CHAPTER - 1

INTRODUCTION

Crime pattern analysis (CPA) is the process of analytical reasoning facilitated by an understanding about the nature of an underlying spatial framework that generates crime. Now a day the number of crimes are increasing and recording within a flash of second in the world. The study of the pattern of the crime by analyzing the previous history of crime statistics will help to identify and to reduce the crime. This may help for policing and crime management.

This paper will help to understand certain crime like accidental death, NDPS ,Rape and cheating that occurred under Thrissur city police in Kerala .considerably the crime rate is increasing day by day and it is difficult to study the pattern in day to day updates. The analysis is done with the historic data that have collected by the law enforcement agencies. The pattern analysis comes apart of sociology as well as criminology.so they are having an important role in the pattern analysis it's study.

Criminology developed in the last 18th century and the criminologists have been studying the relationship between crime and place since early 19th century, after the first annual national crime statistics were published in France.Adolpe quetelet ,a Belgian mathematician, statistician and sociologist was among the first to analyze these statistics and found considerable regulatory in them(Mannheim and Bernard,2009). Similarly, France scholar Guerry(1833) and Henry Mayhew(1864) in U.K. analyzed the incidence of crime in different areas. According to Brantingham and Brantingham (2008),crime do not occur randomly or uniformly in time or space or society, across neighborhoods, or social groups, or individuals daily activities or during an individual's life time.

The crime data can be represented in certain methods like graphical method, statistical methods etc. We will get a review of the crime and it's pattern through representing them. A number of ways are there to predict the pattern of the crime like algorithm-mean algorithm, and many other software are there .SPSS is the software that we used for prediction in this paper. Only a sort of crime data is analyzing here and it will help you to understand how it works. It is only within the last few decades that the technology made spatial data mining a practical solution for wide audiences of Law enforcement officials which is affordable and available. Since the availability of criminal data or records is limited we are collecting crime data from various sources like web sites, news sites, blogs, social media, RSS feeds etc. This huge data is used as a record for creating a crime record database. So the main challenge in front of us is developing a better, efficient crime pattern detection tool to identify crime patterns effectively.

Although the term "crime analysis" has been known to law enforcement since 1963, the incorporation of crime analysis units into the mainstream of police operations is still a relatively new phenomenon. As such, compared with the functions of patrol or investigations. This is done through the collection, collation, analysis of reports, and evaluation of crime data. Crimes are random and nonrandom foreseeable and not foreseeable and take place in high crime areas as well as low crime areas. Crime analysis becomes an essential tool for short- and/or long-term planning of personnel, budgets, facilities, and equipment Crime analysis is a critical first step in

determining the need for crime/loss prevention programs as well as identifying problems on the site. Crime analysis comes into play again in the evaluation of programs.

Data mining is the process to extract information from a dataset or it is the process of discovering patterns in large data sets, it transforms a large data sets into a meaningful structure. Data mining can be said as knowledge discovery from data (KDD). It is one of the processes of conversion of raw data into understandable information and knowledge. It helps to find interesting data patterns from the large data sets.

Spatio-temporal pattern analysis is a key task in crime analysis. Spatio-temporal pattern analysis is a process that extracts information and knowledge from geo-and-time-referenced data and creates knowledge for crime analysts. The basic objective of spatial crime pattern analysis is to find spatial crime patterns and then use the patterns to help identifying the root causes of the crimes. For example, if a large number of thefts occurred in a specific area, criminologists would be interested to study the environmental settings at or close to this specific area, and then the settings could provide clues to criminologists to investigate whether or not thefts occurred more often in other areas with similar environment setting. The key assumption behind spatial crime pattern analysis is that crimes would correlate with environment settings and this assumption is supported by related theories, such as environmental criminology (Brantingham and Brantingham, 1991) and broken windows theory (Wilson and Kelling, 1982). The key concept of environmental criminology suggests that environmental factors would influence criminal activity while the broken windows theory suggests that maintaining and monitoring urban environment in a well-condition may stop further serious crime

CHAPTER - 2

LITERATURE REVIEW

2.1 A study conducted by Sergei Ananyan on CRIME PATTERN ANALYSIS THROUGH TEXT MINING the discovered result help investigators to identify the hidden pattern through automated analysis of historical police reports. He considered some cases and illustrates an overall process for implementing a text mining solution and proves the feasibility and value of performing simultaneous analyses of both text and structured data within the same software system. It helps in solving and prevent crimes, law enforcement and government organizations are seeking to expand the scope of their analysis to include unstructured text data. objective was to create an analytical solution that investigators can routinely use to identify new patterns and associations between types of incidents, locations, time and descriptive details of the incident. the analysis of structured data to help solve and prevent crimes, law enforcement and government organizations are seeking to expand the scope of their analysis to include unstructured text data

2.2 A study conducted by Malcolm timothy Gladwell(2000) on the tipping point: a tipping point perspective on BROKEN WINDOWS.in the study he details the broken window theory.it points the visible signs of crime, Anti-social behavior, civil disorder create an urban environment that encourage the future crime. The best way to reduce the crime, then is a deal with the visible signs first studies undertaken in New York and Netherlands supports the effectiveness of this approach.

2.3 A study on the topic "Crime Analysis and Prediction Using Data Mining" by Shiju Sathyadevan, Devan M.S and Surya Gangadharan. S(Amrita Center for Cyber Security,Amrita Vishwa Vidyapeetham,Amritapuri, Kerala, India)Crime analysis and prevention is a systematic approach for identifying and analyzing patterns and trends in crime. Our system can predict regions which have high probability for crime occurrence and can visualize crime prone areas. With the increasing advent of computerized systems, crime data analysts can help the Law enforcement officers to speed up the process of solving crimes. To identify a pattern, crime analysts takes a lot of time, scanning through data to find whether a particular crime fits into a known pattern. If it does not fit into an existing pattern then the data must be classified as a new pattern. After detecting a pattern, it can be used to predict, anticipate and prevent crime. Before this clustering algorithms have been used for crime analysis. most of it is manually done with the help of multiple reports that the detectives usually get from the computer data analysts and their own crime logs. The data included means of entry (front door, window, etc.), day of the week, characteristics of the property (apartment, house), and geographic proximity to other break-ins. Using nine known crime series of burglaries Series Finder recovered most of the crimes within these patterns and also identified nine additional crimes. The predicted result showed more than 80% accuracy. So the same concept we are applying here .have tested the accuracy of classification and prediction based on different test sets. Classification is

done based on the Bayes theorem which showed more than 90% accuracy. Using this algorithm we trained numerous news articles and build a model. For testing we are inputting some test data into the model which shows better results. Our system takes factors/attributes of a place and Apriori algorithm gives the frequent patterns of that place. The pattern is used for building a model for decision tree. Our software predicts crime prone regions in India on a particular day. It will be more accurate if we consider a particular state/region. Also another problem is that we are not predicting the time in which the crime is happening. Since time is an important factor in crime we have to predict not only the crime prone regions but also the proper time.

2.4 A study on" Survey on Crime Occurrence Detection and prediction Techniques" by Sruthi.s.Gosavi(Assistant professor, Tilak Maharashtra Vidyapeeth ,Pune) and Saraddha.S.Kavathekar(master in computer engineering ,PCCOE ,Pune)Due to the increasing rate of crimes there is a need of system that will detect and predict crimes at dynamic time .The aim of this survey is to study Data Mining techniques that will help to detect and predict crimes using association rule mining, k-mean clustering, decision trees & naive Bayes and Machine learning techniques such as deep neural network and artificial neural network. Findings of this survey were that when the dataset instances have more number of missing values pre- processing becomes a vital task and crime does not occur uniformly across urban landscapes but concentrates in certain areas .Crime detection is using existing data of crime scene and criminals to extract patterns. By analyzing existing data on past crime, a person can predict when and where new crimes are most likely to occur .The increasing use of computerized systems to track crimes may boost the process of detecting and predicting crimes. Crime analysis is an important aspect in data mining field as there is a huge data at present that need to be efficiently ques. Automated data collection has fostered the use of data mining for intrusion and crime detection. Indeed, banks, large corporations ,insurance companies, casinos, etc. are increasingly mining .this survey review the literatures on various techniques and applications that are applied to solve the crimes. Thus, for certain regions crime hotspots need to be predicted to identify which areas are more prone to crimes and the type of crime. This survey concludes that Crime does not occur uniformly across urban landscapes but concentrates in certain areas. The data set to be processed is huge so pre-processing and handling missing values becomes an important tasks .for predicting crime from large amount of data the artificial neural networks and deep neural networks can be used for detecting crime as well as perfecting crime using past crime data base. when data is supervised ,data mining algorithm can be preferred and when data is multi-modal, huge & unsupervised the deep learning technique scan be used.

2.5 A study conducted by Bernard E.Harcourt (2002) on can we reduce serious crime by punishing petty offences states that there is no good evidence for the theory that disorder causes crime. Public disorder may not be criminogenic. The study suggested that miner social and physical disorder is not casually related to violent crime

2.6 A study conducted by Anthony A.Braga,et.al(2015)on" CAN POLICINGDISORDER REDUCE CRIME" a systemic review and a meta-analysis, journal of Research in C rime and Delinquency states that when police address social and physical disordering neighborhoods they can prevent serious crimes and this article reports on the results of the first systemic review and meta-analysis of effect of disorder policing on crime. The result of systemic review and meta-analysis suggests that disorder policing strategies generates net worthy crime control gains. The types of strategies used by police department to control disorder seem to matter, this hold important implications for police community relations, justice and crime prevention.

2.7 A study by KELVIN LEONG AND ANNA SUNG (department of business and management, Glyndwr university, Wrexham wales, UK) work on a article a review of spatio-temporal pattern analysis approaches on crime analysis. This is to find the spatial crime pattern and then use the patterns to help identifying the root cause of the crime .spatio-temporal crime pattern analysis help to identify the spatio temporal crime pattern from a data set and forecast what would be likely happen in other situation such as in the future or other data set. The key assumption behind this spatial crime pattern analysis is that the crime would correlate with environment setting and this assumption is supported by related theories.

2.8 A study of the use of the data mining technique in crime trend analysis and offender profiling is conducted by Richard William Adderley BSc(Hons) .the aim of the project is to ascertain whether the data is existing police recording systems can be used by existing mature data mining technique in an efficient manner to achieve results that are more accurate than those achieved by police specialist when analyzing crime. The technique that used in this study where the MLP and SOM.The difficulties in identifying cross border criminality and consistency in criminal behavior are compounded by the inconsistence approach to recording crime data. The positive out come of the project and its limitations are clearly mentioned in it.

CHAPTER – 3

AIM & OBJECTIVES

3.1 **AIM**

    To study the crime pattern of specified police station under Thrissur city police in between the year 2015-2019

3.2**OBJECTIVE**

- To understand the common crimes and it's rate in specified jurisdiction.
- To understand the crime rate under each jurisdiction in different years.
- To understand the seasonal variation of crime rate.

CHAPTER - 4

METHODOLOGY

This study is based on the crime pattern analysis and its relative to policing in Thrissur city, Kerala which is done based on the collected data of crime of past five years(2015-2019). The data is shortlisted of a particular jurisdiction. Data collected is analyzed, processed and segregated as per various factors .The collected data is coded using the RAPIDMINER software.

4.1 DATA ANALYSIS

Crime pattern analysis is a analysis technique for identifying the crime pattern specified to a particular area .The study of this will help in policing for preventing the crime and reducing it. The analysis is done on the basic of historical crime statistics data that are collected. In previous years the analysis is assisted by the data from internet, website, news paper etc .Now a days we are having a number of software's and algorithms for analyzing the crime pattern.

In this project I considered only a specific type of crimes and Police Station where those crimes are recorded in an high rate under the Thrissur city police. Accidental death, cheating, NDPS and Rape are the 4 major cases that are registered in Thrissur. Studying them and their pattern will help to reduce the crime rate. Thrissur is the cultural capital of Kerala and they play an important role in the administration of the state. Considerably high crime rate in Thrissur makes importance of crime pattern analysis in Thrissur. The statistical data of crime in the year 2015 to 2019 is taken for the analysis. From those data it is clearly visible that the crime rate is increasing as well as decreasing consequently.

There are 14 police stations under Thrissur city police and the given below are the graphical representation of the yearly computed crimes in different police station in various years.
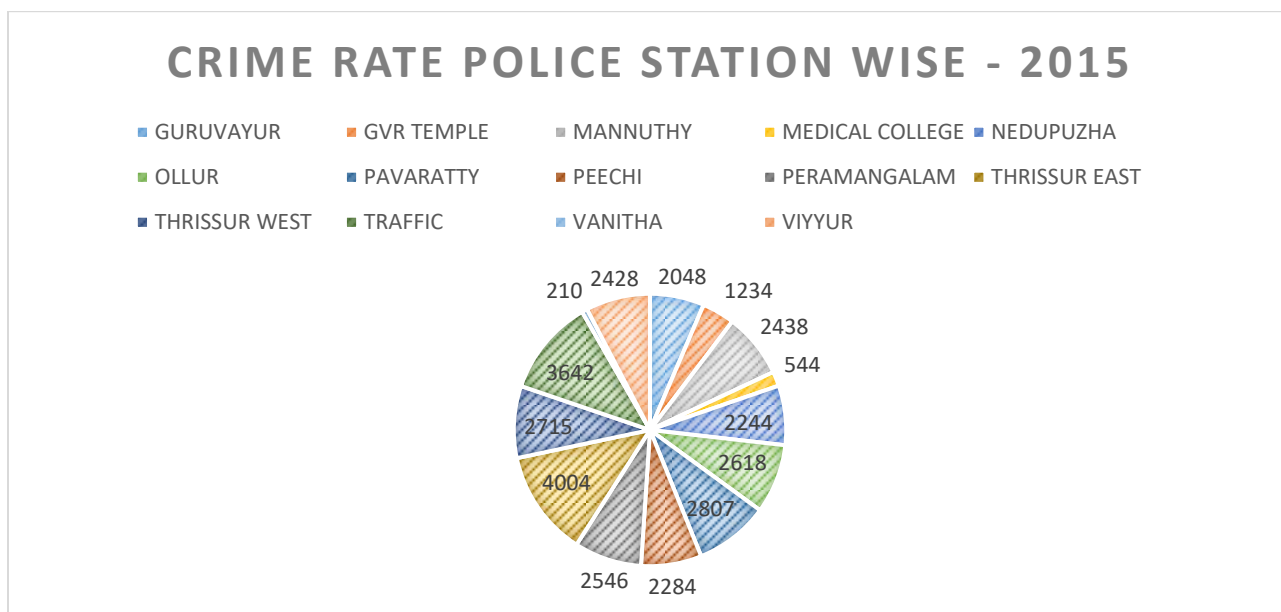
Pi chart:4.1 police station wise crime rate 2015
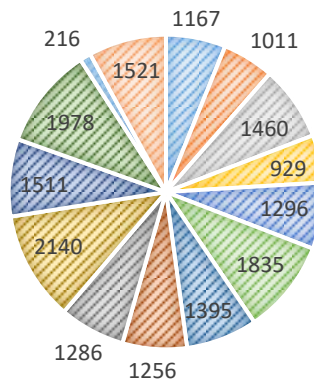
CRIME RATE POLICE STATION WISE - 2016

■ GURUVAYUR ■ GVR TEMPLE ■ MANNUTHY ■ MEDICAL COLLEGE ■ NEDUPUZHA
■ OLLUR ■ PAVARATTY ■ PEECHI ■ PERAMANGALAM ■ THRISSUR EAST
■ THRISSUR WEST ■ TRAFFIC ■ VANITHA ■ VIYYUR

235 2391 2288 1373
3250 2423
2543 2214
3740 2159
2846
2169
2113 2155
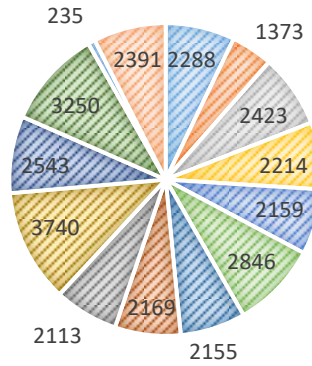
Pi chart:4.2 police station wise crime rate 2016

CRIME RATE POLICE STATION WISE - 2017

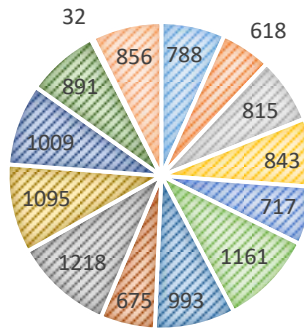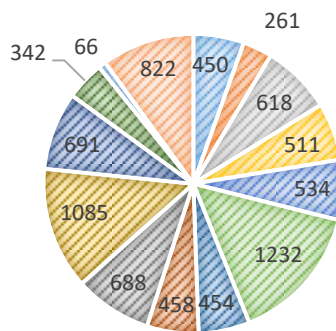■ GURUVAYUR ■ GVR TEMPLE ■ MANNUTHY ■ MEDICAL COLLEGE ■ NEDUPUZHA
■ OLLUR ■ PAVARATTY ■ PEECHI ■ PERAMANGALAM ■ THRISSUR EAST
■ THRISSUR WEST ■ TRAFFIC ■ VANITHA ■ VIYY+A2:A15UR

216 1167 1011
1521
1978 1460
929
1511
1296
2140 1835
1395
1286 1256

Pi chart:4.3 police station wise crime rate 2017

Pi chart:4.4 police station wise crime rate 2018

Pi chart:4.5 police station wise crime rate 2019

From the above pi charts it is evident that Ollur, Thrissur east, Thrissur west and Viyyur are the police stations where the number of the crimes are registered more in the years 2015 to 2019. Eventually a tabular column containing the crime rates of accidental death ,cheating, NDPS act and Rape is studied against these police stations(ie Ollur, Thrissur east ,Thrissur west ,Viyyur).

These study will help to determine a simplest pattern analysis which of these specific crimes under these police station .other than these four police station ,traffic police station is also having similar rate of crime and those are mainly petty cases like traffic violence, helmet cases and some cases related to the motor vehicle act.

So the mostly seen crimes are shortlisted for better understanding and analyzing. The crimes like ACCIDENTAL DEATH, CHEATING, NDPS ACT and RAPE are taken for the analysis.

Table: 4.1 Specified Crimes rate in2015

CRIME	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
ACCIDENTAL DEATH	16	7	13	14
CHEATING	19	62	59	8
NDPS	8	21	13	3
RAPE	6	5	6	3

Table: 4.2 Specified Crimes rate in 2016

CRIME	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
ACCIDENTAL DEATH	22	6	18	10
CHEATING	14	94	29	6
NDPS	18	14	10	7
RAPE	5	4	5	2

Table: 4.3 Specified Crimes rate in 2017

CRIME	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
ACCIDENTAL DEATH	18	12	11	13
CHEATING	18	81	52	14
NDPS	12	30	5	7
RAPE	9	8	8	14

Table: 4.4 Specified Crimes rate in 2018

CRIME	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
ACCIDENTAL DEATH	12	10	14	17
CHEATING	32	86	213	18
NDPS	4	11	12	11
RAPE	13	3	7	8

Table: 4.5 Specified Crimes rate in 2019

CRIME	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
ACCIDENTAL DEATH	6	6	4	7
CHEATING	218	110	128	73
NDPS	14	3	9	24
RAPE	10	8	8	4

The given below is the graphical representation of the crime(Accidental death ,cheating ,NDPS and rape)from the primary analysis of this graph leads to conclude the effect of crime in our society as well as the importance of the crime pattern analysis. From the four graphs it is evident that there is a rapid increase and decrease in the rate. Ollur, Thrissur east ,Thrissur west and Viyyur are the police station where these type of crimes are registered in a high rate by compared with other police stations under Thrissur city police.

By comparing the statistical data of type of crimes it is evident that cheating is the commonly seen crime and it is increasing rapidly yearly.

For better understanding and studies each of the crime is specially categorized in to bar graphs. The graphs include the individual analysis of the crime in whole five years(2015-19).it shows deep information's of the crime statistics in another dimensions
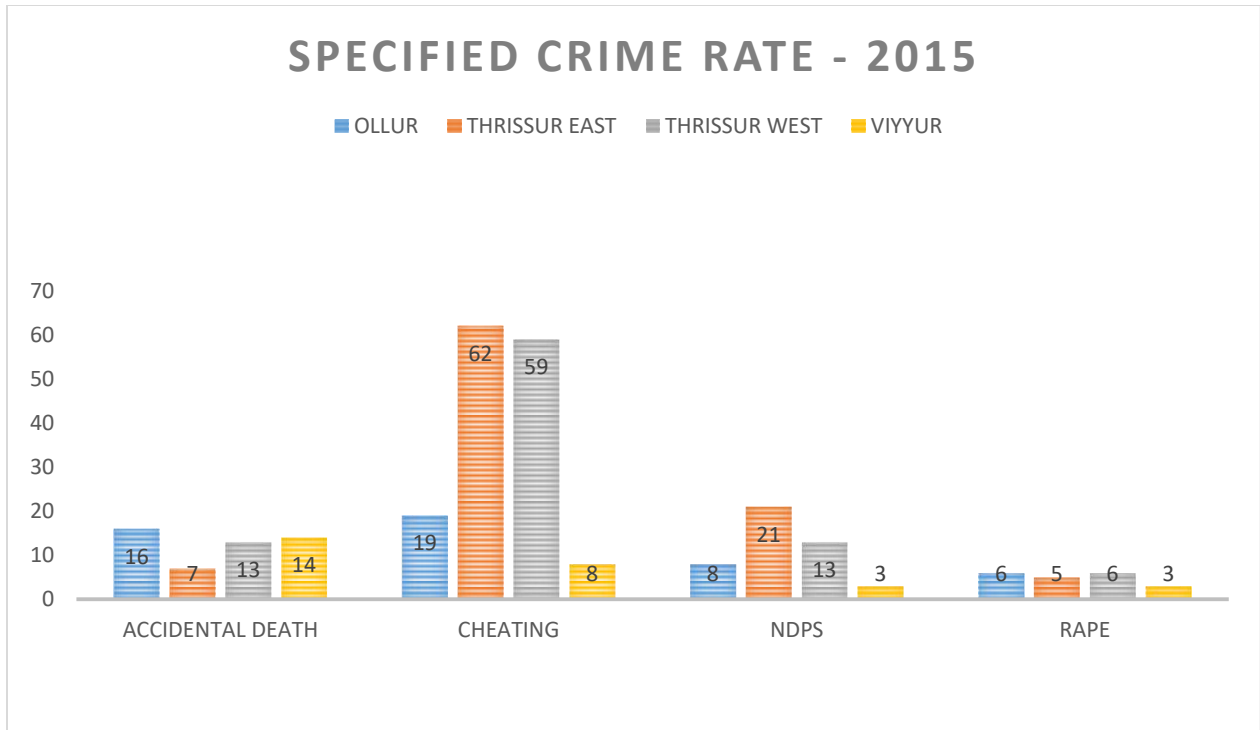
Graph 4.1 : Specified Crime Rate - 2015

Thrissur east police station and west police station is having a similar rate of cheating case registration and when it comes to Viyyur the crime rate is least while comparing to others. Thrissur east is in the first position in both cheating and NDPS cases and Viyyur is the least rated one. And in the rape case Ollur and Thrissur west is seems to be similar in crime rating.

SPECIFIED CRIME RATE -2016

ollur p.s   thrissur east   thrissur west   viyyur

Category	ollur p.s	thrissur east	thrissur west	viyyur
Accidental Death	22	6	18	10
Cheating	14	94	29	6
NDPS Act	18	14	10	7
Rape	5	4	5	2
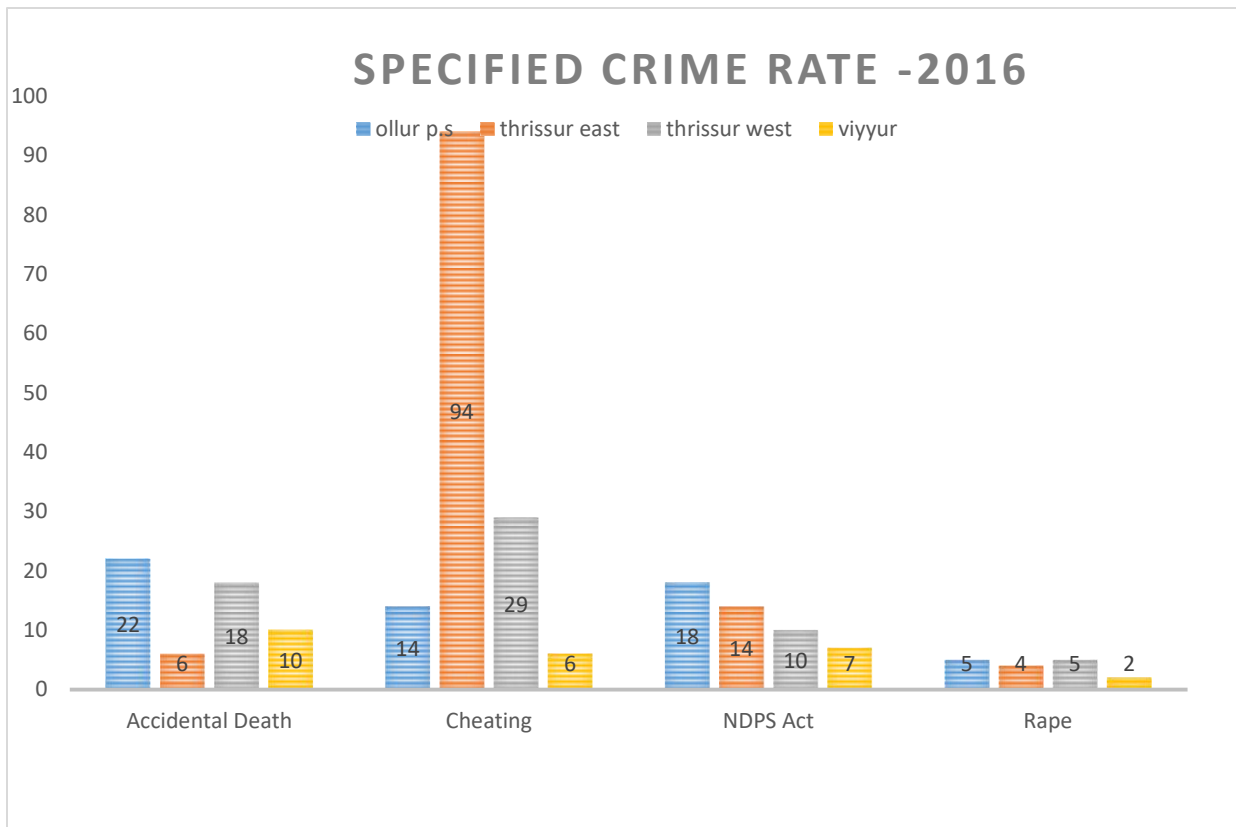
Graph 4.2 : Specified Crime Rate - 2016

Cheating is the highly seen crime in this year and the rape is the least seen one. Thrissur east police station is having highly recorded crime rate. Viyyur is having least rated crimes while comparing to the other three Ollur and Thrissur west is having a recurrent increasing and decreasing of the crime rate.

SPECIFIED CRIME RATE - 2017

ollur p.s   thrissur east   thrissur west   viyyur

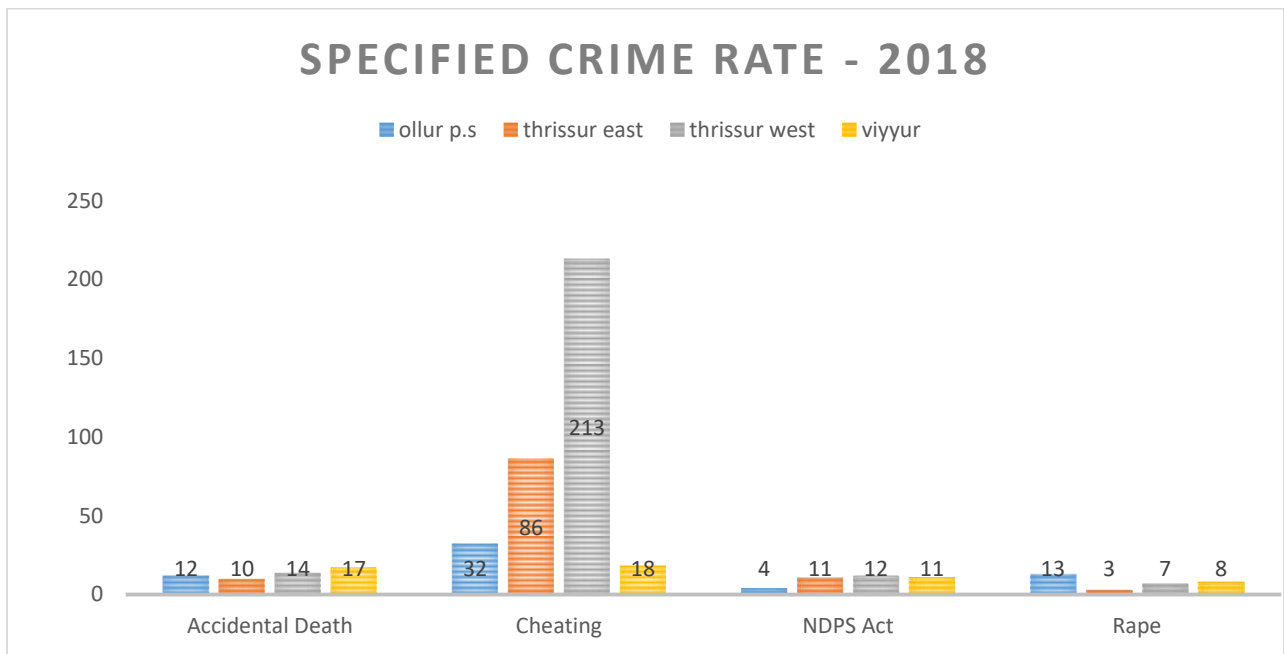|	Accidental Death	Cheating	NDPS Act	Rape
ollur p.s	18	18	12	9
thrissur east	12	81	30	8
thrissur west	11	52	5	8
viyyur	13	14	7	14
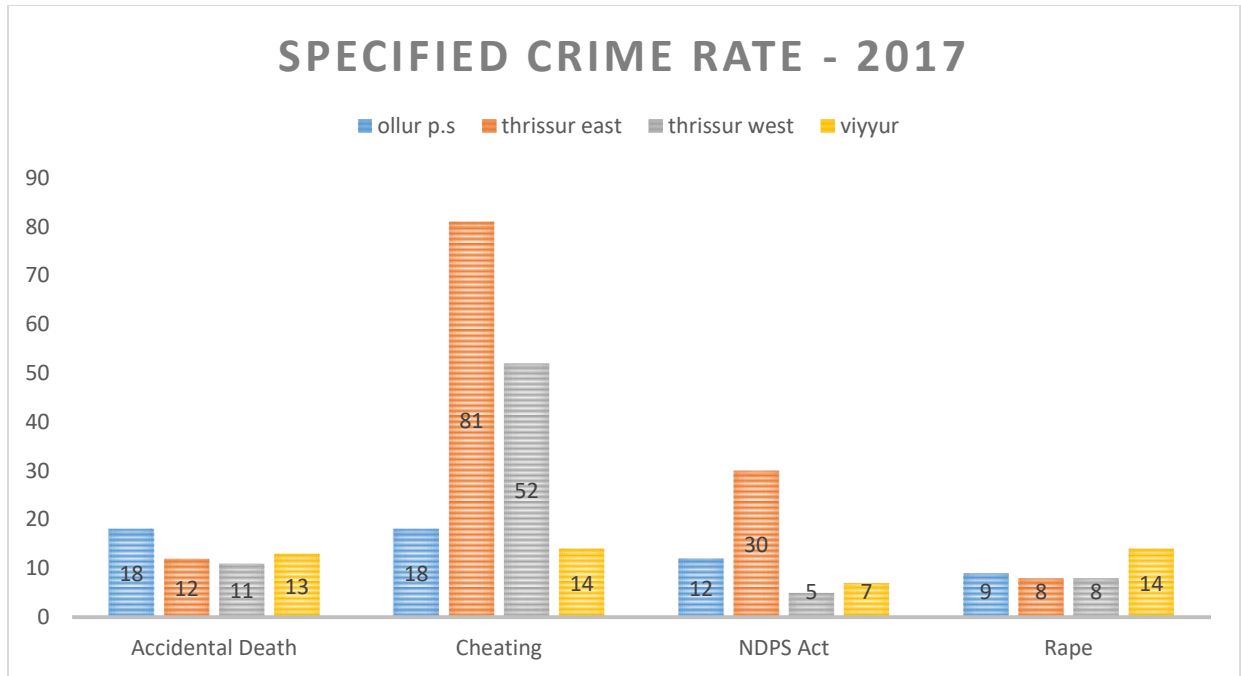
Graph 4.3: Specified Crime Rate - 2017

As like previous year Thrissur east police station is in the first place in the case registration rate that is of cheating and the Thrissur west police station is the least registered crime (NDPS).by comparing with other years the crime rate of Thrissur west is seems to be decreasing and the Viyyur ps rating is increasing.

SPECIFIED CRIME RATE - 2018

ollur p.s   thrissur east   thrissur west   viyyur

	Accidental Death	Cheating	NDPS Act	Rape
ollur p.s	12	32	4	13
thrissur east	10	86	11	3
thrissur west	14	213	12	7
viyyur	17	18	11	8

Graph 4.4 : Specified Crime Rate - 2018

Here the least registered case Is rape that is on Thrissur east police station. And the Ollur police station is having the highest rate of rape cases. When it comes to NDPS Thrissur east, west and Viyyur is having a similar rate of case and Ollur is having the least. Thrissur west police station the most rate of cheating case and the least one is Viyyur. Accidental death rate is almost similar in whole four stations.
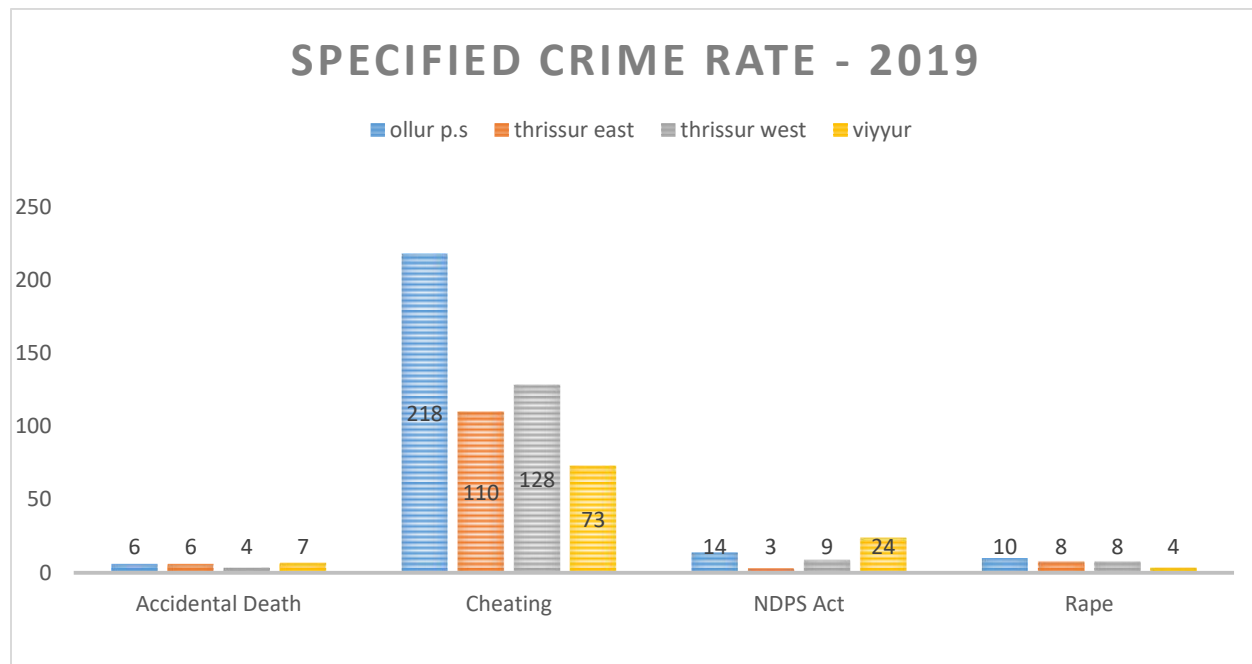
Graph 4.5 : Specified Crime Rate – 2019

From the graph we can clearly understand that the crime rate of Ollur PS is rapidly increased and it is the most crime registered police station and also we can see the rate of cheating case which is the highest of entire five years.

It is not possible to predict the crime pattern with the help of yearly data analysis. So Quarterly crime data from the year 2015to 2019 is taken and those data's are converted into quadrants consist of a sets of 3 months in a year. This classification is also called seasonal variation. With that data the analysis is carried out deeply. Almost 19 category of data's are taken. With the help of those data, graph was plotted. Quadrants are divided as per the following:

Q1 – Jan, Feb & Mar

Q2 – Apr, May & Jun

Q3 – Jul, Aug & Sept

Q4 – Oct, Nov & Dec

15
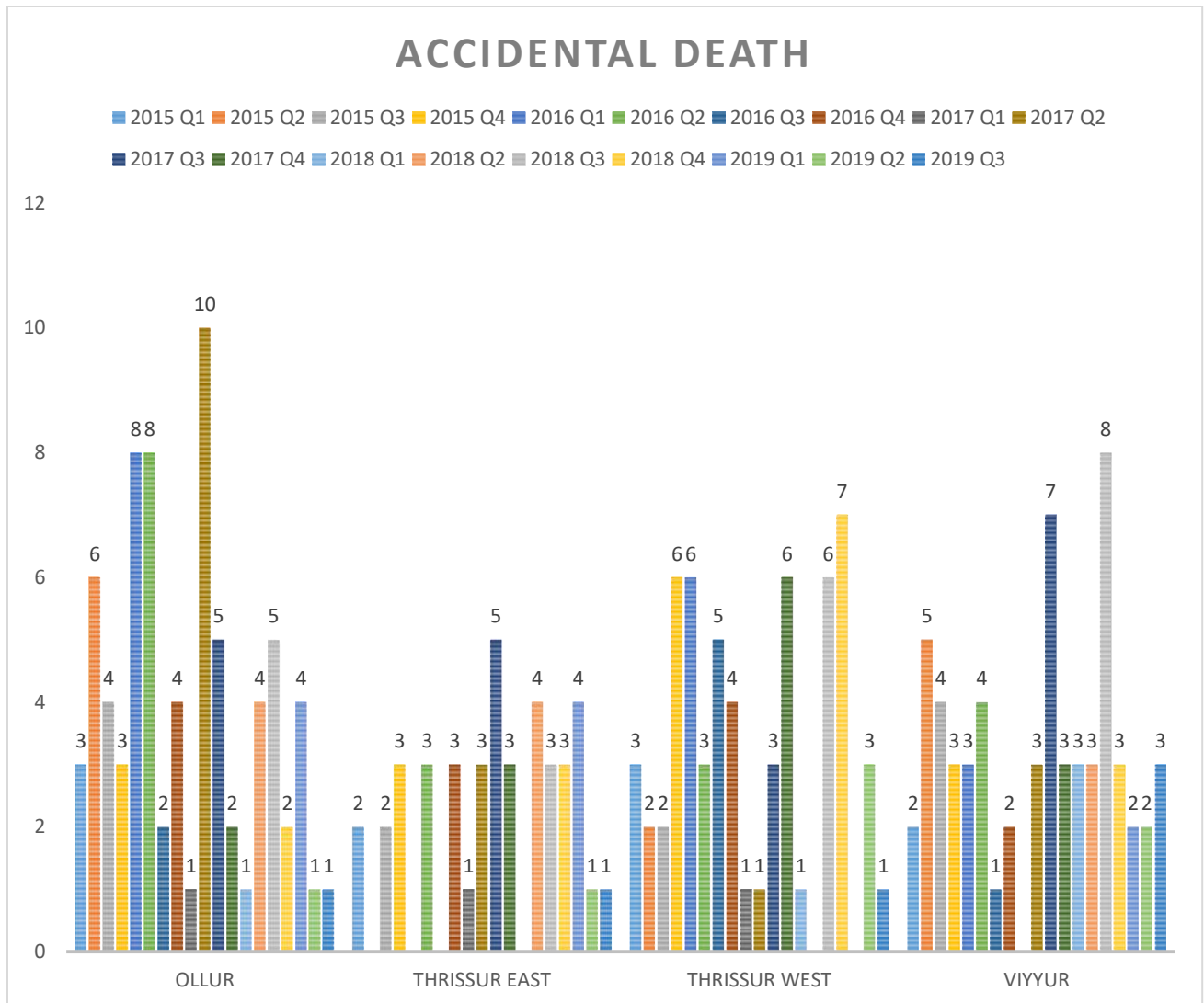
ACCIDENTAL DEATH

Graph 4.6 :Accidental death from 2015-2019

From the above graph we can see that there is a rapid increase an decrease in the crime rate from 2015 first three month to 2019 last three month. And also understood that in the beginning of every year the accidental death rate is lower while compared to the second and third. And when coming to the fourth quadrant of each year, it is similar as the first. So these accidental crimes are commonly occurring in the month from April to September .mainly the accidental death is occurring under Ollur police station
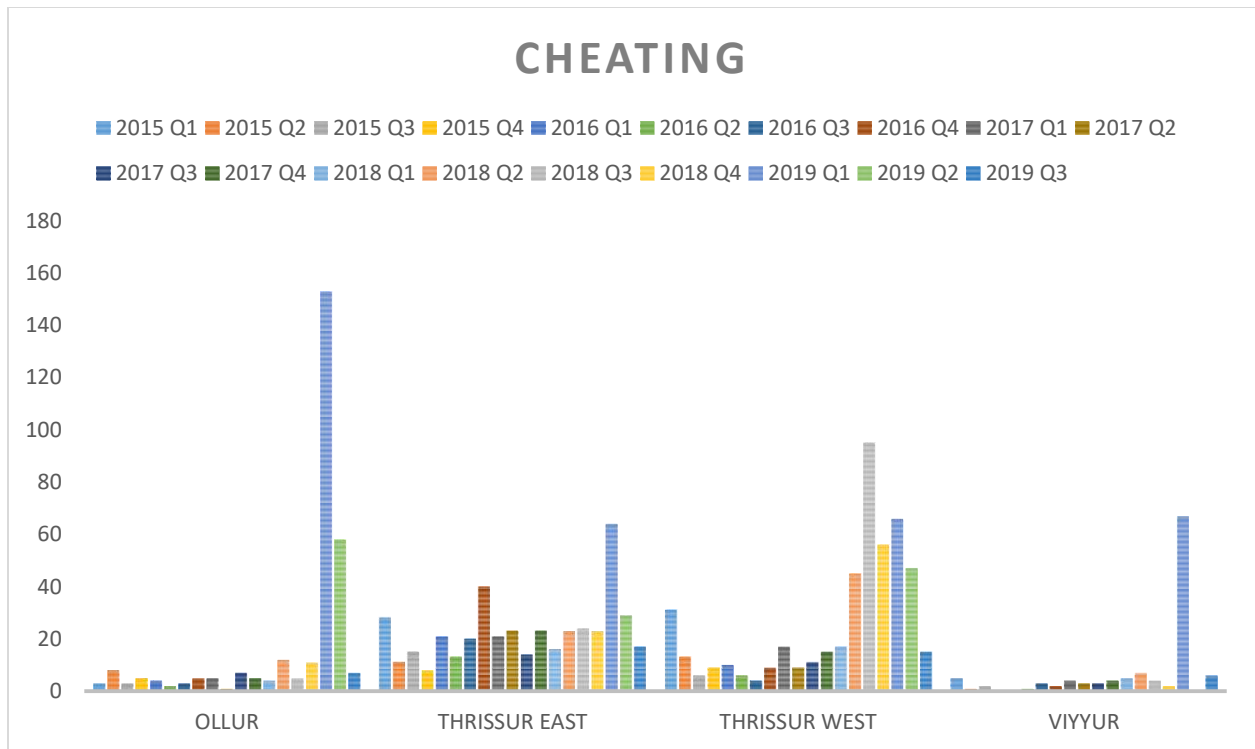
Graph 4.7 :Cheating case from 2015-2019

By studying this graph we can understand that the cheating case is specifically increasing from the quadrant 2 of 2018 and increasing rapidly. After reaching a particular point the graph is going down indicates the decrease in the crime rate. Most commonly the cheating case is seems to be high is first quadrant of 2019
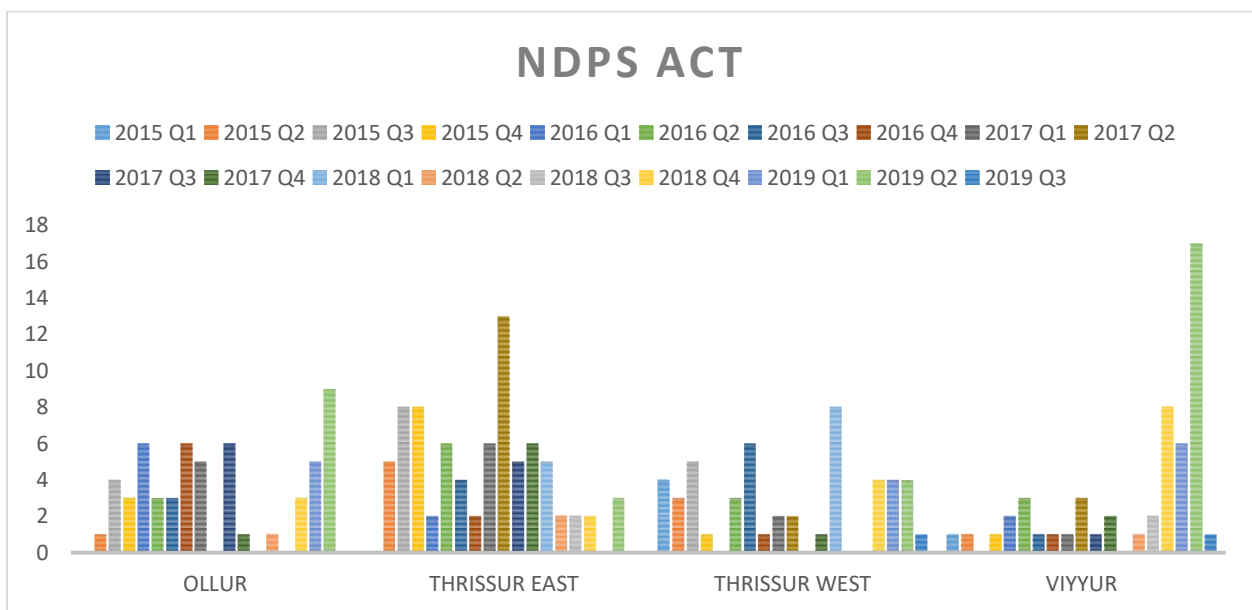
Graph 4.8 :NDPS act from 2015-2019

We can see instantaneous changes in the crime rate.

Graph 4.9 :Rape from 2015-2019

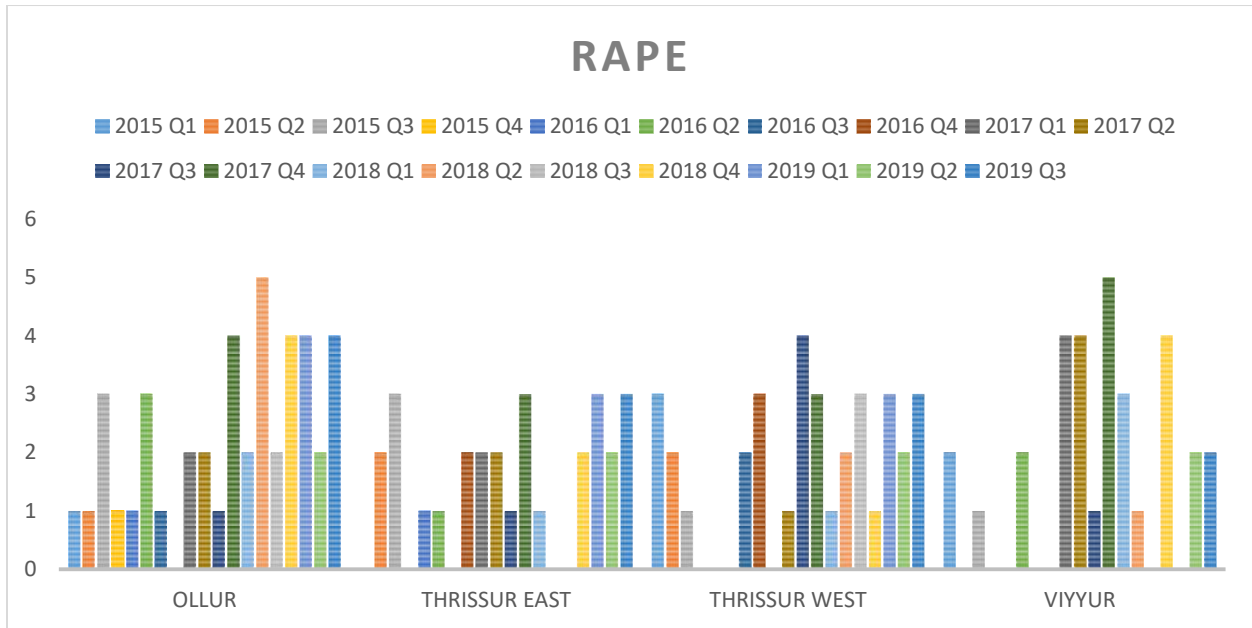   Ollur and Viyyur are village area and other two are urban . most of the rape cases are registered in these village area and less in other two stations by comparing with Thrissur east and west police station.

       From these graph we cant predict the crime pattern .the accuracy of these perdition will be less .the rate of the crime can be change instantaneously .graphical data can't help for this .It is dependable only for easily understanding of the crime pattern.

       The crime data's are analyzed using the prediction software rapidminer .It gives more accurate prediction than the graphical analysis.

       For the analysis of the data for getting accurate result ,same seasonal data is used.ie a set of 3 months in a year combined to form a season.

Table: 4.6 :quadrant wise accidental death from 2015-2019

ACCIDENTAL DEATH

SL NO	ROW LABELS	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
1	2015 Q1	3	2	3	2
2	2015 Q2	6	0	2	5
3	2015 Q3	4	2	2	4
4	2015 Q4	3	3	6	3
5	2016 Q1	8	0	6	3

6	2016 Q2	8	3	3	4
7	2016 Q3	2	0	5	1
8	2016 Q4	4	3	4	2
9	2017 Q1	1	1	1	0
10	2017 Q2	10	3	1	3
11	2017 Q3	5	5	3	7
12	2017 Q4	2	3	6	3
13	2018 Q1	1	0	1	3
14	2018 Q2	4	4	0	3
15	2018 Q3	5	3	6	8
16	2018 Q4	2	3	7	3
17	2019 Q1	4	4	0	2
18	2019 Q2	1	1	3	2
19	2019 Q3	1	1	1	3

Table: 4.7 :quadrant wise CHEATING CASE from 2015-2019

CHEATING CASE

SL NO	ROW LABELS	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
1	2015 Q1	3	28	31	5
2	2015 Q2	8	11	13	1
3	2015 Q3	3	15	6	2
4	2015 Q4	5	8	9	0
5	2016 Q1	4	21	10	0
6	2016 Q2	2	13	6	1
7	2016 Q3	3	20	4	3
8	2016 Q4	5	40	9	2
9	2017 Q1	5	21	17	4
10	2017 Q2	1	23	9	3
11	2017 Q3	7	14	11	3
12	2017 Q4	5	23	15	4
13	2018 Q1	4	16	17	5
14	2018 Q2	12	23	45	7
15	2018 Q3	5	24	95	4
16	2018 Q4	11	23	56	2
17	2019 Q1	153	64	66	67
18	2019 Q2	58	29	47	0
19	2019 Q3	7	17	15	6

Table: 4.8 :quadrant wise NDPS from 2015-2019

NDPS

SL NO	ROW LABELS	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR

1	2015 Q1	0	0	4	1
2	2015 Q2	1	5	3	1
3	2015 Q3	4	8	5	0
4	2015 Q4	3	8	1	1
5	2016 Q1	6	2	0	2
6	2016 Q2	3	6	3	3
7	2016 Q3	3	4	6	1
8	2016 Q4	6	2	1	1
9	2017 Q1	5	6	2	1
10	2017 Q2	0	13	2	3
11	2017 Q3	6	5	0	1
12	2017 Q4	1	6	1	2
13	2018 Q1	0	5	8	0
14	2018 Q2	1	2	0	1
15	2018 Q3	0	2	0	2
16	2018 Q4	3	2	4	8
17	2019 Q1	5		4	6
18	2019 Q2	9	3	4	17
19	2019 Q3	0	0	1	1

Table: 4.9 :quadrant wise RAPE from 2015-2019

RAPE

SL NO	ROW LABELS	OLLUR	THRISSUR EAST	THRISSUR WEST	VIYYUR
1	2015 Q1	1	0	3	2
2	2015 Q2	1	2	2	0
3	2015 Q3	3	3	1	1
4	2015 Q4	1	0	0	0
5	2016 Q1	1	1	0	0
6	2016 Q2	3	1	0	2
7	2016 Q3	1	0	2	0
8	2016 Q4	0	2	3	0
9	2017 Q1	2	2	0	4
10	2017 Q2	2	2	1	4
11	2017 Q3	1	1	4	1
12	2017 Q4	4	3	3	5
13	2018 Q1	2	1	1	3
14	2018 Q2	5	0	2	1
15	2018 Q3	2	0	3	0
16	2018 Q4	4	2	1	4

17	2019 Q1	4	3	3	0
18	2019 Q2	2	2	2	2
19	2019 Q3	4	3	3	2

From the above data we can predict the crime OF 2019Q3 using the software RAPIDMINER.

CHAPTER - 5

RESULT

From the above prediction the crime rate of each jurisdiction understood, and also the jurisdiction where may the crime rate of 2019Q4 is more. Along with that the most occurring crime is also predicted.

The most occurring crime is cheating case and the most crime registered police station is OLLUR.

Table: 5.1

The gross rate of crime is predicted in the below table(2019Q4)

SL NO	POLICE STATION	ACCIDENTAL DEATH	CHEATING	NDPS ACT	RAPE
1	OLLUR	+12.983	+44.149	+18.928	+13.904
2	THRISSUR EAST	+18.192	+35.031	+15.217	+15.644
3	THRISSUR WEST	+12.015	+39.884	+15.446	+14.625
4	VIYYUR	+17.246	+17.142	+15.616	+15.009

CONCLUSION

The analysis shows the crime rate variation and the crime rate of specially selected police station under Thrissur city jurisdiction .From the study it is evident that most of the crimes are occurred in urban areas(Thrissur east P.S and Thrissur west P.S) in different years. The crime rate is increasing day by day .It can be reduce by using the patterns analysis of crime and place. From the seasonal studies of the crime came to know that the most crimes are occurred in mid years ,ie from April to November and least crimes are registered in the beginning months and end months of the year.

The discovered results help investigators identify hidden patterns through the automated analysis of historical police reports.

Till date, this knowledge was largely dependent on local expertise (so called 'local veterans'). Moreover, the new approach to the analysis delivers a much more comprehensive and objective overall picture of the incidents as it involves evaluating both structured and textual portions of the database.

Law enforcement agencies and government organizations can benefit from this combination of text mining and pattern analysis technologies by achieving:

• Improved crime resolution rate
• Optimal resource allocation based on dynamically changing patterns
• Faster and more up to date results from raw data
• Reduced officer training time and costs
• Better crime prediction and prevention of offences.

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