

Financial Risk Prediction Using IBM Auto AI

1.INTRODUCTION

a.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.

b.Purpose

Financial risk prediction is an important and widely studied topic in the domain of financial analysis since it can help companies to detect financial risks in advance and take appropriate actions to minimize the defaults.

Financial Risk Prediction is the activity of monitoring financial risks and managing their impact. It is a sub-discipline of the wider task of managing risk, that is, controlling the effects of uncertain and generally adverse external developments (or events) on the firm's activities or projects. It is a practical of modern finance theories, models and methods.

2.LITERATURE SURVEY

a.Existing problem

Some of the common and distinct financial risks include credit risk, liquidity risk, and operational risk. Financial risk is a type of danger that can result in the loss of capital to interested parties. For governments, this can mean they are unable to control monetary policy and default on bonds or other debt issues

b.Proposed Solution

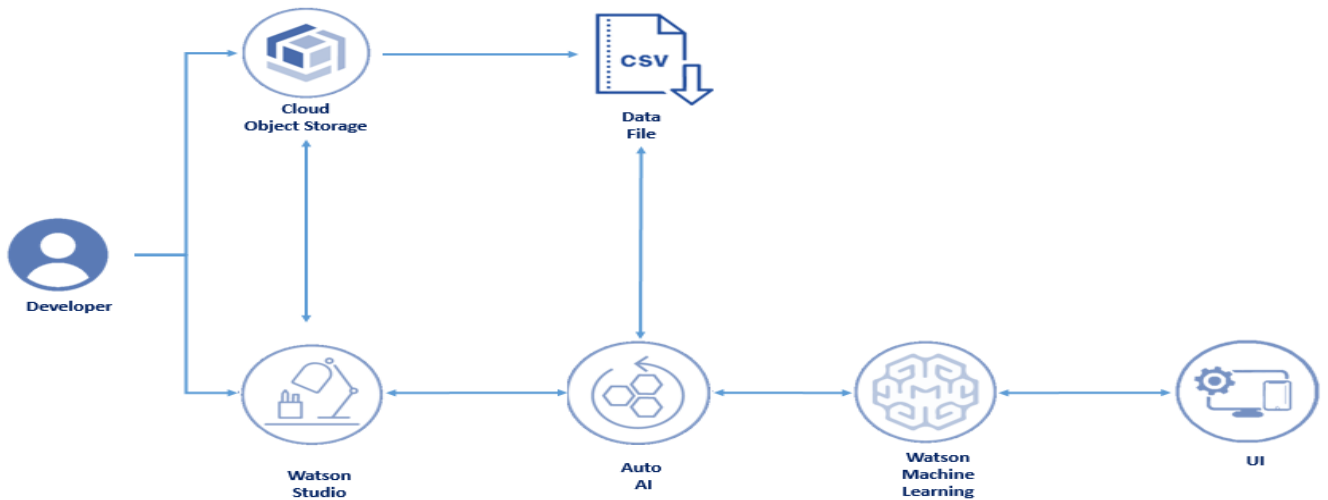
The Proposed Solution for the Financial Risk Prediction is by using IBM Auto AI and Node Red Services which are used to build the Application by taking the inputs from the user and showcases the prediction on UI.

The services used in this are:

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

3.THEORETICAL ANALYSIS

a.Block Diagram

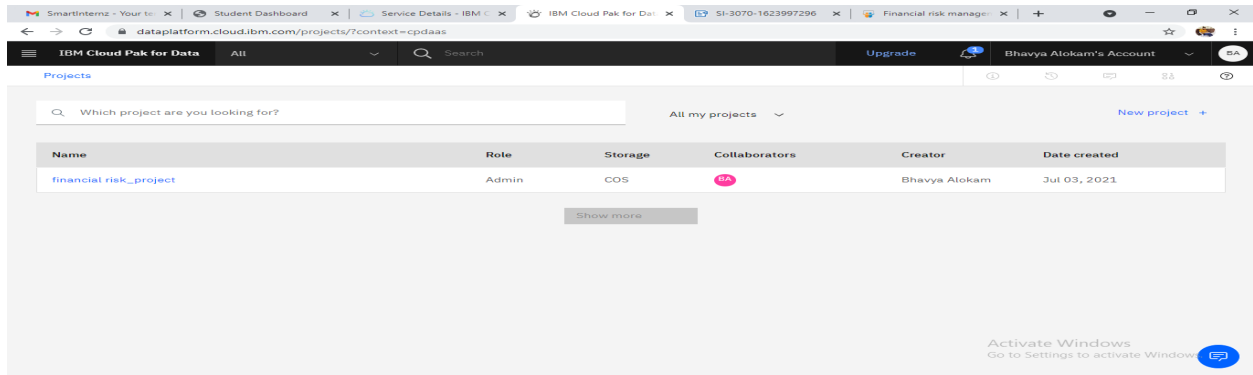


4.Experimental Investigation

➤ The First Step is to collect the Dataset. The Dataset contains the following fields:

- Gender,
- Marital Status
- Dependents
- Education,
- Self-employed
- Applicant income
- Co-applicant income
- Loan amount
- Loan term
- Credit history
- Housing
- Locality.

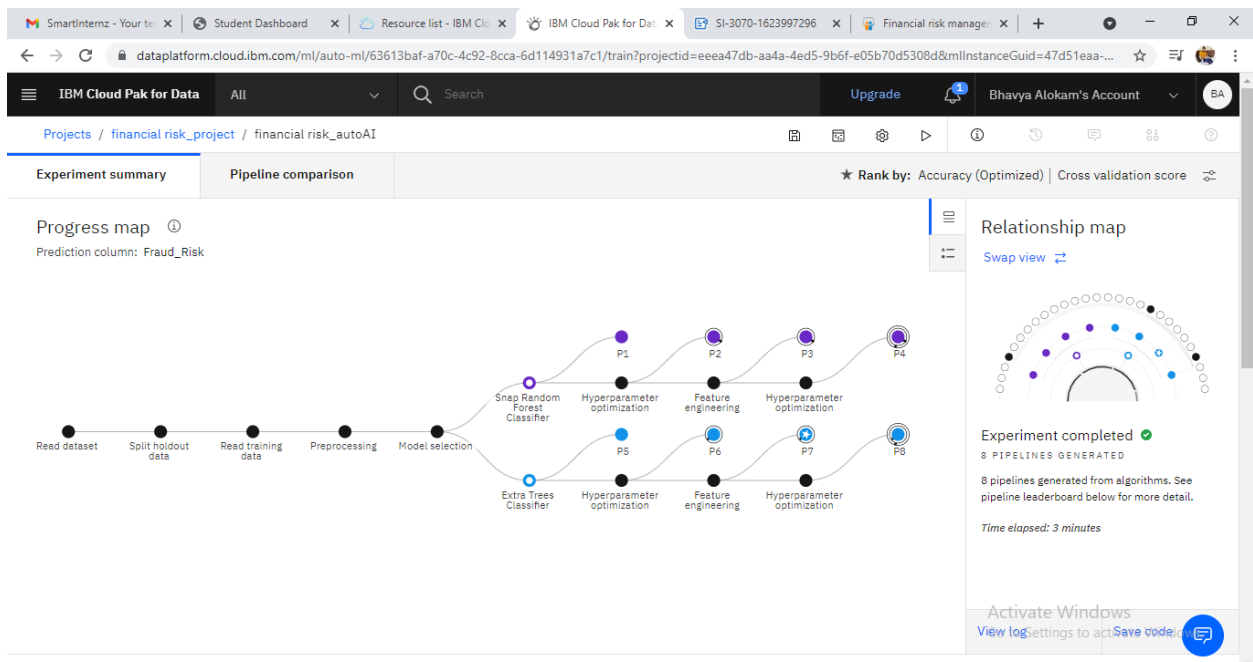
➤ The Next Step is to Create Watson Studio Project.



➤ After the creation of project in watson you have to create an Auto AI Experiment.

To add the project

- Click on Add Project from Watson Studio project
 - Select Auto AI
 - Specify a name and description for your experiment.
 - Select a machine learning service instance and click Create
- Upload the Fraud dataset and run the Auto AI Experiment



➤ Later on save the model and Deploy and test the Model

Once the pipeline creation is complete, you can view and compare the ranked pipelines in a leaderboard. Choose Save model from the action menu for the pipeline with the highest accuracy or low error rate This saves the pipeline as a Machine Learning asset in your project. A notification gives you the link to view the saved model in your project.

► Deploying the Model and Testing with various inputs

The screenshot displays the IBM Cloud Pak for Data web interface. The main content area shows the deployment details for 'financial_risk_deploy', which is marked as 'Deployed' and 'Online'. The 'API reference' tab is active, showing the 'Direct link' and 'Endpoint' information. The 'Code snippets' section provides a cURL command for testing the deployment. A right-hand sidebar displays a summary of the deployment, including its creation and update timestamps, deployment ID, software specification, and a description field that currently says 'No description provided. Activate Windows'.

financial_risk_deploy Deployed Online

API reference Test

Direct link

Endpoint Bearer <token>

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/53f0e999-0d37-4574-a665-e95405dcbe12?context=cpdaas&space_id=5ce9041a-3f67-47cc-b83f-ea70f040f86a` IAM

Code snippets

cURL	Java	JavaScript	Python	Scala
<pre># NOTE: you must set \$API_KEY below using information retrieved from your IBM Cloud account. curl --insecure -X POST --header "Content-Type: application/x-www-form-urlencoded" --header "Accept: application/json" --data-ur # the above CURL request will return an auth token that you will use as \$IAM_TOKEN in the scoring request below # TODO: manually define and pass values to be scored below curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: Bearer \$IAM_TOKEN"</pre>				

financial_risk_deploy

Created Jul 3, 2021 6:01 PM

Updated Jul 3, 2021 6:01 PM

Deployment ID 53f0e999-0d37-4574-a665-e9...

Software specification [hybrid_0.1](#)

Hybrid pipeline software specifications [autoai-kb_3.3-py3.7](#)

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Description No description provided. Activate Windows. Go to Settings to activate Windows.

Tags Add tags to make assets easier to find.

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dataplatfom.cloud.ibm.com/ml-runtime/deployments/53f0e999-0d37-4574-a665-e95405dcbe12/test?space_id=5ce9041a-3f67-47cc-b83f-ea70f040f86a&context=cpdaas&flush...

IBM Cloud Pak for Data All Search Upgrade Bhavya Alokam's Account BA

Deployments / financial_risk_deployment / financial_risk_autoAI - P7 Extra T... / financial_risk_deploy

financial_risk_deploy Deployed Online

API reference **Test**

Enter input data

Gender
1

Married
0

Dependents
0

Education
11

Add to list +

Input list (1)

[1, 0, 1, 1, 0, 1530, 0, 500, 236, 1, 1, 1]

Predict (1)

Result

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➤ The Final Step is to build the node red application

Smartintenz - Your te x Student Dashboard x Application Details - I x Node-RED on IBM Clo x SI-3070-1623997296 x Financial risk manager x + -

node-red-vjsud-2021-07-03.eu-gb.mybluemix.net

Node-RED on IBM Cloud

Node-RED

Flow-based programming for the Internet of Things

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

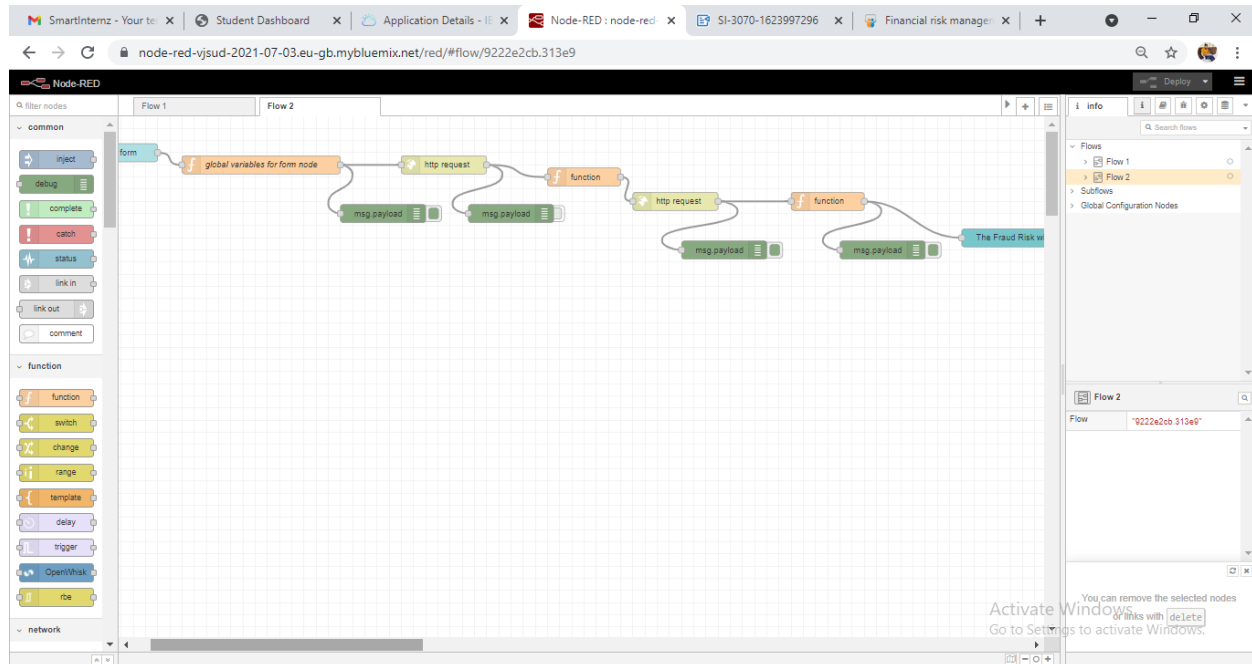
This instance is running as an IBM Cloud application, giving it access to the wide range of services available on the platform.

More information about Node-RED, including documentation, can be found at nodered.org.

[Go to your Node-RED flow editor](#)

[Learn how to customise Node-RED](#)

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5.RESULT

If we enter the values of Gender,married,dependents,etc then the model will predict the financial risk.

6.Advantages of Financial Risk Prediction

- Gain clarity on what is working and what is not working.
- Provide a solid groundwork for decision making.
- Assess financial risk.
- Build a strategic plan.
- Prepare for growth.
- Reach or build profitability.

7.Disadvantages of Financial Risk Prediction

- Can Create Catastrophic Result
- Long-Term Effects

- Cannot be Control

8.Conclusion

Therefore we can predict the fraud risk by using the IBM and Auto AI
Experiment

9.UI Output ScreenShot

Prediction

Enter the values

Gender *
1

Married *
1

Dependents *
1

Education *
1

Self_Employed *
1

ApplicantIncome *
4583

CoapplicantIncome *
1508

LoanAmount *
128

Loan_Term *
360

Credit_History_Available *
1

Loan_Status *

Activate Windows
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Prediction

Education *

1

Self_Employed *

1

ApplicantIncome *

4583

CoapplicantIncome *

1508

LoanAmount *

128

Loan_Term *

360

Credit_History_Available *

1

Housing *

1

Locality *

1

SUBMIT CANCEL

The Fraud Risk will be 1

Activate Windows
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10.Future Scope

The Financial Risk prediction model can be used anywhere by connecting through the internet

11.Bibliography

- Crockford, Neil (1986). *An Introduction to Risk Management (2nd ed.)*. Woodhead-Faulkner. ISBN 0-85941-332-2.
- Machina, Mark J., and Michael Rothschild (1987). "Risk," *The New Palgrave: A Dictionary of Economics*, v. 4, pp. 201–206.
- George Soros (2009). *The Crash of 2008 and What it Means: The New Paradigm for Financial Markets*