PREDICTIONS FOR EARTHQUAKE ANALYSIS USING DATA CLASSIFICATION

A PROJECT REPORT

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BONAFIDE CERTIFICATE

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DECLARATION

We**, R. SNEHA** (20202303) and **R.J. SUDHAN** (20202304) and **K.VINOTHINI** (20202307), hereby declare that the project report titled "**PREDICTIONS FOR EARTHQUAKE ANALYSIS USING DATA CLASSIFICATION**" done by us under the guidance of **Dr.M.MUTHUSAMY.M.E,PH.D**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology in Information Technology. Certified further that, to the best of our knowledge, the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

As In this project, To clear up this problem, Machine learning is outlined because the massive assortment of datasets that is advanced to method. The organization face difficulties to frame control and deal with the huge information Earthquake data sets. On the premise of job sort, wind data set and disk performance, kaggle data set is the fastest growing source of energy all around the world Earthquakes were once thought to result from supernatural forces in the analysis . Even though condition monitoring systems have a huge impact in optimizing data set farms performance via fault anticipation, As we know that the destruction caused by earthquakes is massive and causes loss of lives every year. There are several ways Geologist use to predict earthquakes. The results so far have been successful in telling where an earthquake has more probability to occur but when it will happen is still under research. This application will ask the user to enter the range of latitude and longitude for the region where they want to know if earthquake can occur. Based on these co-ordinates it will use the data set and apply Regression algorithms to make the prediction. The mean square error is also calculated so we can find which algorithm gives accurate results. Intermediate files square measure created from energy efficiently square measure written to native disk and output files square measure written to distributed classification system of This work proposes a methodology to evaluate the performance of operating wind farms via the use of Supervisory Control and Data Acquisition System (SCADA). Programming completely different of various} jobs to different disks is known once finishing map reduce tasks.

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LIST OF ABBREVIATION

S.NO	ABBREVIATION	EXPANSION
1	SVM	Support Vector Machine
2	AES	Advanced Encryption Standard
3	LSB	Least Significant Bit
4	MLSB	Modified Least Significant Bit
5	HVS	Human Virtual System
6	RDBMS	Relational Database Management System

CHAPTER 1

INTRODUCTION

1.1 ABOUT THE PROJECT

Earthquake is a natural calamity that has been causing loss of lives and property for several years. The earthquakes cause the shaking of the surface resulting in lo of damage. Also they can occur at any time so it is very difficult to take preventive measures. The after effects of the earthquake are also very disastrous. It takes several months and years to recover from the damage done by the earthquake. It totally destroys everything if the magnitude of earthquake is very high and can completely ruin a city. There have been several methods that have been used to predict earthquakes but none have been precise and accurate.

Machine learning is important because it gives enterprises a view of trends in customer behavior and business operational patterns, as well as supports the development of new products. Many of today's leading companies, such as Facebook, Google and Umber, make machine learning a central part of their operations. Machine learning has become a significant competitive differentiator for many companies. Classical machine learning is often categorized by how an algorithm learns to become more accurate in its predictions. There are four basic approaches: supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning. The type of algorithm data scientists choose to use depends on what type of data they want to predict.

Earthquake forecast for Indian subcontinent along with rest of the World requires employing their earthquake catalogue aka data-set.

A earthquake catalogue refers to a complete list of earthquake location, time, magnitude and depth that have happened in the past. Methodology relies on sequence of these past earthquakes, recognizing suitable, necessary and appropriate parameters, identifying patterns in these parameters and understanding correlations between actual earthquakes from the past so as to predict future occurrence.

Machine learning introduce us to the idea that a strong earthquake is followed by aftershocks. We can detect location of these aftershocks by analysis of arrival time of

P-waves and S-waves. Data collection from 16 earthquake stations in SAC file format, which contains time series data and is a waveform, used by authors to study trends in P- wave and S-wave. Data is clipped followed by noise removal to only obtain needed waveform by means of triggering algorithm and filters. In this type of **machine learning**, data scientists supply algorithms with labeled training data and define the variables they want the algorithm to assess for correlations. Both the input and the output of the algorithm is specified.

Unsupervised learning: This type of machine learning involves algorithms that train on unlabeled data. The algorithm scans through data sets looking for any meaningful connection. The data that algorithms train on as well as the predictions or recommendations they output are predetermined.

Semi-supervised learning: This approach to machine learning involves a mix of the two preceding types. Data scientists may feed an algorithm mostly labeled training data, but the model is free to explore the data on its own and develop its own understanding of the data set.

1.2 EARTHQUAKE PREDICTION OVERVIEW

A In addition to that, Earthquake Prediction's dominance in market capitalization over the Earthquake Prediction data set market has gradually faded from 85% in 2010 to 50% today, showing that an overall attraction to the Earthquake Prediction has taken place in the last couple of years.

Lately, as Earthquake Prediction spirals to new lows every day in the year 2018, while dragging the entire Earthquake Prediction data set market down with it, market participants are becoming increasingly interested in the factors that lead to such downturns to understand the price dynamics of these digital Earthquake Prediction. However, from the perspective of a Earthquake Prediction data set trader, whether the prices going up or down is no problem as long as the direction is predictable. In the chase of an expected boom period, investors can take a long position in Earthquake Prediction beforehand to realize their returns once the prices reach up to a certain level. Whereas in the case of a bust period foreseen in the future, investors can short sell these Earthquake Prediction through margin trading (allowed by many Earthquake Prediction data set exchanges) to gain excess returns. Moreover, taking long or short positions has become much easier after the action taken by the CBOE in December 2017 when they introduced Earthquake Prediction futures. Such a financial asset provides investors to speculate on Earthquake Prediction prices in both directions through leverage without even holding Earthquake Predictions. Similar strategies can be implemented lately for other Earthquake Prediction through binary options traded in the offshore exchanges.

1.3 GOAL OF THE PROJECTS

The purpose Earthquake prediction research has been conducted for over 100 years with no obvious successes. Claims of breakthroughs have failed to withstand scrutiny. Extensive searches have failed to find reliable precursors. Theoretical work suggests that faulting is a non-linear process which is highly sensitive to unmeasurably fine details of the state of the Earth in a large volume, not just in the immediate vicinity of the hypo centre. Any small earthquake thus has some probability of cascading into a large event. Reliable issuing of alarms of imminent large earthquakes appears to be effectively impossible.

In scheduling technique , **An Earth quake Detection dataset** is a collection of data within a database.

Typically, datasets take on a tabular format consisting of rows and columns. Each column represents a specific variable, while each row corresponds to a specific value. Some datasets consisting of unstructured data are non-tabular, meaning they don't fit the traditional row-column format.

Data analysis refers to the process of manipulating raw data to uncover useful insights and draw conclusions. During this process, a data analyst or data scientist will organize, transform, and model a dataset.

Organizations use data to solve business problems, make informed decisions, and effectively plan for the future. Data analysis ensures that this data is optimized and ready to use.

Natural occurrence that is caused by changes in the underground structures of Earth. An earthquake is the trembling or shaking movement of the Earth's surface, which occurs naturally or artificially. Artificial earthquakes occur due to the passing of a heavy vehicle over the road or an underground chemical or nuclear explosion.

An earthquake is one of the most massive natural disasters which happens unexpectedly shaking the earth's surface. Due to earthquakes, not only infrastructure but also buildings get damaged thereby affecting lifestyle. For the early-stage prediction of the earthquake impact, machine learning can play a vital role, and this entails the novelty of the work. For this perception, six different machine learning classifiers namely Artificial Neural Network, Random Tree.

The multiplicity of predictions turns from an obstacle to a favorable base to choose the best decision. Below we investigate two models of loss functions. The first model is important for most practical prediction algorithms; it is useful in the research stage of prediction (we are now just in this stage). The second model roughly simulates prediction economics. In both cases we find the structure of predictions

CHAPTER 2

LITERATURSURVEY

[2.1] Fuzzy Logic Based Algorithm For Contex Awareness In IoT F Smart HomeEnvironment

A Since 2009, the Earthquake Prediction open-source software project has established a commanding presence in the digital data set space as a self-organizing, distributed system. The project stems from a long history of efforts to harness decentralization and progressive Earthquake Prediction graphy for social good, as espoused by the ethos of the Cypherpunks mailing list on which Earthquake Prediction was first released. However, certain design choices in Earthquake Prediction's core protocol have led to consolidation of the peer-to-peer nodes, rather than greater diversification, thus threatening system integrity. In this position paper, we explore the socio-technical limits that challenge Earthquake Prediction's ability to remain fully decentralized and "self-contained" as an algorithmically governed system. The need to integrate into existing human systems and infrastructures complicates the project's original vision. We propose hardware, software and electricity management modifications to the broader Earthquake Prediction ecosystem, recognizing the need for socio-inspired design strategies to revive network integrity. We then use Earthquake Prediction as an example to discuss the fundamental limitations of "pure decentralization" and algorithmic self-governance.

Disadvantages:

- The Earthquake Prediction's ability to remain fully decentralized
- Less distributed system

[2.2] TIPPERS : A Privacy Cognizant IoTEnvironment.

Over the past few years, with the advent of block chain technology, there has been a massive increase in the usage of Earthquake Prediction Prediction. However, Earthquake Prediction Prediction are not seen as an investment opportunity due to the market's erratic behavior and high price volatility. Most of the solutions reported in the literature for price forecasting of Earthquake Prediction Prediction may not be applicable for real-time price prediction due to their deterministic nature. Motivated by the aforementioned issues, we propose a stochastic neural network model for Earthquake Prediction data set price prediction. The proposed approach is based on the random walk theory, which is widely used in financial optimal strategy for modeling stock prices. The proposed model induces layer-wise randomness into the observed feature activations of neural networks to simulate market volatility. Moreover, a technique to learn the pattern of the reaction of the market is also included in the prediction model. We trained the Multi-Layer Perceptron (MLP) and Long Short-Term Memory (LSTM) models for Earthquake Prediction, Ethereum, and Litecoin. The results show that the proposed model is superior in comparison to the deterministic models.

Disadvantages:

- The Multi-Layer Perceptron (MLP)
- Un stochastic neural network model

[2.3] Towards Improving Privacy Control ForSmart Homes : A Privacy Decision Framework

An We show that the level of market-efficiency in the five largest Earthquake Prediction is highly time-varying. Specifically, before 2017, Earthquake Prediction data set-optimal strategy are mostly inefficient. This corroborates recent results on the matter. However, the Earthquake Prediction data set-optimal strategy become more efficient over time in the period 2017–2019. This contradicts other, more recent, results on the matter.

One reason is that we apply a longer sample than previous studies. Another important reason is that we apply a robust measure of efficiency, being directly able to determine if the efficiency is significant or not. On average, Lite coin is the most efficient Earthquake Prediction data set, and Ripple being the least efficient Earthquake Prediction data set.

Disadvantages:

- This Earthquake Prediction data set-optimal strategy consisting level of less monitoring

[2.4] Homomorphic Consortium Blockchain For Smart Home System Sensitive Data PrivacyPreserving

In a paper that was anonymously published and signed by the pseudonym Satoshi Nakamoto, Earthquake Prediction was introduced to the world. Due to its enormous success, a great number of Earthquake Prediction were created in the upcoming years. This exponential growth relies mostly on the extreme volatility of the market, which led many people to become interested and get involved, primarily for profit. Earthquake Prediction data set enthusiasts tend to share and learn news and opinions on social media platforms, one of the most popular being Twitter. In this paper, we study the extent to which Twitter sentiment analysis can be used to predict price fluctuations for Earthquake Prediction. Initially, we gathered tweets and price data of seven of the most popular Earthquake Prediction, which were processed to perform sentiment analysis using Valence Aware Dictionary for Sentiment Reasoning (VADER). The time-series stationary was determined with Augmented Dicky Fuller (ADF) Kwiatkowski Phillips Schmidt Shin (KPSS) tests and then Granger Causality testing took place. While price fluctuations seem to cause sentiment for Earthquake Prediction, Cardano, XRP and Doge, predictability was found for Ethereum and Polkadot, based on a bullishness ratio. Finally, predictability of price returns is examined with Vector Auto regression (VAR) and highly accurate forecasts for two of the seven Earthquake Prediction were achieved. More specifically, price forecasts of Ethereum's and Polkadot's prices reached 99.67% and 99.17% accuracy, respectively.

Disadvantages:

- sentiment analysis can be used to predict price fluctuations for Earthquake Prediction.
- highly accurate forecasts for two of the seven Earthquake Prediction

[2.5] Coverless Information Hiding Based OnRobust Image Hashing

The main purpose of this overview is to describe the recent 3D face recognition algorithms. Earthquake Prediction is one of the most successful Earthquake Prediction , and research on Bit coin price prediction is getting more and more attention. Previous studies have used traditional statistical methods and machine learning models to predict. However, previous studies also have many problems, such as too few influencing factors, lack of model optimization, and poor prediction effect. This paper selects 27 factors related to Bit coin price changes and screens the features through the XGBoost algorithm and the Random Forest algorithm (RF). In this study, combined forecasting models based on Support Vector Regression (SVR), Least Squares Support Vector Regression (LSSVR) and Twin Support Vector Regression (TWSVR) are used to predict Earthquake Prediction price, separately. In addition, the Whale Optimization Algorithm (WOA) and Particle Swarm Optimization (PSO) are applied for parameter tuning of the models. Expected Variance Score (EVS), Coefficient of Determination (R2), Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and Mean Absolute Percentage Error (MAPE) are used to measure the prediction accuracy of the combined models. The CPU time is used to measure the operation speed of the combined models. The experimental results show that the combined model XGBoost-WOA-TWSVR has the best prediction effect, and the EVS score of this model is 0.9547. In addition, our research verifies that Twin Support Vector Regression has advantages in both prediction effect and computational speed..

Disadvantages:

- Twin Support Vector Regression (TWSVR)
- No Proper Mean Absolute Error (MAE).

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

As with Existing, Earthquake Prediction data set, along with its relevance, has been analysis in the recent years. Many organizations throughout the world have acknowledged the importance of adapting to this technology to avail the various numerical benefits virtually, with rapid advances seen in this direction. neural network modelling from natural language processing to critical time series prediction problems in computational abnormal time precious Earthquake Prediction data set is a challenging problem with non-stationary market price and volatility clustering.

To measure earthquakes can be done by using machine learning algorithms. is to try to find a way to fit a model to data and try produce low bias and variance in prediction. Big data technologies does data analysis on historical data to find out the pattern of how the earthquakes are occurring

DISADVANTAGES

- ✓ hybrid approach is evaluated using simulated and Earthquake Prediction data set data through numerical experiments.
- ✓ Not Proper Security Predictions level analysis .
- ✓ It Less interaction of the prediction accuracy.

3.2 PROPOSED SYSTEM

Optimization measures are suggested in order to enhance the performance Classification is computed from a simple majority Earth quake Detection and prediction data set of the Random forest algorithm of each point. This algorithm is simple to implement, robust to noisy training data, and effective if training data is large.to comparably used for linear regressions algorithm.

To improve SVM is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset in Earth quake Detection and prediction data set.

There should be some actual values in the feature variable of the dataset so that the classifier can predict accurate results rather than a guessed result.

Autoregressive Integrative Moving Average (ARIMA) and LSTM model in estimating the future value of Earthquake Prediction data set by analyzing the price time series over a period of 3 years. On one hand, the factual studies show that the conduct of the time series is nearly unchanged, this simple scheme is efficient in sub-periods for the most part when it is used for short-term prediction, the further investigation in Earthquake Prediction data set prediction of the price using an ARIMA model which has been trained over the whole dataset, as well as a limited part of the history of the Earthquake Prediction data set price, with the input of length being w. The interaction of the prediction accuracy and choice of window size is well highlighted in the work..

Gradient Boosting Algorithm

Gradient boosting is a method standing out for its prediction speed and accuracy, particularly with large and complex datasets. From Kaggle competitions to machine learning solutions for business, this algorithm has produced the best results. We already know that errors play a major role in any machine learning algorithm. There are mainly two types of error, bias error and variance error. Gradient boost algorithm helps us minimize bias error of the model.

Gradient boosting algorithm Before getting into the details of this algorithm we must have some knowledge about Ada Boost Algorithm which is again a boosting method.

This algorithm starts by building a decision stump and then assigning equal weights to all the data points. Then it increases the weights for all the points which are misclassified and lowers the weight for those that are easy to classify or are correctly classified. A new decision stump is made for these weighted data points. The idea behind this is to improve the predictions made by the first stump.

Predictions Model Architecture

An predictive modeling techniques in data science. It covers everything from the introduction to various predictive modeling techniques to their real-world applications detector is designed to create features from input images and then feed these features through a prediction system to draw boxes around objects and predict their classes.

The Earthquake dataset Predictive modelling is the machine learning technique that would work best for analysis that wants to predict the future outcomes for its business growth Statistical Models.

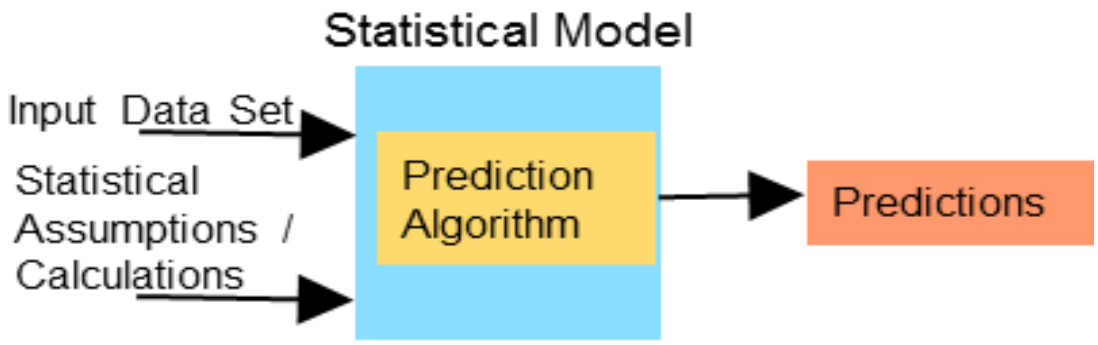

Figure 1 Statistical Objections Perditions .

As shown in Figure 1 the Predictions Modelconsists of Many Ways.

Model Clustering: Splitting the dataset into groups based on similarity.

Anomaly detection: Identifying unusual data points in a data set.

Association mining: Identifying sets of items in a data set that frequently occur together.

Dimensionality reduction: Reducing the number of variables in a data set.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS

- CPU type : Intel Pentium 4
- Clock speed : 3.0 GHz
- Ram size : 512 MB
- Hard disk capacity : 40 GB
- Monitor type : 15 Inch color monitor

4.2 SOFTWARE REQUIREMENTS

- Operating System : Windows 10
- Language : PYTHON
- IDE : PYTHON IDEL

4.3 SOFTWARE DESCRIPTION

FRONT END SOFTWARE

PYTHON Overview

INTRODUCTION

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms. The Python interpreter and the extensive standard library are freely available in source or binary form for all major platforms from the Python Web site, https://www.python.org/, and may be freely distributed.

The same site also contains distributions of and pointers to many free third party Python modules, programs and tools, and additional documentation. The Python interpreter is easily extended with new functions and data types implemented in C or C++ (or other languages callable from C). Python is also suitable as an extension language for customizable applications. This tutorial introduces the reader informally to the basic concepts and features of the Python language and system. It helps to have a Python interpreter handy for hands-on experience, but all examples are self-contained, so the tutorial can be read off-line as well. For a description of standard objects and modules, see library-index. Reference-index gives a more formal definition of the language. To write extensions in C or C++, read extending-index and c-api-index. There are also several books covering Python in depth. This tutorial does not attempt to be comprehensive and cover every single feature, or even every commonly used feature. Instead, it introduces many of Python's most noteworthy features, and will give you a good idea of the language's flavor and style. After reading it, you will be able to read and write Python modules and programs, and you will be ready to learn more about the various Python library modules described in library-index.

If you do much work on computers, eventually you find that there's some task you'd like to automate. For example, you may wish to perform a search-and-replace over a large number of text files, or rename and rearrange a bunch of photo files in a complicated way. Perhaps you'd like to write a small custom database, or a specialized GUI application, or a simple game. If you're a professional software developer, you may have to work with several C/C++/Java libraries but find the usual write/compile/test/re-compile cycle is too slow. Perhaps you're writing a test suite for such a library and find writing the testing code a tedious task.

RDBMS Terminology

Before we proceed to explain the MySQL database system, let us revise a few definitions related to the database.

•Database − A database is a collection of tables, with related data.

•Table − A table is a matrix with data. A table in a database looks like a simple spreadsheet.

•Column − One column (data element) contains data of one and the same kind, for example the column postcode.

•Row − A row (= tuple, entry or record) is a group of related data, for example the data of one subscription.

•Redundancy − Storing data twice, redundantly to make the system faster.

•Primary Key − A primary key is unique. A key value cannot occur twice in one table. With a key, you can only find one row.

•Foreign Key − A foreign key is the linking pin between two tables.

•Compound Key − A compound key (composite key) is a key that consists of multiple columns, because one column is not sufficiently unique.

•Index − An index in a database resembles an index at the back of a book.

•Referential Integrity − Referential Integrity makes sure that a foreign key value always points to an existing row.

MySQL Database

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. MySQL is becoming so popular because of many good reasons −

•MySQL is released under an open-source license. So you have nothing to pay to use it.

•MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages.

•MySQL uses a standard form of the well-known SQL data language.

•MySQL works on many operating systems and with many languages including PHP, PERL, C, C++, JAVA, etc.

•MySQL works very quickly and works well even with large data sets.

•MySQL is very friendly to PHP, the most appreciated language for web development.

•MySQL supports large databases, up to 50 million rows or more in a table. The default file size limit for a table is 4GB, but you can increase this (if your operating system can handle it) to a theoretical limit of 8 million terabytes (TB).

•MySQL is customizable. The open-source GPL license allows programmers to modify the MySQL software to fit their own specific environments.

Features

As of April 2009, MySQL offered MySQL 5.1 in two different variants: the open source MySQL Community Server and the commercial Enterprise Server. MySQL 5.5 is offered under the same licences. They have a common code base and include the following features:

•A broad subset of ANSI SQL 99, as well as extensions

•Cross-platform support

•Stored procedures

•Triggers

•Cursors

•Updatable Views

•Information schema

•Strict mode (ensures MySQL does not truncate or otherwise modify data to conform to an underlying data type, when an incompatible value is inserted into that type)

•X/Open XAdistributed transaction processing (DTP) support; two phase commit as part of this, using Oracle's InnoDB engine

•Independent storage engines (MyISAM for read speed, InnoDB for transactions and referential integrity, MySQL Archive for storing historical data in little space)

•Transactions with the InnoDB, and Cluster storage engines; savepoints with InnoDB

•SSL support

•Query caching

•Sub-SELECTs (i.e. nested SELECTs)

•Replication support (i.e. Master-Master Replication & Master-Slave Replication) with one master per slave, many slaves per master, no automatic support for multiple masters per slave.

•Full-text indexing and searching using MyISAM engine

•Embedded database library

•Unicode support (however prior to 5.5.3 UTF-8 and UCS-2 encoded strings are limited to the BMP, in 5.5.3 and later use utf8mb4 for full unicode support)

•ACID compliance when using transaction capable storage engines (InnoDB and Cluster)

•Partititoned tables with pruning of partitions in optimiser

•Shared-nothing clustering through MySQL Cluster

•Hot backup (via mysqlhotcopy) under certain conditions

•Multiple storage engines, allowing one to choose the one that is most effective for each table in the application (in MySQL 5.0, storage engines must be compiled in; in MySQL 5.1, storage engines can be dynamically loaded at run time):

•Native storage engines (MyISAM, Falcon, Merge, Memory (heap), Federated, Archive, CSV, Blackhole, Cluster, EXAMPLE, Maria, and InnoDB, which was made the default as of 5.5)

Partner-developed storage engines (solidDB, NitroEDB, ScaleDB, TokuDB, Infobright (formerly Brighthouse), Kickfire, XtraDB, IBM DB2). InnoDB used to be a partner-developed storage engine, but with recent acquisitions, Oracle now owns both MySQL core and InnoDB.

HTML Vector Routing (AODV), Temporally Ordered Routing Algorithm (TORA)

CHAPTER 5

SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE

System architecture involves the high level structure of software system abstraction, by using decomposition and composition, with architectural style and quality attributes. A software architecture design must conform to the major functionality and performance requirements of the system, as well as satisfy the non-functional requirements such as reliability, scalability, portability, and availability. Software architecture must describe its group of components, their connections, interactions among them and deployment configuration of all components. An implementation plan is a written document that outlines a team's steps to accomplish a goal or project. The main stages in the implementation are as follows:

- Including Data Collection,
- Data Preparation,
- Data Classification,
- Model Building

During the first step, As machine learning continues to increase in importance to business operations and AI becomes more practical in enterprise settings, the machine learning platform wars will only intensify.

PREDICTIONS Algorithm:

- 1. Input data-set and load libraries.
- 2. Data Pre-processing.
- 3. Model Building.
- 4. Making Predictions.

Thus they present a new seismic detector entitled to SVM classifier and its application is in a continuous manner on such stations. They compare specificity and recall measures obtained for each station, and conclude that the SVM classifier could differentiate between noise and seismic events successfully. Next, they shift their focus in reducing detection time in Early Warning System. Obtained results (88 and 110 sec) are too huge to be considered for deployment, so a new approach is inherited of overlapping windows and as a result, time obtained was 1.3 sec and 1.8 sec respectively. On the other hand, a change in values of recall and specificity, result in increase in correct detection and in false alarms

1 . SYSTEM ARCHITECTURE

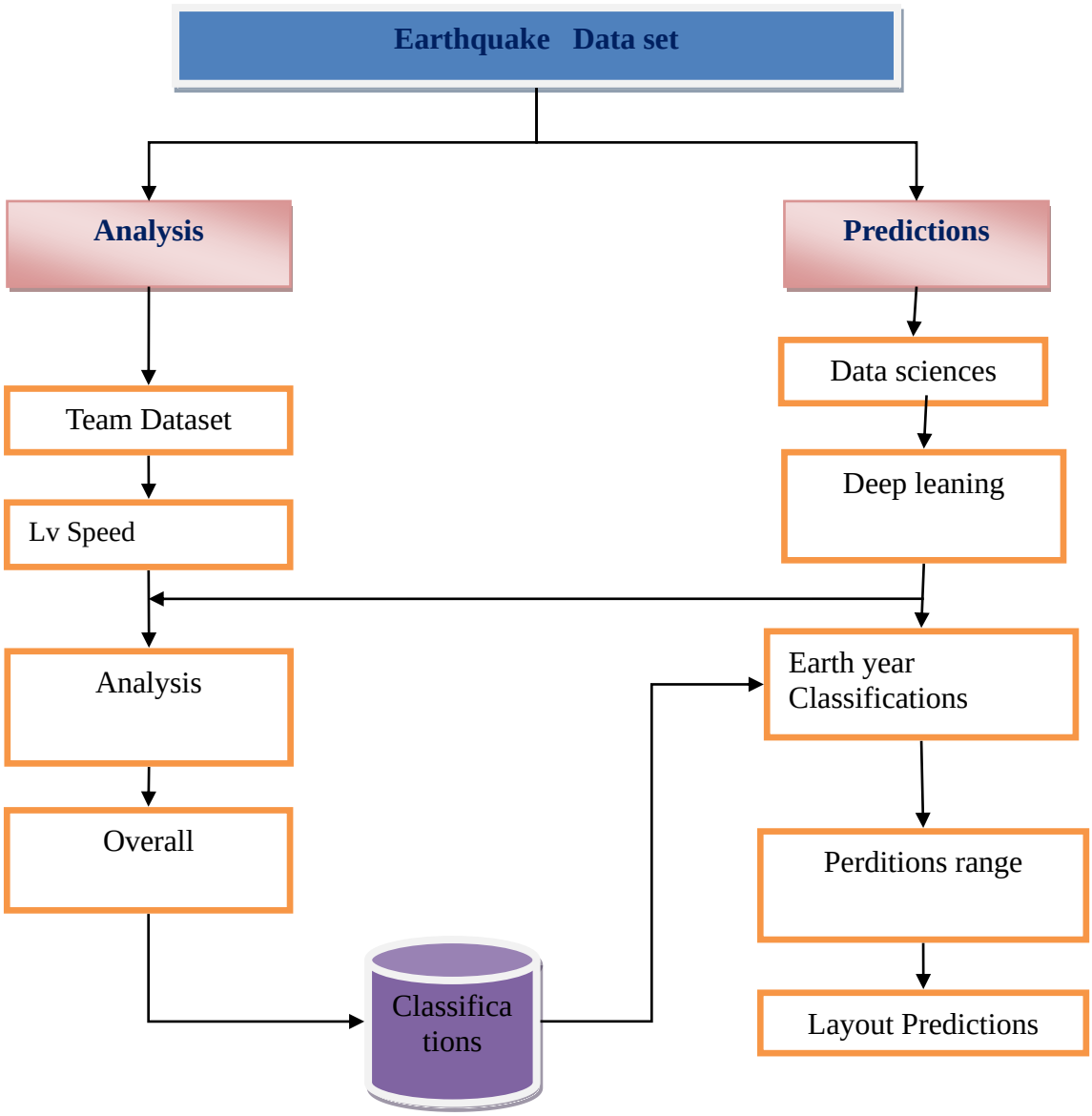

Fig.1 Architecture Diagram

2. DATA FLOW DIAGRAM

A data flow diagram is a two-dimensional diagram that explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

Level 0

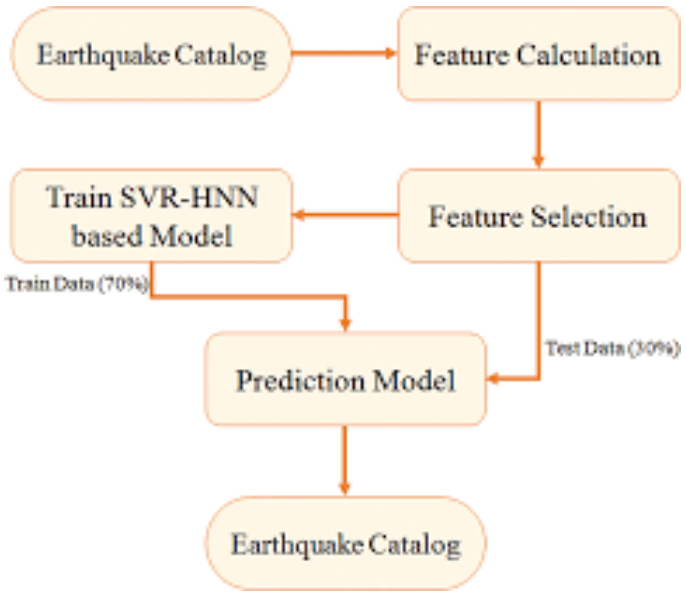

Fig .2 Data Classifications

3. USE CASE DIAGRAM

A use case is a list of steps, typically defining interactions between a role (known in Unified Modeling Language (UML) as an "actor") and a system, to achieve a goal. The actor can be a human, an external system, or time. In systems engineering, use cases are used at a higher level than within software engineering, often representing missions or stakeholder goals.

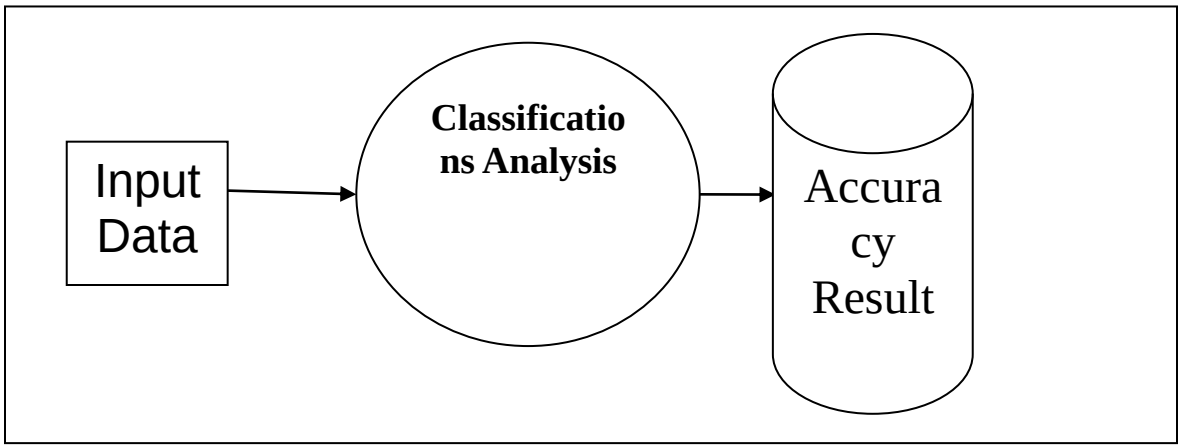

Fig . 3 Use Case Diagram

4.SEQUENCE DIAGRAM

A Sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart.

A sequence diagram shows object interactions arranged in time sequence. Sequence diagram is sometimes called event trace diagrams, event scenarios, and timing diagrams.

A sequence diagram shows, as parallel vertical lines, different processes that live simultaneously and horizontal arrows. The messages exchanged between them.

Sequence diagram has three objects. The connection between the objects is mentioned using stimulus and self stimulus.

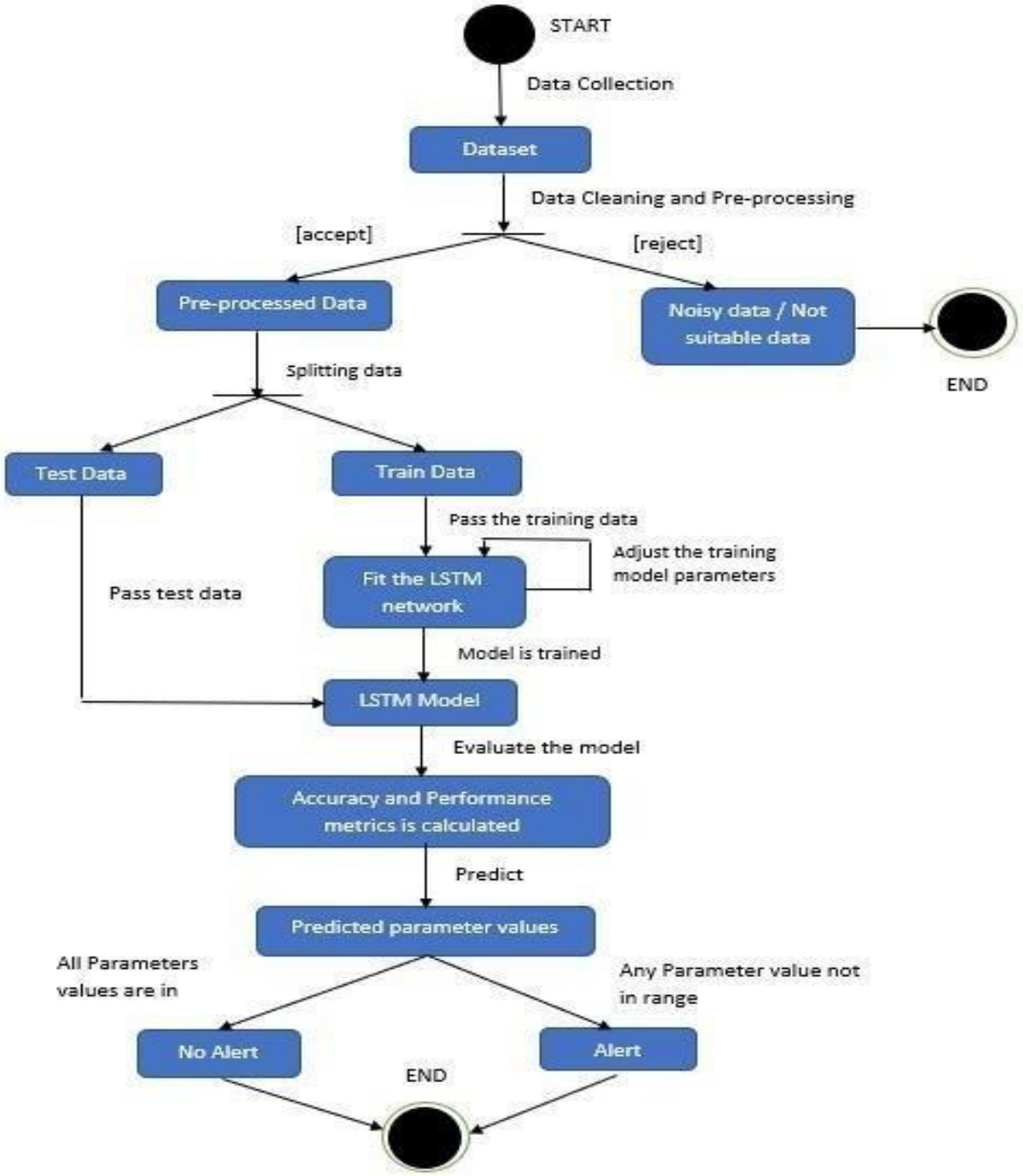

Fig .4 Sequence Diagram

CHAPTER 6

SYSTEM IMPLEMENTATION

6.1 LIST OF MODULES

- Data Set analysis.
- Preprocessing.
- Classifications for Earth quake Detection and prediction Strategies.
- Predictions
- Performance Evaluations

6.2 MODULE DESCRIPTION

- Data Set analysis.

  a comparative study method of prediction for Earthquake Prediction namely machine learning-based and deep learning-based methods. Three data normalization techniques in the data pre-processing stage were also compared. They are log scaling, min-max, and z-score normalization.

- Preprocessing:

  machine learning-based method, support vector regression (SVR) was used to develop the predictive model, whereas long-short term memory (LSTM) was used in the deep learning-based method to develop the predictive model. If a continuous predictor variable is smaller than a split point, the points to the left will be the smaller predictor points, and the points to the right will be the larger predictor points. The values of a categorical predictor variable Xi come from a small number of categories.

- Classifications for Earth quake Detection and prediction Strategies.

  Earthquake Prediction are becoming increasingly Dataset. Now that we have the data set, there has to be specific region given that can give the area to predict the earthquake. For this the user will provide certain parameters which will give us the region and on the basis of those parameters the data will be collected. For example, these are the parameters.

  var min Longitude = 24

  var max Longitude = 30

  var min Latitude = 140

  var max Latitude = 145

  These maximum and minimum values of latitude and longitude will give the area within which we want to predict the earthquake. The dialog box gives us a drop down list which can tell which regression algorithm we want to use to calculate earthquake magnitude. The list contains linear, ridge and lasso regression as the options. The user can select anyone from the three..

- Predictions
  - the prediction of its short-term return in this projects can provide some valuable suggestions for investors. From these parameters we know the region for which the data has to be collected. From the dataset the details about the region is extracted.

6.3 ALGORITHMS

6.3.1 ARIMA Classification

The Time Series Forecasting is generally used in many manufacturing companies as it drives the primary business planning, procurement, and production activities. Any forecasts' errors will undulate throughout the chain of the supply or any business framework, for that stuff. Thus, it is significant in order to get accurate predictions saving the costs, and is critical to success.

The ARIMA, abbreviated for 'Auto Regressive Integrated Moving Average', is a class of models that 'demonstrates' a given time series based on its previous values: its lags and the lagged errors in forecasting, so that equation can be utilized in order to forecast future values.

We can model any Time Series that are non-seasons exhibiting patterns and not a random white noise with ARIMA models.

There are three terms characterizing An ARIMA model:

p, q, and d

where,

p = the order of the AR term

q = the order of the MA term

d = the number of differences required to make the time series stationary

If a Time Series has seasonal patterns, we have to insert seasonal periods, and it becomes SARIMA, short for 'Seasonal ARIMA'.

Now, before understanding "the order of AR term", let us discuss 'd' term.

6.4 TESTING OBJECTIVES

Software testing is a method of assessing the functionality of a software program. There are many different types of software testing but the two main categories are dynamic testing and static testing. Dynamic testing is an assessment that is conducted while the program is executed; static testing, on the other hand, is an examination of the program's code and associated documentation. Dynamic and static methods are often used together.

6.5 SYSTEM TESTING

Testing is a set activity that can be planned and conducted systematically. Testing begins at the module level and work towards the integration of entire computers based system. Nothing is complete without testing, as it is vital success of the system.

- Testing Objectives:

There are several rules that can serve as testing objectives, they are

1. Testing is a process of executing a program with the intent of finding an error
2. A good test case is one that has high probability of finding an undiscovered error.

Testing used for implementation efficiency attempt to find ways to make a correct program faster or use less storage. It is a code-refining process, which reexamines the implementation phase of algorithm development. The most common types of testing involved in the development process are:

- Unit Test.
- Functional Test
- Integration Test
- White box Test
- Block box Test

6.5.1 UNIT TESTING

The first test in the development process is the unit test. The source code is normally divided into modules, which in turn are divided into smaller units called units. These units have specific behavior. The test done on these units of code is called unit test. Unit test depends upon the language on which the project is developed. Unit tests ensure that each unique path of the project performs accurately to the documented specifications and contains clearly defined inputs and expected results. Unit testing producing tests for the behavior of components (nodes and vertices) of a product to ensure their correct behavior prior to system integrations.

6.5.2 FUNCTIONAL TESTING:

Functional test can be defined as testing two or more modules together with the intent of finding defects, demonstrating that defects are not present, verifying that the module performs its intended functions as stated in the specification and establishing confidence that a program does what it is supposed to do.

6.5.3 INTEGRATION TESTING:

In integration testing modules are combined and tested as a group. Modules are typically code modules, individual applications, source and destination applications on a network, etc. Integration Testing follows unit testing and precedes system testing. Betas are often widely distributed or even distributed to the public at large in hopes that they will buy the final product when it is released.

6.5.4 WHITE BOX TESTING:

Testing based on an analysis of internal workings and structure of a piece of software. This testing can be done sing the percentage value of load and energy. The tester should know what exactly is done in the internal program. It includes techniques such as Branch Testing and Path Testing.

6.5.5 BLACK BOX TESTING:

In black box testing tester have without knowledge of the internal workings of the item being tested. Tests are usually functional. This testing can be done by the user who has no knowledge of how the shortest path is found.

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

This paper proposes It is great of how these technologies can help in real life applications. Machine learning provides several algorithms like Classification, Clustering, Regression and many more, each algorithm is used depending upon the data sets and project requirement. I used Regression because the goal was to make prediction. I have used Linear, Ridge and Lasso Regression for making prediction. After implementing and training data using these three regression, linear regression gave the mean least error. Predictions are quite satisfying if model is trained on earthquake data collections LSTM. if one day ahead is being predicted. For long term predictions, larger dataset would have to be used for training which would include data for all four seasons. This can be used for planning of production and usage of wind turbines, which would significantly decrease problems which occur due to variability of data collections. The detection and calculation of down time periods and losses is somehow uncomplicated earthquake analysis .

7.2 FUTURE ENHANCEMENTS

In future work, a novel method to predict, that is based on a hybrid machine learning and swarm intelligence approach. The results of the conducted experiments suggest that the proposed model obtains higher accuracy than other recent similar approaches, and that it can be successfully applied for this importantask.

CHAPTER – 8

APPENDIX

8.1 SOURCE CODING:


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8.2 OUTPUT SCREENSHOT

5. Earthquake Prediction And Analysis

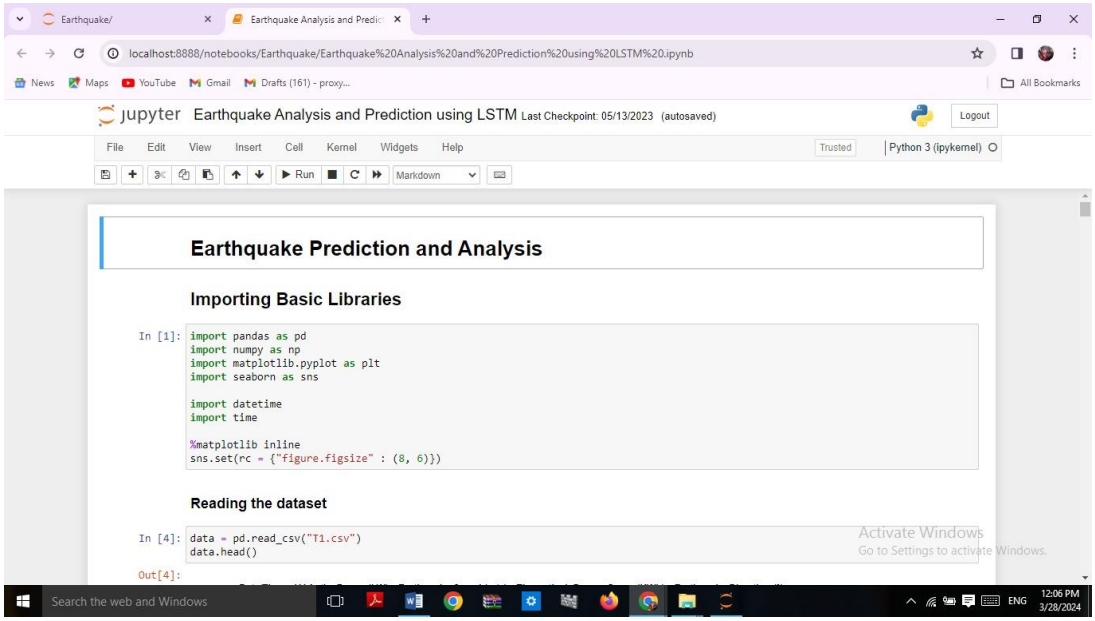


Figure .5 Earthquake Prediction And Analysis

6. Visualization

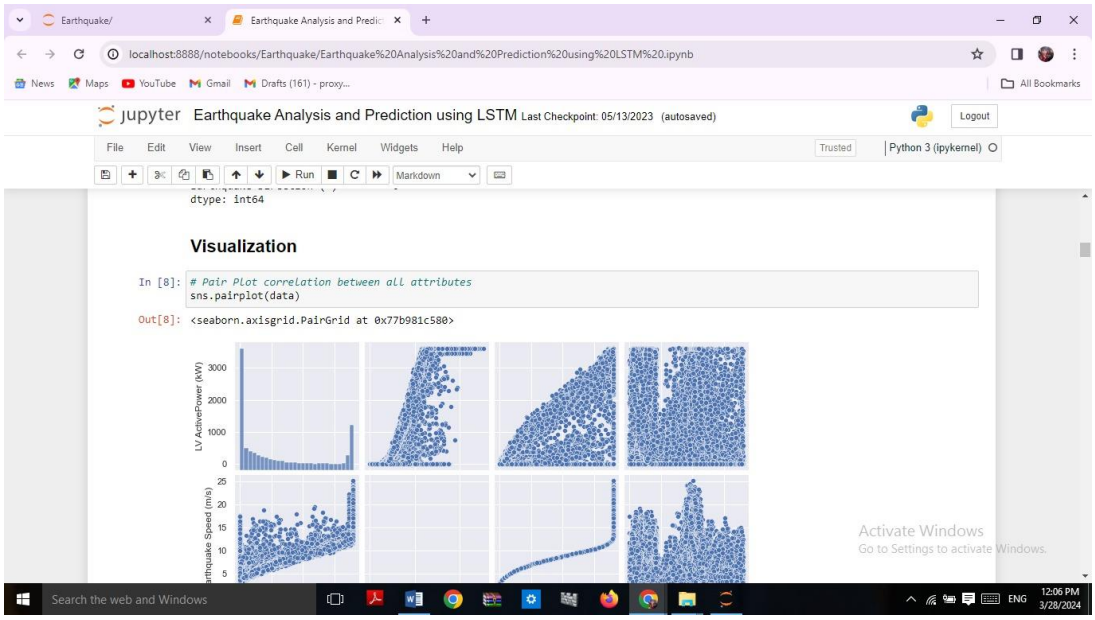


Figure.6 Visualization

7. Data Wrangling

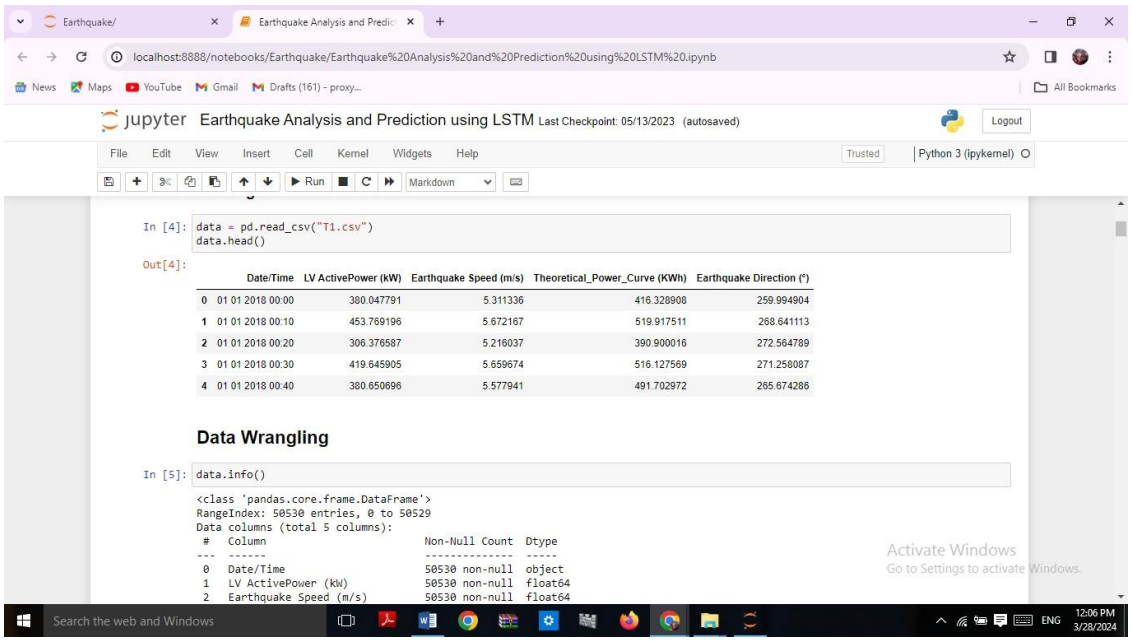


Figure .7 Data Wrangling

8. KDE Plot

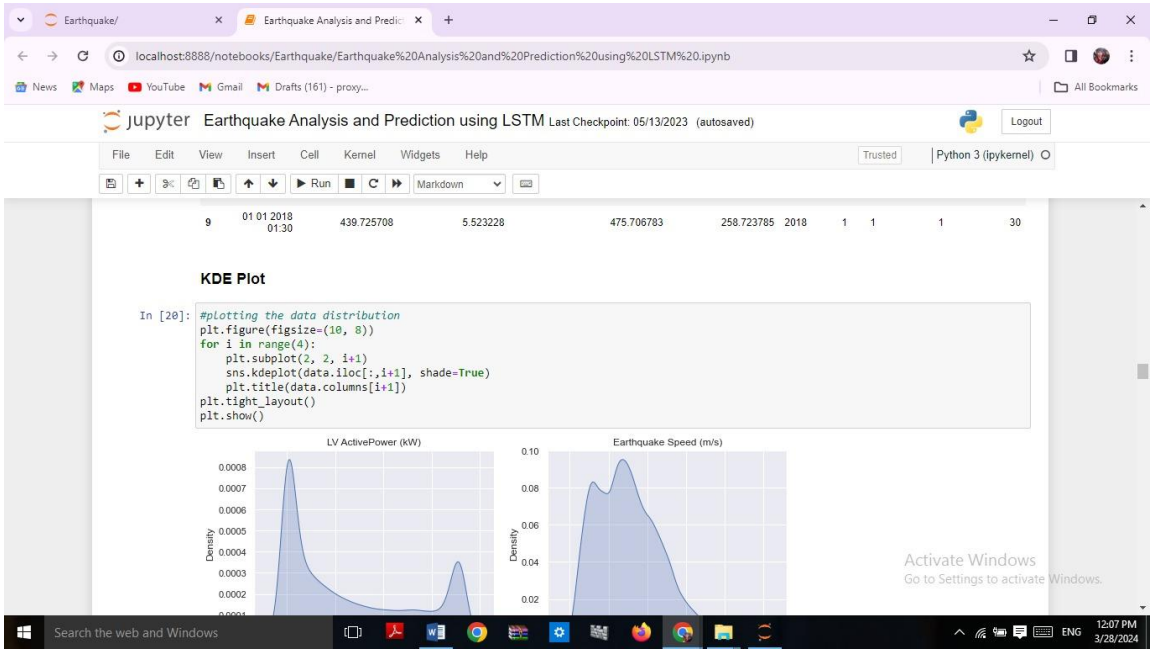
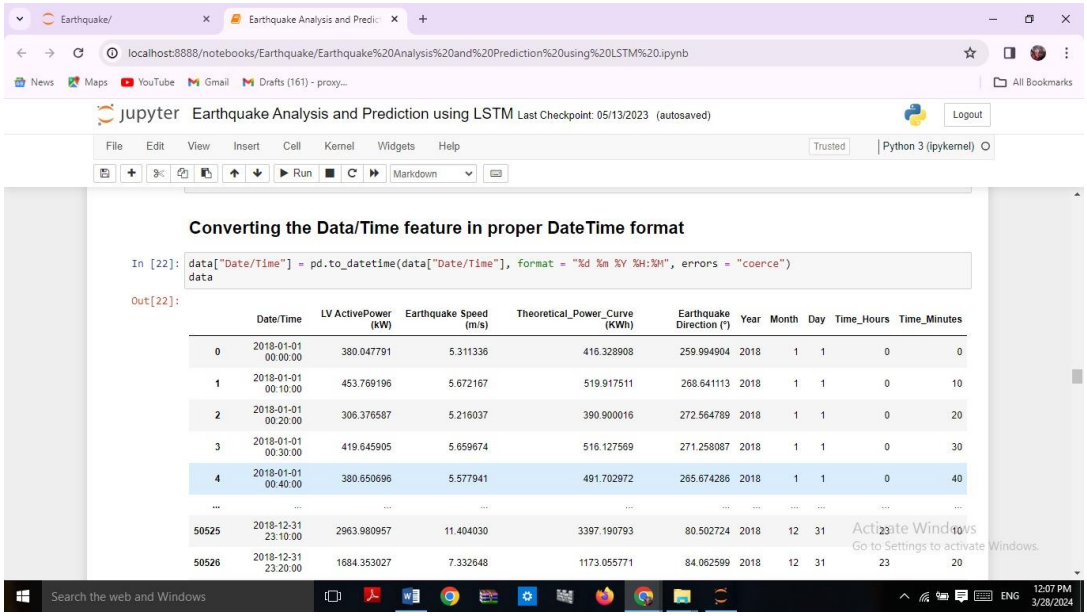


Figure.8 KDE Plot

9. Converting The Data/Time Feature In Proper Dte Time Formate



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2	2018-01-01 00:20:00	306.376587	5.216037	390.900016	272.564789	2018	1	1	0	20
3	2018-01-01 00:30:00	419.645905	5.659674	516.127569	271.258087	2018	1	1	0	30
4	2018-01-01 00:40:00	380.650696	5.577941	491.702972	265.674286	2018	1	1	0	40
...	...	...	...	...	...	...	...	...	...	...
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Figure .9 Converting The Data/Time Feature In Proper Dte Time Formate

10. Importing Basic Libraties

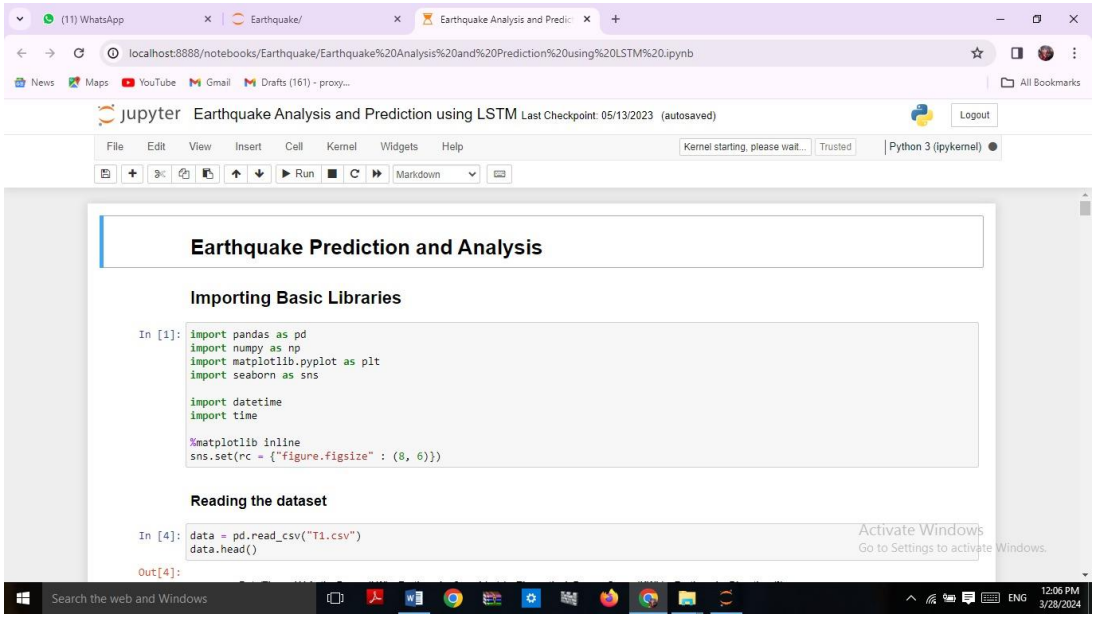

Figure .10 Importing Basic Libraties

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