Risk Prediction In Corporate Financial Management Using IBM Auto Ai Service

1. INTRODUCTION

1.1 Overview

This project discusses building a system for creating predictions that can be used in different scenarios. It focuses on predicting fraudulent transactions, which can reduce monetary loss and risk mitigation by building a web application

Using IBM AutoAI, we automate all of the tasks involved in building predictive models for different requirements. You create a model from a data set that includes the gender, married, dependents, education, self-employed, applicant income, co-applicant income, loan amount, loan term, credit history, housing, and locality.

1.2 Purpose

Many financial firms are increasing their use of AI models because they can represent the real world more accurately, and they can deliver better projections than traditional, rule-based models. But some AI models can add complexity and risk.Most financial firms have model risk management frameworks in place that have been optimized for traditional, rule-based models. New approaches are needed for the new challenges that AI models present. In addition, it can take months to validate a model, and often the AI expertise that is required is in short supply.

2. LITERATURE SURVEY

2.1 Existing problem

To improve the accuracy of financial risk prediction, principal component analysis and particle swarm algorithm are applied to optimize the BP neural network model, the input data of the prediction model is improved, and the optimal initial weights and thresholds are given to the BP neural network by using particle swarm algorithm search, whereby the financial risk prediction model of particle swarm

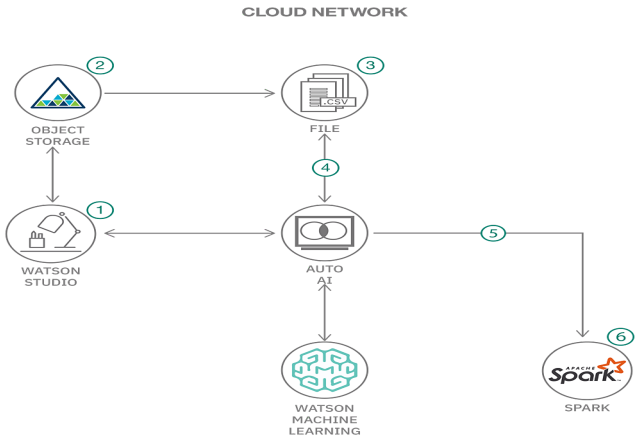
optimization BP neural network is constructed. The empirical results show that the model constructed by BP neural network not only has a high accuracy rate for static financial risk evaluation but also has a better prediction effect. After training and testing, the BP neural network-based enterprise financial risk evaluation model can accurately determine the existing financial situation of enterprise financial management and has a good prediction effect. Our research method is a fusion of the processing of the two methods, which belongs to the first integration of results.

2.2 Proposed solution

AutoAI uses AI to build AI. It generates several model pipelines which are displayed on the leaderboard. This enables you to easily compare the performance of different candidate models and select the best one based on several automatically calculated metrics. AutoAI can also be used by model validator to generate challenger models – a common practice for in today's model risk teams – and help ensure the optimum model is chosen in the end.In addition, AutoAI accelerates the entire model life cycle by automating mundane basic tasks that can take data scientists days or even weeks. The data science team can focus on higher-value work that makes better use of their expertise.

3. THEORITICAL ANALYSIS

3.1 Block diagram Diagrammatic overview of the project.

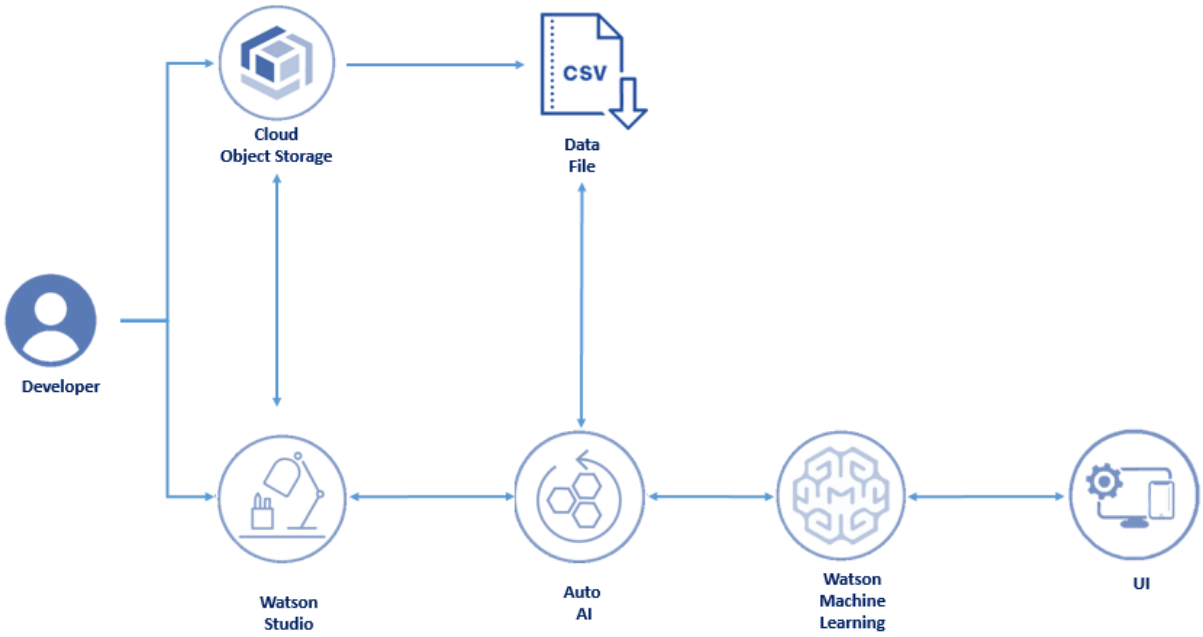


3.2 Hardware / Software designing Hardware and software requirements of the project

Services Used:

1. IBM Watson Studio
2. IBM Watson Machine Learning
3. Node-RED
4. IBM Cloud Object Storage

Technical Architecture:



4. EXPERIMENTAL INVESTIGATIONS

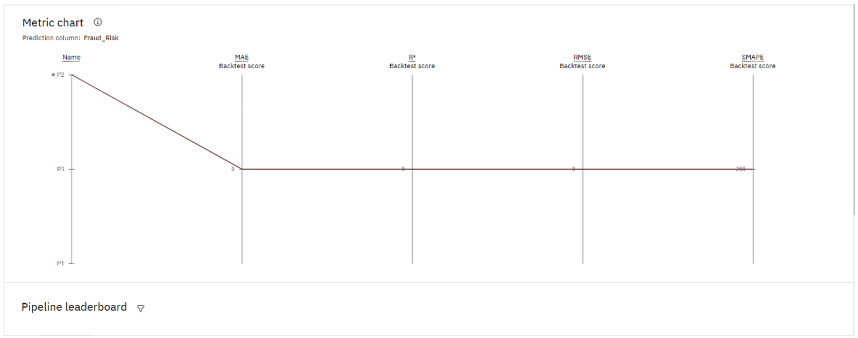
In this Activity, We gonna build a machine learning model that predicts fraudulent transactions based on the following parameters

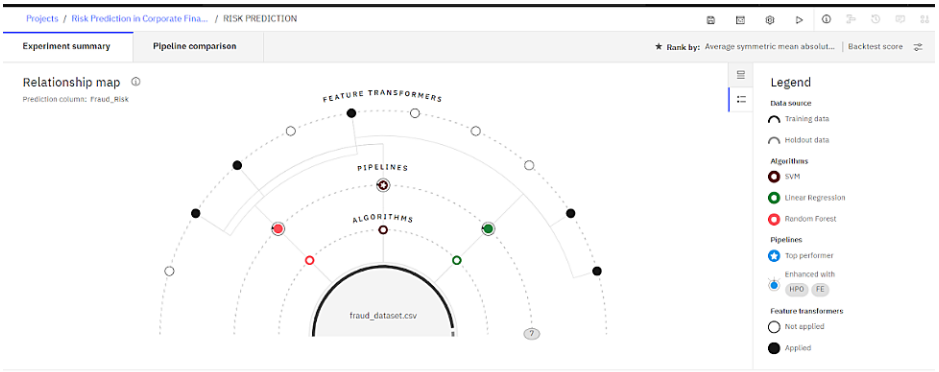
- Gender,
- Marital Status
- Dependents
- Education,
- Self-employed
- Applicant income
- Co-applicant income
- Loan amount
- Loan term

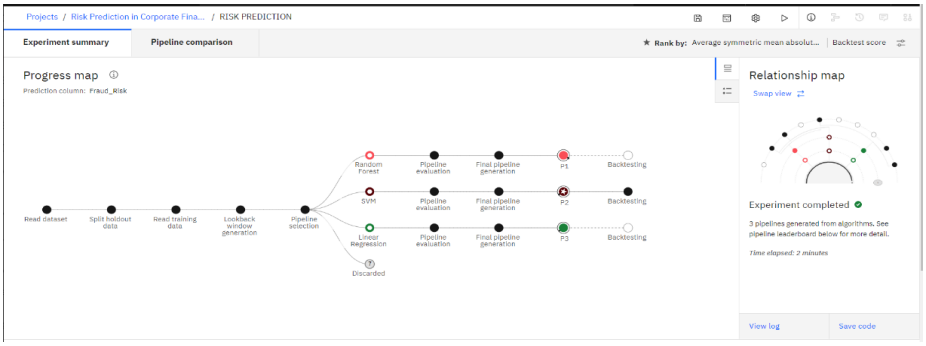
Data set:

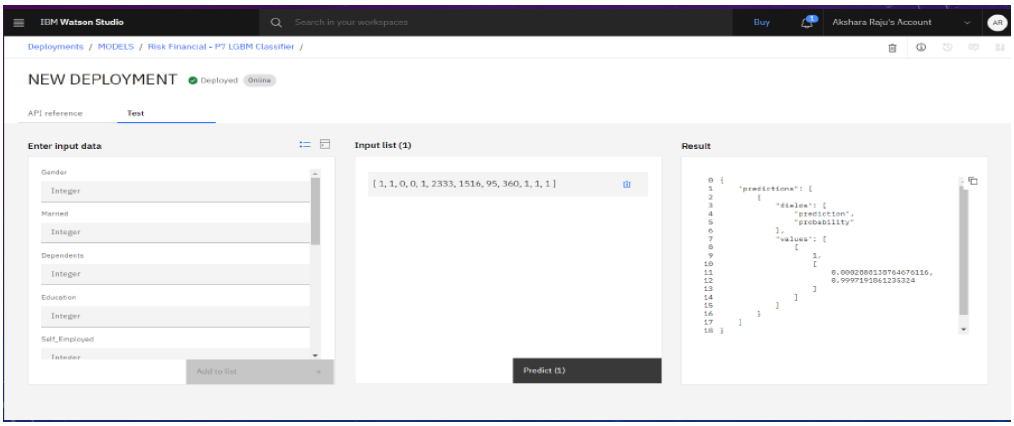
	Gender	Married	Dependen	Education	Self_Empl	Applicant	Coapplica	LoanAmo	Loan_Terr	Credit_His	Housing	Locality	Fraud_Risk
2	1	0	0	1	0	5849	0	146	360	1	1	1	0
3	1	1	1	1	1	4583	1508	128	360	1	1	3	1
4	1	1	0	1	1	3000	0	66	360	1	1	1	1
5	1	1	0	0	1	2583	2358	120	360	1	1	1	1
6	1	0	0	1	0	6000	0	141	360	1	1	1	0
7	1	1	2	1	1	5417	4196	267	360	1	0	1	1
8	1	1	0	0	1	2333	1516	95	360	1	1	1	1
9	1	1	3	1	1	3036	2504	158	360	0	1	2	1
10	1	1	2	1	1	4006	1526	168	360	1	1	1	1
11	1	1	1	1	1	12841	10968	349	360	1	0	2	1
12	1	1	2	1	1	3200	700	70	360	1	0	1	1
13	1	1	2	1	1	2500	1840	109	360	1	0	1	1
14	1	1	2	1	1	3073	8106	200	360	1	0	1	1
15	1	0	0	1	0	1853	2840	114	360	1	1	3	1
16	1	1	2	1	1	1299	1086	17	120	1	1	1	1
17	1	0	0	1	0	4950	0	125	360	1	1	1	0
18	1	0	1	0	0	3596	0	100	240	1	1	1	0
19	0	0	0	1	0	3510	0	76	360	0	1	1	1
20	1	1	0	0	1	4887	0	133	360	1	1	3	1
21	1	1	0	1	1	2600	3500	115	12	1	1	1	1
22	1	1	0	0	1	7660	0	104	360	0	1	1	1
23	1	1	1	1	1	5955	5625	315	360	1	0	1	1
24	1	1	0	0	1	2600	1911	116	360	0	1	2	1
25	0	1	2	0	1	3365	1917	112	360	0	0	3	1
26	1	1	1	1	1	3717	2925	151	360	1	0	2	1

fraud_dataset









5. PROJECT FLOW

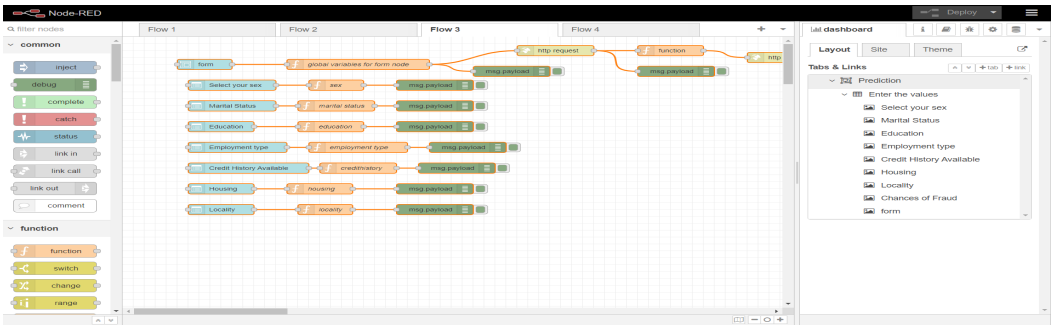
- Log in to IBM account
- Create IBM Watson Studio and Node-RED Service
- Create a Watson studio project

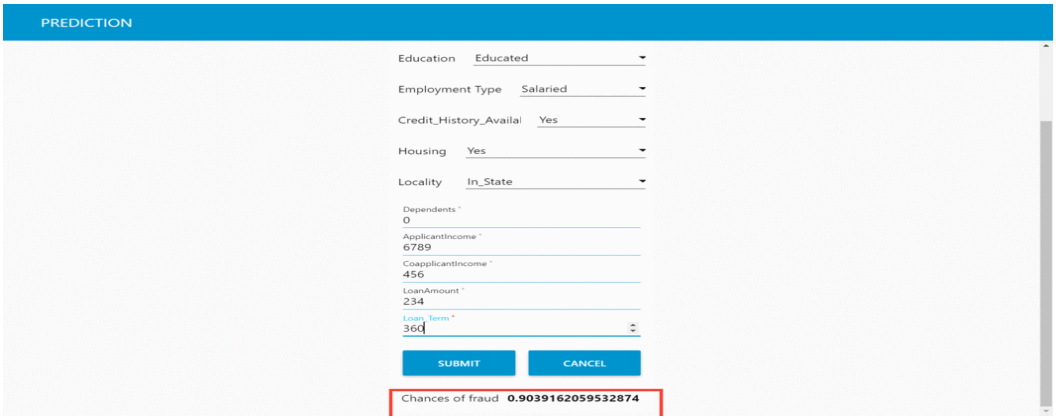
- ADD Auto AI Experiment
- Run the Auto AI Experiment to build a Machine learning model on the desired dataset
- Save the model
- Deploy the model as a web server and generate scoring End Point
- Create a WEB application Using Node-RED to take user input and showcase Prediction on UI

6. FLOWCHART

7. RESULT

Node-Red integration with auto Ai model:





8. ADVANTAGES AND DIS ADVANTAGES

Advantages:

- XGBoost is an efficient and easy to use algorithm which delivers high performance and accuracy as compared to other algorithms. XGBoost is also known as regularized version of GBM. let's see some of the advantages of the XGBoost algorithm.
- Regularization: XGBoost has in-built L1(lasso regression)and L2(ridge regression)regularization which prevents the model from overfitting. That is why, XGBoost is also called regularized form of GBM(gradient Boosting Machine). While using scikit learn library, we pass two hyper- parameters (alpha and lambda)to XGBoost related to regularization. Alpha is used for regularization and lambda is used for L2 regularization.
- parallel processing : XGBoost utilizes the power of parallel processing and that is why it is much faster than GBM.it uses multiple CPU cores to execute the model.

- Handling missing values : XGBoost has an in-built capability to handle missing values. When XGBoost encounters a missing values at a node, it tries both the left and right hand split and learns the way leading to higher loss for each node. It then does the same when working on the testing data.

Disadvantages:

Well XGBoost(as with other boosting techniques)is more likely to overfit than bagging does(ie; random forest)but with a robust enough dataset and conservative hyperparameters, higher accuracy is the reward. XGBoost takes quite a while to fail, that's another drawback when compared to more naive approaches .Overall though, as far as boosting goes, XGBoost is an upgrade on an idea(gradient boosting)that was itself an improvement on naive bagging techniques. Because it was created relatively recently and its design took into account the issues with existing models, it tends to outperform them based on those matrices, it's important to remember that XGBoost is essentially just regular gradient.

9. APPLICATIONS

We can integrate this with Node red to make it a fully working website which can be partnered with any hospital. We have also used IBM Watson Assistant to make the feel convenient and know more about their body.

10. CONCLUSION

The main aim of this project was to design and implement Risk Prediction using Machine Learning methods and performed analysis of that methods and it has been achieved successfully. The proposed approach uses XGBoost classifier with hyperparameter tuning and feature engineering using IBM Auto AI service. And 77% classification accuracy has been achieved. This project discusses building a system for creating predictions that can be used in different scenarios. It focuses on predicting fraudulent transactions, which can reduce monetary loss and risk mitigation by building

a web application **.**

11. FUTURE SCOPE

Banking is not new to the trends of Artificial Intelligence and Machine Learning technologies. The sector has rapidly adopted technology to stay up to date with the current market trends. It uses this technology to keep a record of customer data, which was earlier a monotonous manual task. With the rapid increase in the amount of data that is being generated and stored in the banking sector, today, Artificial Intelligence and ML allow professionals to do the same accurately and efficiently. Some of the ways in which AI has made a significant difference in the field of banking include better customer support, enhanced data quality, prevention of fraud, digital assistants, and more.

12. BIBILOGRAPHY

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APPENDIX