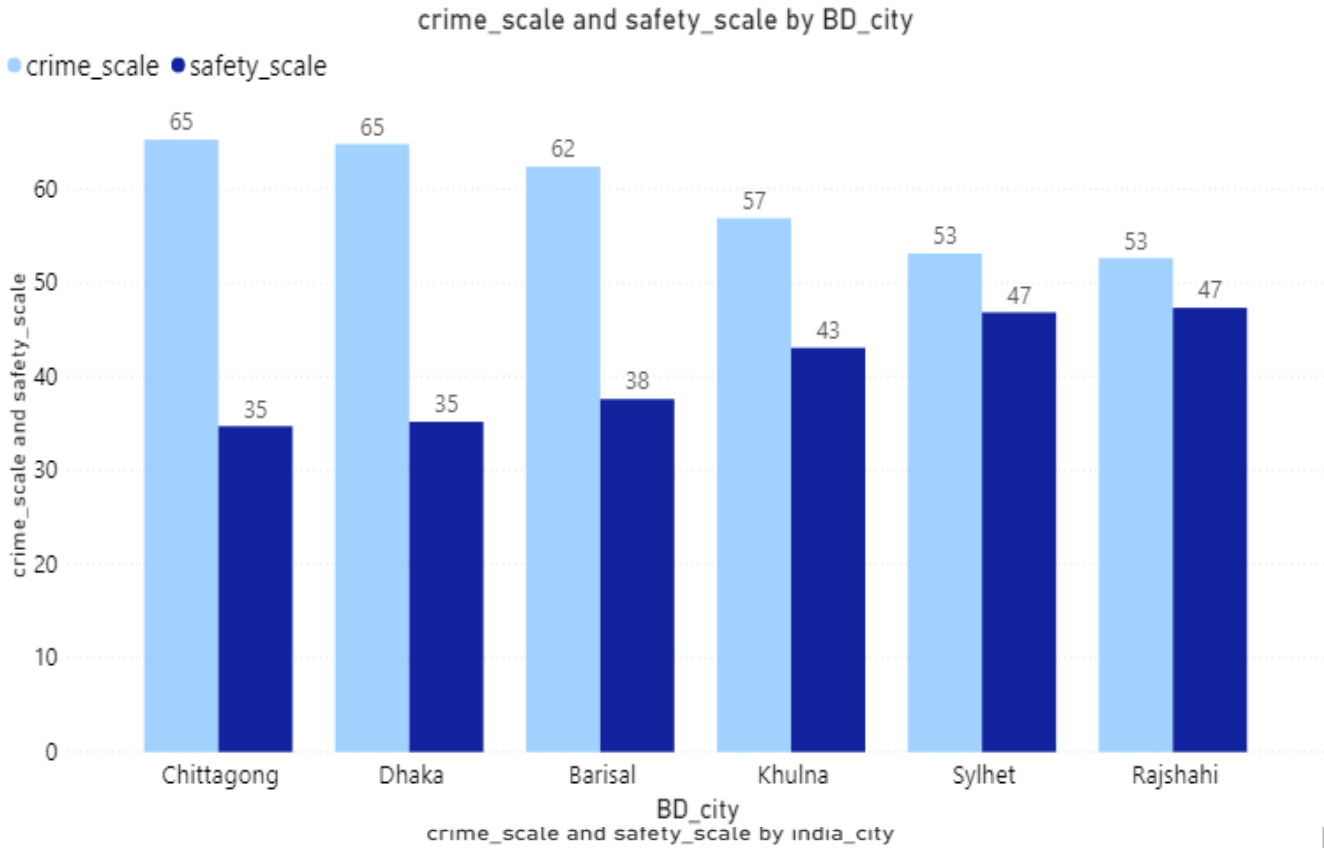
Highest crime rate in Dhaka range that is capital of Bangladesh.

Highest crime unit	Crimes
Dhaka Range	Murder, kidnapping, Police assault, woman & child repression, Dacoity, Total.
Dhaka metropolitan police	Arms act
Chittagong metropolitan	Burglary

6.6 Bangladesh crime vs Indian crime

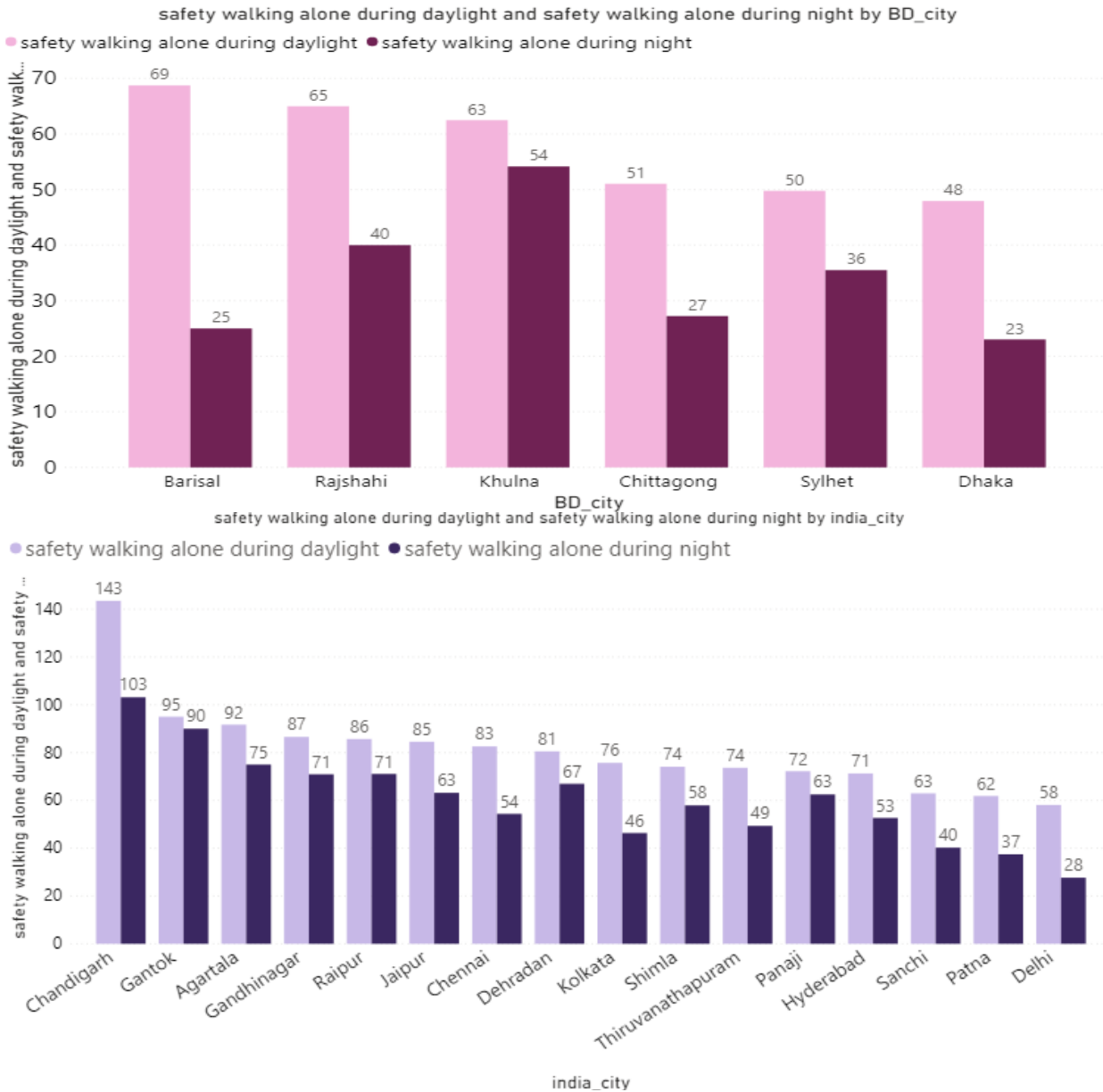
Compare Bangladeshi major city's crime & safety scale and Indian major city's crime & safety scale.

(Data source= <https://www.numbeo.com/>)



We see here Indian safety scale is better than Bangladesh.

Compare Bangladeshi major city's safety during day night and Indian major city's safety during day night scale.



Here Bangladesh safety is also lower than India

6.7 Discussion

Bangladesh India as well as geographical location. The two countries have a lot common in many ways.

Bangladesh is much smaller than India and population is much larger in India but above analysis shows that the crime rate in Bangladesh is higher than in India to reduce this rate police can follow our analysis then take action against those crime hot zone.

6.8 Limitation

Too much crime data could not be collected in Bangladesh, so a small number of data had to be analyzed.

Chapter 7

Research Methodology

7.1 Introduction

In this section our work flow of our proposed dataset in Indian cities. We are try to find the most crime zone in state wise. Our proposed method take the place, analyzing the zone, detection the more crime zone from criminal database center to identify the criminals.

7.1.1 Clustering technique

Clustering is a technique for unsupervised task and unlabeled datasets to discovering group of similarity data point's documents. We can categorized the clustering technique into two types (1) The partitioned algorithm (2) The hierarchical algorithm. K-Means algorithm also, the connection clustering they go under these two classifications. K-Means and various leveled grouping have numerous correlations.

In various leveled clustering the size of data increments as the computational sweeping, since to blend little clusters and D_D comparability grid by utilizing the specific connection capacities. By contrasting and them K-Means is quicker. It refreshes the centroid clusters with each iteration and redistributes each archive by its closest centroid by this we can say that it is an iterative algorithm.

7.1.1 K-Means Clustering

For crime analysis we proposed K-Means clustering approach for determine the crime related area. Crime dataset is an unlabeled and unsupervised so there are no dependent data. In this dataset analysis used to K-Means machine learning approach. Mainly in this dataset describe the crime area of Indian states and K-means detect the most crime area zone to prevent the crime.

7.2 Data Collection Procedure/Dataset Utilized

We are collected dataset of Indian crime data from kaggle. We collected data in total 11 years data , the data year from 2001 to 2012. Kaggle provide 30 crime datasets like murder, rape, robbery etc.

7.3 Statistical Analysis

```
df.describe()
```

	YEAR	MURDER	ATTEMPT TO MURDER	CULPABLE HOMICIDE NOT AMOUNTING TO MURDER	RAPE	CUSTODIAL RAPE	OTHER RAPE	KIDNAPPING & ABDUCTION	KIDNAPPING AND ABDUCTION OF WOMEN AND GIRLS	KIDNAPPING AND ABDUCTION OF OTHERS	...
count	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	9017.000000	...
mean	2006.629034	89.28535	78.069646	9.895531	53.041366	0.005767	53.035599	79.152046	58.535433	20.616613	...
std	3.463623	327.27503	303.446020	59.521657	190.741450	0.115223	190.725474	317.630964	246.937464	88.586415	...
min	2001.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	...
25%	2004.000000	18.000000	10.000000	0.000000	8.000000	0.000000	8.000000	10.000000	6.000000	1.000000	...
50%	2007.000000	38.000000	28.000000	2.000000	20.000000	0.000000	20.000000	25.000000	18.000000	5.000000	...
75%	2010.000000	66.000000	56.000000	6.000000	41.000000	0.000000	41.000000	56.000000	42.000000	13.000000	...
max	2012.000000	7601.000000	7964.000000	1616.000000	3425.000000	5.000000	3425.000000	8878.000000	7910.000000	2416.000000	...

8 rows x 31 columns

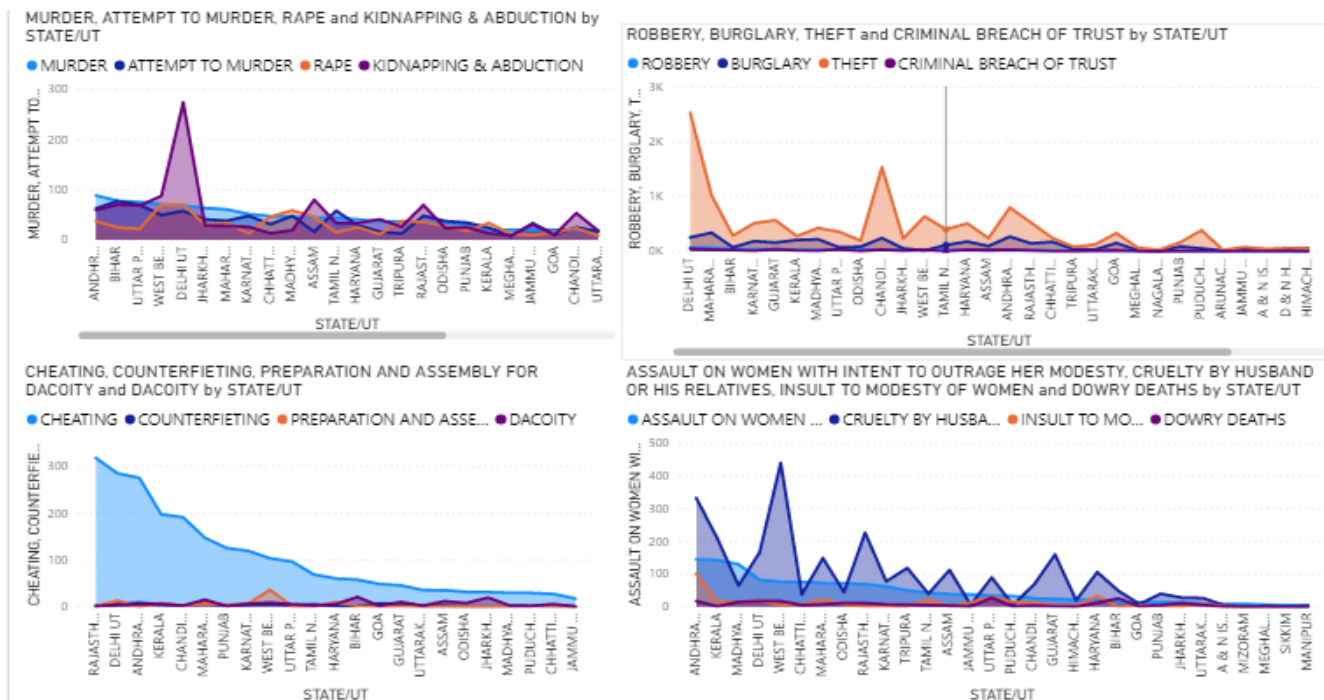


Figure-7.3 Statistical report of India

7.4 Proposed Methodology/Applied Mechanism

We are proposed a method to detect the crime zone in India. We used K-Means algorithm to determine the most crime zone area. We are taking an individual state to determine the most crime area. This analysis involves to tracking crime rate to predict the most common crime area.

7.5 Process

- 1) First of all, take the number of cluster number which is known as K.
- 2) Choose randomly the value of K.
- 3) K assign the closest cluster centroid of points.
- 4) K make a new point of cluster for each centroid.
- 5) Continually repeated 3 and 4 steps.
- 6) Iterated of the process.

7.6 Implementation Requirements

7.6.1 Tools we used:

Every development need some tools. As usual we are use some tools for developing out project. For development which tools are used in given bellow?

7.6.1.1 Jupyter Notebook IDE:

Jupyter notebook is a web application which is open source that is use to create document, live code, visualizations, share documents and narrative text. Jupyter notebook also use for data cleaning, machine learning, statistical visualization.

We are using this plat form for solving

7.6.1.2 Power BI:

Power BI is business intelligence tools for visualization. Here we use power BI for visualization after analysis.

7.6.2 Steps of Implementation:

Bellow to show the implementation process steps.

7.6.2.1 Importing Libraries:

There are some libraries which is required to solve the problem.

```

: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn
%matplotlib inline
from sklearn.cluster import KMeans
from sklearn.preprocessing import MinMaxScaler

import sklearn.cluster as cluster

```

Fig 7.6.2.1: Import Libraries

Numpy is a python library that's doing array operation of numbers. Pandas is very useful for data analysis and structure which is open source. Matplotlib is a plotting library which is mainly use for mathemethical plotting. Seaborn library highly use for data visualization. Sklearn is a machine learning library which is provide supervised and unsupervised learning algorithm. In our program Kmeans is a unsupervised algorithm so Kmeans import from sklearn.

7.6.2.2 Upload Datasets:

In out program upload out data frame in .csv format using pandas library.

```

In [6]: df=pd.read_csv('F:/Work Station/archive/crime/01_District_wise_crimes_committed_IPC_2001_2012.csv')
In [7]: df
Out[7]:

```

	STATE/UT	DISTRICT	YEAR	MURDER	ATTEMPT TO MURDER	CULPABLE HOMICIDE NOT AMOUNTING TO MURDER	RAPE	CUSTODIAL RAPE	OTHER RAPE	KIDNAPPING & ABDUCTION	...	ARSON	HURT/GREIVIOUS HURT	D
0	ANDHRA PRADESH	ADILABAD	2001	101	60	17	50	0	50	46	...	30	1131	
1	ANDHRA PRADESH	ANANTAPUR	2001	151	125	1	23	0	23	53	...	69	1543	
2	ANDHRA PRADESH	CHITTOOR	2001	101	57	2	27	0	27	59	...	38	2088	
3	ANDHRA PRADESH	CUDDAPAH	2001	80	53	1	20	0	20	25	...	23	795	
4	ANDHRA PRADESH	EAST GODAVARI	2001	82	67	1	23	0	23	49	...	41	1244	

Fig 7.6.2.2: dataset

7.6.2.3 Check null value:

In our dataset have any null value that is check by isnull function. If isnull() function provide true that means in dataset have null value otherwise there are no null value in any column.

```
In [5]: df.isnull().values.any()
```

```
Out[5]: False
```

Fig 7.6.2.3: check null value

7.6.2.4 Graph Plotting

Here we see the point of graphical crime in murder and rape. For graphical view we use scatterplot for axis wise view.

```
seaborn.scatterplot(x='RAPE',y='MURDER',hue='RAPE_clusters',data=df)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x187f0f9fec8>
```

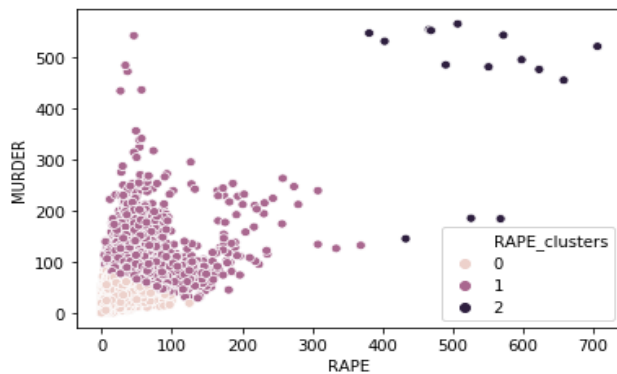


Fig7.6.2.4: plotting crime position

Here we also see the attempt to murder and murder graphical plot.

```
: seaborn.scatterplot(x='ATTEMPT TO MURDER',y='MURDER',hue='Murder_clusters',data=df)
```

```
: <matplotlib.axes._subplots.AxesSubplot at 0x1c268947a88>
```

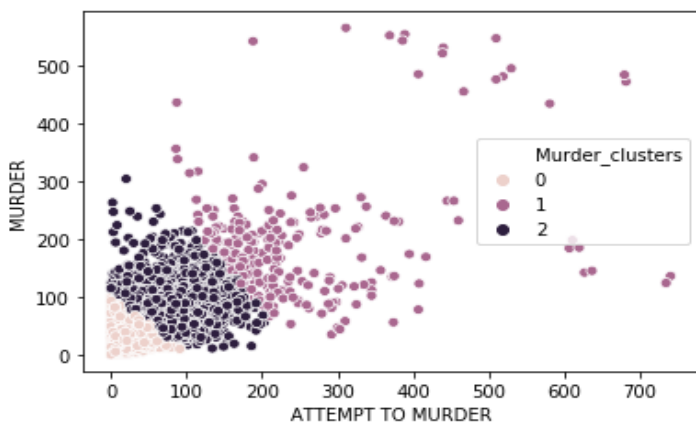


Fig7.6.2.4.1: State wise murder and attempted to murder cluster

7.6.2.5 Plotting Result

In the plotting view, normally see the axis wise view. Axis represent the X-axis and Y-axis. Here ‘Attempt to murder’ used in X-axis and ‘Murder’ column used in Y-axis.

```
plt.title('Clusters of Murder & ATTEMPT TO MURDER')
plt.scatter(df1.MURDER,df1['ATTEMPT TO MURDER'],color='green')
plt.scatter(df2.MURDER,df2['ATTEMPT TO MURDER'],color='red')
plt.scatter(df3.MURDER,df3['ATTEMPT TO MURDER'],color='black')
plt.scatter(kmeans.cluster_centers[:, 0], kmeans.cluster_centers[:, 1], s=200, c='yellow', label = 'Centroids')
plt.xlabel('ATTEMPT TO MURDER')
plt.ylabel('Murder')

plt.show()
```

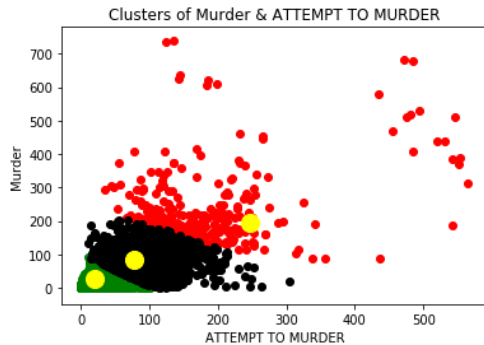


Fig 7.6.2.5: Plotting Result

7.6.2.6 Relation one crime with another

First of all there we found State wise crime zone. Every state have many type of crime. Every crime have a zone where mostly happen this crime. So using K-Means crime we can determine the most area that is describe by clustering technique. For an example, We can see the center of ‘murder’ and ‘Attempt to murder’. We can predict the most common area of murder and rape.

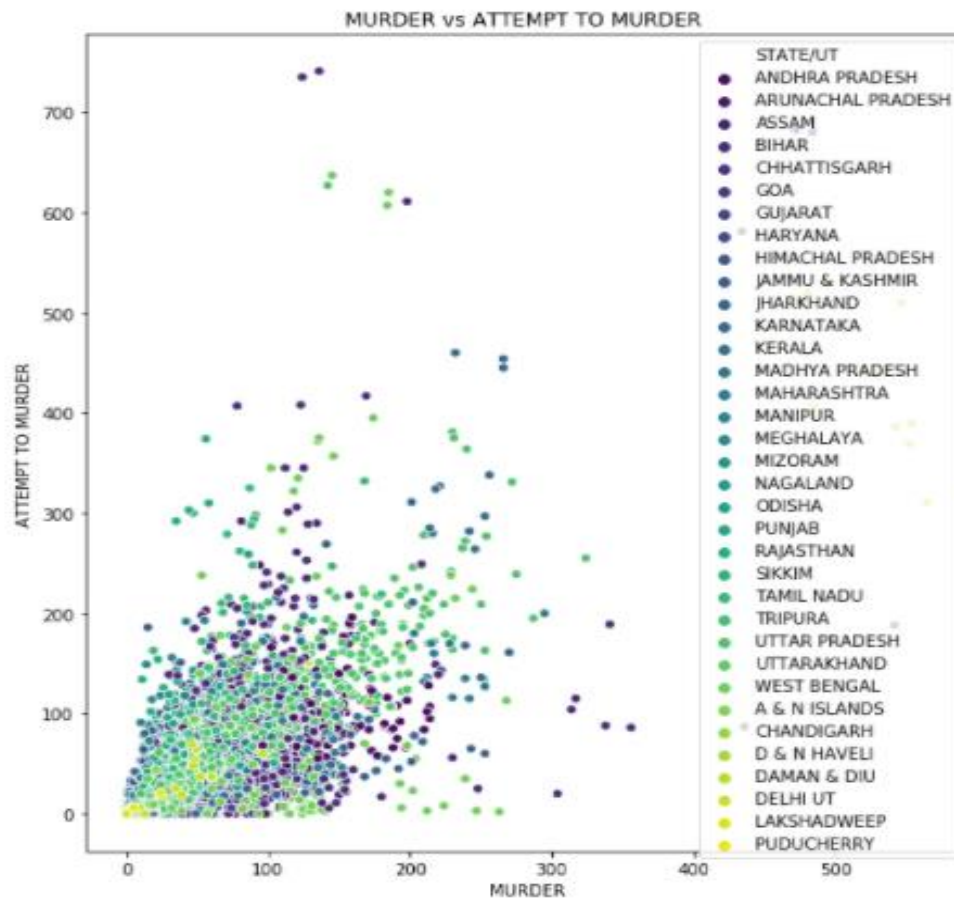


Fig 7.6.2.6: Recognize state cluster

The Yellow point is the centroid of cluster most crime zone.

```
df1=df[df.Murder_clusters==0]
df2=df[df.Murder_clusters==1]
df3=df[df.Murder_clusters==3]

plt.title('Clusters of Murder & ATTEMPT TO MURDER')

plt.scatter(df1.MURDER,df1['ATTEMPT TO MURDER'],color='green')
plt.scatter(df2.MURDER,df2['ATTEMPT TO MURDER'],color='red')
plt.scatter(df3.MURDER,df3['ATTEMPT TO MURDER'],color='black')

plt.scatter(kmeans.cluster_centers[:, 0], kmeans.cluster_centers[:, 1], s=200, c='yellow', label = 'Centroids')
plt.xlabel('ATTEMPT TO MURDER')
plt.ylabel('Murder')

plt.show()
```



Fig 7.6.2.7: Crime zone prediction

For Bangladesh crime data:

We also find out clustering in Bangladeshi police unit data set crime. Here we calculate the most crime zone. And also find the crime rate in city. Bangladesh is a small country but there are many kind of crime happen where Dacoity and Murder one of them.

Here is the import libraries for clustering.

Apply Cluster on Dacoity and Murder

```
In [7]: from sklearn.datasets.samples_generator import make_blobs
from sklearn.cluster import KMeans
import sklearn.cluster as cluster
import matplotlib.pyplot as plt

kmeans = cluster.KMeans(n_clusters=2)
kmeans = kmeans.fit(df[['dacoity','murder']])
```

```
In [8]: kmeans.cluster_centers_
```

```
Out[8]: array([[ 1.77777778, 19.5      ],
               [ 32.      , 351.     ]])
```

```
In [9]: kmeans.n_iter_
```

```
Out[9]: 2
```

```
In [10]: df['murder_clusters']=kmeans.labels_
```

```
In [11]: df['murder_clusters'].value_counts()
```

```
Out[11]: 0    18
         1     1
         Name: murder_clusters, dtype: int64
```

```
In [12]: seaborn.scatterplot(x='murder',y='dacoity',hue='murder_clusters',data=df)
```

```
Out[12]: <matplotlib.axes._subplots.AxesSubplot at 0x23b0409b508>
```

Fig 7.6.2.8: BD clustering with import lib.

For this crime, we can see the scatter plot of this crime that is the point where the crime mostly happen.

```
In [13]: f = plt.figure(figsize=(20,10))
ax = f.add_subplot(121)
seaborn.scatterplot(x='murder',y='dacoity',data=df,palette='viridis',hue='unit name',ax=ax)
ax.set_title('murder vs dacoity ')

plt.savefig('C:/Users/MSI/Desktop/Fig/murder vs dacoity.png');
```

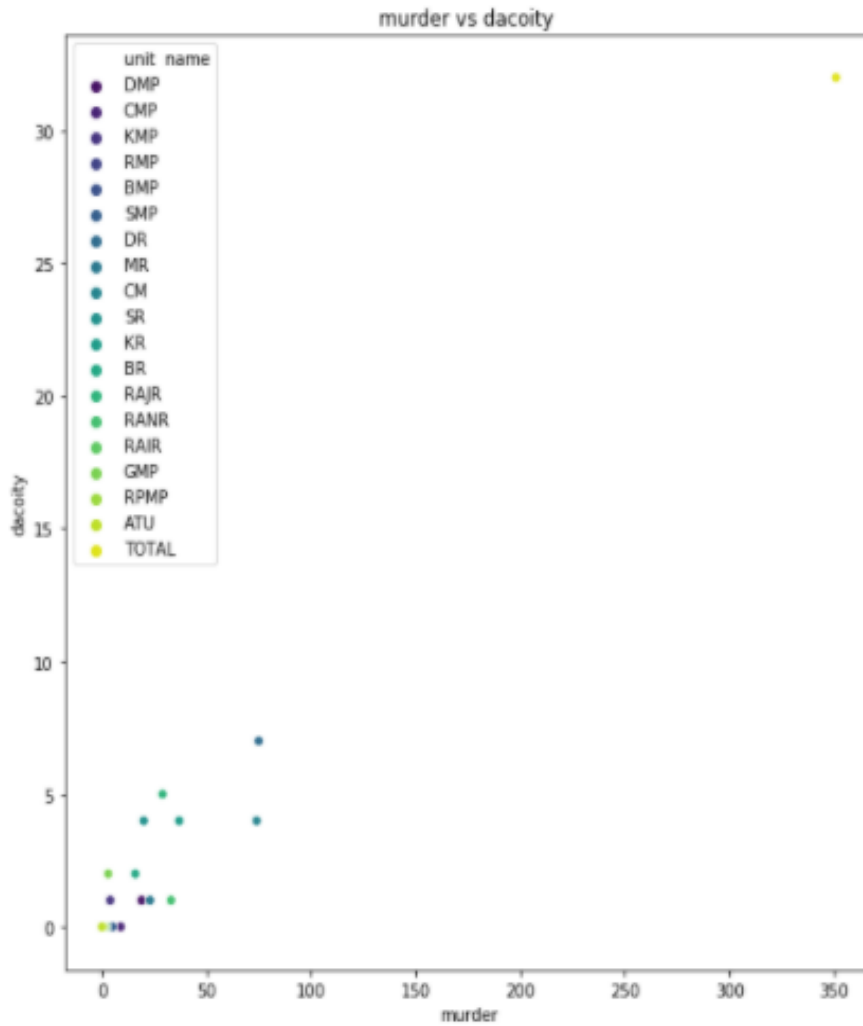


Fig 7.6.2.9: BD clustering by unit name

Here we can see the clusters point on the dacoity and murder where people and police should be aware the place.

```
In [77]: df1=df[df.murder_clusters==0]
df2=df[df.murder_clusters==1]

plt.title('Clusters of murder and dacoity')
plt.scatter(df1.murder,df1['dacoity'],color='green')
plt.scatter(df2.murder,df2['dacoity'],color='red')

plt.scatter(kmeans.cluster_centers[:, 1], kmeans.cluster_centers[:, 0], s=100, c='yellow', label = 'Centroids')
plt.xlabel('murder')
plt.ylabel('dacoity')

plt.show()
```

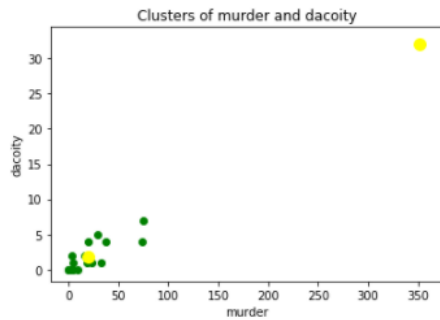


Fig 7.6.3.1: BD cluster points

7.7 RESULT AND ANALYSIS

In the following method work to predict the most crime zone in Indian state. After Clustering we get a good result of points where the crimes are mostly occurred. We have to alert and take the security in dis area. We find out the crime rate in every city both of countries in Bangladesh and India and compare the rate which country cities are safe and how is the crime scale. Our collection of data from Indian crime that is help to reduce the crime. Basically we try to find the state by state all of crime zone area not individual crime zone. K-Means cluster help to find the predictive area. So we have a proper knowledge about this crime for cluster hotspot zone. We hope the model of cluster will help us to aware our self and help to police so on. So both of countries need to aware the crimes and hotspots zone.

7.8 Future Scope

If we can provide more information about crime then we can predict crime based on the information such as victim status criminal status those age and gender and any new crime case can actually be solved matched with the old crime to solve the case according to the old crime. Comparatively, Bangladesh and India crime rate can decrease by taking proper step if we get the crime dataset of BD and India.

7.9 Conclusion

Although the crime scale of Bangladesh is higher, the scope of India crime is higher . among the major crimes in Bangladesh murder disappearance and rape are more prevalent in the Dhaka range .so if we can pull the reins of crime, then the crime scale of Bangladesh will come down . and if the social security of the people of Bangladesh increases the image of the country and economic condition of the country will expand .

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