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Credit Card Fraud Detection Using Machine Learning

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ABSTRACT: In recent years credit card became one of the essential parts of the people. Sudden increase in E-commerce, customer started using credit card for online purchasing therefore risk of fraud also increases. Instead of carrying a huge amount in hand it is easier to keep credit cards. But nowadays that too becomes unsafe. Now a days we are facing a big problem on credit card fraud which is increasing in a good percentage. The main purpose is the survey on the various methods applied to detect credit card frauds. From the abnormalities, in the transaction, the fraudulent one is identified. We address this issue in order to implement some machine learning algorithm like random forest, logistic regression in order to detect this kind of fraud. In this paper we increase the efficiency in finding the fraud. However, we discussed and evaluated employee criteria. Currently, the issues of credit card fraud detection have become a big problem for new researchers. We implement an intelligent algorithm which will detect all kind of fraud in a credit card transaction. We handled the problem by finding a pattern of each customer in between fraud and legal transaction. Logistic regression Algorithm and Local Outlier Factor are used to predict the pattern of transaction for each customer and a decision is made according to them. In order to prevent data from mismatching, all attribute are marked equally. This study investigates logistic regression on extremely biased credit card fraud data. The accuracy of the logistic regression technique will be closer to 0.98%; with this accuracy, frauds may be easily detected.

KEYWORDS: fraud detection, logistic regression, accuracy.

I. INTRODUCTION

Nowadays as we can see that there is a huge increase online payment and the payment is mostly done with the help of credit cards. It becomes a big problem for marketing company to overcome with the credit card fraudulent activities. Fraudulent can be done in many ways such as tax return in any other account, taking loans with wrong information etc. Therefore, we need an efficient fraudulent detection model to minimize fraudulent activity and to minimize their losses. There are a huge number of new techniques which provide different algorithms which help in detecting number of credit card fraudulent activity. Basic understanding of these algorithms will help us in making a significant credit card fraudulent detection model. This paper helps us in finding doubtful credit card transaction by proposing a machine learning algorithms. Credit Card Fraudulent detection comes under machine learning, and the objective is to reduce such type of fraudulent activity. This type of fraud is happening from past, and till now not much research has done here in this particular area. The types of credit fraud in transactions are bankruptcy fraud, behavioral fraud, counterfeit fraud, application fraud. There are experiments done before on credit card fraudulent activity on basis of meta-learning. There is certain limit of meta-learning. There are two features which is introduced here in our report is True Positive and False alarm. Both these features play an important role in catching fraudulent because the rate of determining fraudulent behavior is quick. For the better performance of model, we need a better classifier. Different classifier can be combined together with help of meta-learning.

II. LITERATURE SURVEY

There are a huge number of new techniques which provided different algorithms which help in detecting number of credit card fraudulent activity. Basic understanding of these algorithms will help us in making a significant credit card fraudulent detection model. This paper helps us in finding doubtful credit card transaction by proposing a machine learning algorithms. There are two features which is introduced here in our report is True Positive and False alarm. Both these features play an important role in catching fraudulent because the rate of determining fraudulent behavior is quick. As per today's Network plays an important role therefore it is mandatory for our models to be up to date to

perform better detection capabilities. Whenever new fraudulent activity are detected then our model should be that much better to perform real time analysis. Other than traditional machinelearning methods Fraudulent Detection System has been achieved through using Neural Networks.To prevent personal information has become a huge task for financial company because there are a lot of attack on the system to steal someone personal information to perform fraudulent. Our model has two essential feature which will help in finding abnormal behavior in form of charts for different column such as time, amount etc. logistic regression for credit card fraud detection would delve into various studies and research papers focusing on this specific application. It would likely include discussions on the effectiveness of logistic regression in detecting fraudulent transactions, comparisons with other machine learning algorithms, such as decision trees or support vector machines, and analyses of different feature engineering techniques used to enhance the model's performance.

III.METHODOLOGY

The task which is performed for the prediction of transaction and labelled as fraud is detected on the basis of binary classification. We make two class for the prediction of fraud: class 0 and class 1.

Class 0 if there is no fraud and class 1 to catch the fraud. This can be done with the help binary classification. Unusual pattern which is known as outliers which not fulfill the expected behaviors is known as Anomaly detection. Many business applications are based upon this technique, unusual patterns in network are identified. Its helps in detecting credit card fraudulent as well as operating system fraudulent.Outlier value is those value which shows an abnormal behavior from its neighbor or we can say that from standard data point. Generally, Outlier data termed as fraudulent transaction.

There are many advantages of this system and one of the major advantage that we are recognizing the pattern and on the basis of pattern we made chart which will help to understand the fraudulent easily because it is easy to understand the data in the form of chart. We have plotted the chart for every features from V1 to V28. We should also keep the things in mind that other financial bank cannot read the other personal information.

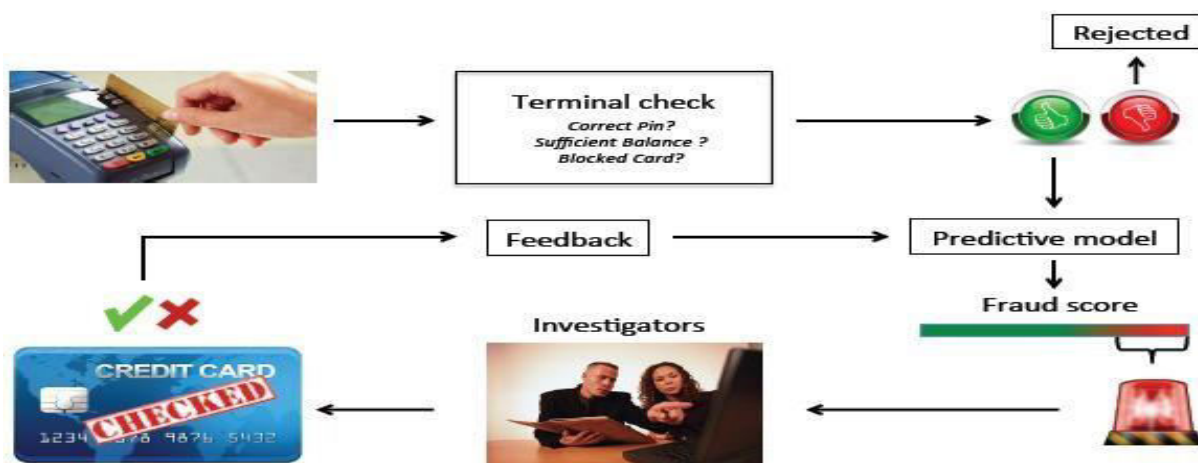


Figure 3.1: Block Diagram

The datasets contains the numerical value which can be called as PCA transformation. Due to security issue, unfortunately we cannot take the original features and information about data. Column V1 to V28 are taken as principal components. The features which is not transformed with PCA are “Time” and “Amount”. The advantages of this system is that it can work in an efficient way for the limited amount of data. We examine the accuracy and it is quite satisfactory.

IV. PROPOSED SOLUTION

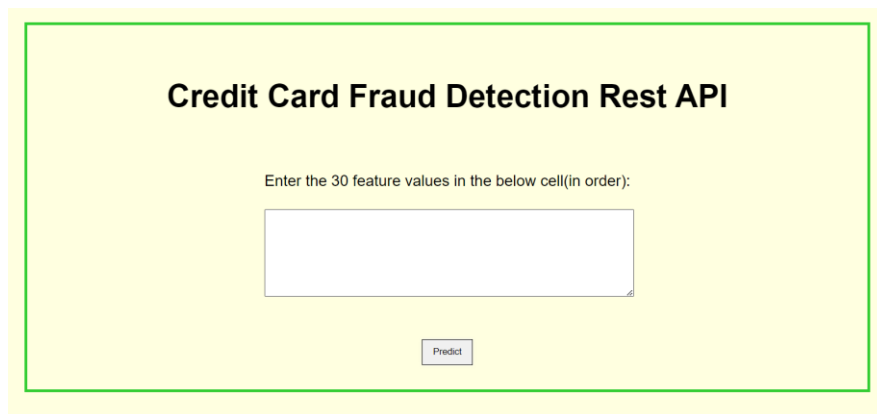
Logistic Regression :

Logistic Regression model is a static model where evaluations are formed of the connection among dependent qualitative variable (binary or binomial logistic regression) or variable with three values or higher (multinomial logistic regression) and one independent explanatory variable or higher whether qualitative or quantitative. The last model created using both R and Weka is Logistic Regression, the model managed to score and accuracy of 99.92% in R with 70 misclassified instances, while it scored 99.91% in Weka with 77 misclassified instances as presented.

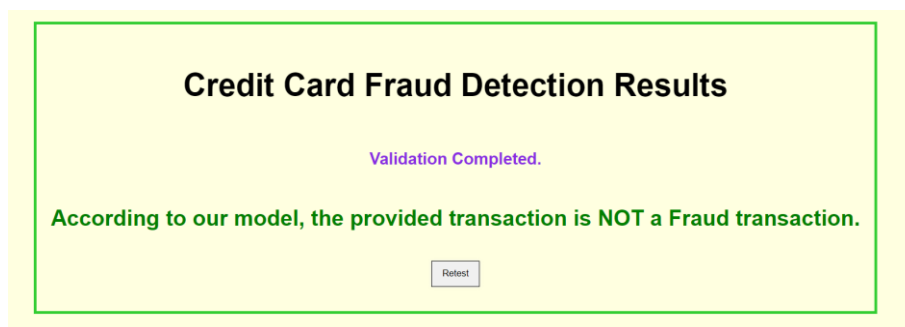
Logistic regression is a supervised learning classification approach for predicting a target variable's probability. The goal or variable quantity has a dichotomous character, which means there are only two possible classes. In plain English, the variable quantity is doubled, with information coded as either 1 (represents success/yes) or 0 (represents disappointment/no). $P(Y=1)$ is predicted as an element of X by a computed relapse model. It's one of the greatest ML calculations, which will be used for a variety of concerns such as spam detection, diabetes prediction, malignant growth detection, and so on. Logistic Regression's Benefits are linearly separable datasets, logistic regression works well, While logistic regression is less prone to overfitting, it can still overfit in high-dimensional datasets. In these cases, regularisation (L1 and L2) approaches should be used to minimise over-fitting, Logistic regression not only provides a proportion of how important an indicator (coefficient size) is, but also the direction in which it is related (positive or negative).

V. RESULT ANALYSIS

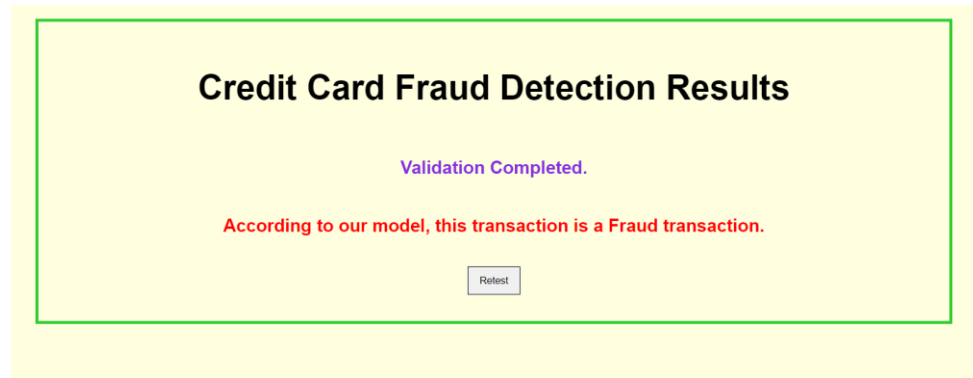
In this model, a web page is created for showing the result whether the transaction done is fraudulent or not.



Here we have to enter the values like time, amount and some other parameters I.e., V1-V28. After entering those values model can predict the transaction is fraudulent or not.



The above image represents the model predicts the entered values are not fraudulent.



The above image represents the model predicts the entered values are fraudulent.

VI.CONCLUSION

In this model, we discussed about credit card fraud detection using machine learning. The proposed model has been extensively tested on different types of transactions. The results were promising, almost all the fraudulent transactions could be detected successfully, and the proposed methodology has been compared with existing method and the results shows that proposed method performs superior than existing methods. In this model, we detected the fraudulent transactions and recognized which illustrates the robustness of the proposed system. This proposed model took the trained dataset and performed classification on basis of them, if the transaction was legal then it moved to class 0 and if the transaction was fraud then it moved to class 1, and significantly improve the detection accuracy. The proposed method works efficiently in various platform, vivid environment and is a full- fledged cross platform application. The system has depicted robust, scalable and accurate performance to the degree that efficiency is taken into consideration in the Credit Card Fraud Detection System. The system takes into consideration various factors and has been fulfilling or meeting all the project specifications document.

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