

Credit Card Approval Prediction Using IBM Watson Machine Learning

1 INTRODUCTION

1.1 Overview

This project aims to build a model that can give results on whether a financial institution can approve credit cards to its customer. This card approval decision by financial companies is done based on considering various reasons related to individuals varying from creditworthiness, loan and repayment history, and income standards. This model can help an institution to make a precise judgment on whether a card can be approved or denied for avoiding fraudulence that can impact financial companies with loss. Through the project work, tried to examine what are the keynote features or requirements considered for issuing a credit card to consumers by financial institutions by evaluating the existing data set from a machine learning repository through machine learning visualization and analysis techniques.

1.2 Purpose

Banking industries received so many applications for credit card request. Going through each request manually can be very time consuming, also prone to human errors. However, if we can use the historical data to build a model which can shortlist the candidates for approval that can be great.

2 LITERATURE SURVEY

2.1 Existing problem

In Current times, everything is completely changed as a digital attribute. One of those digitalized areas is cashless transaction activity. This is very common nowadays, and more people are inclined towards this as this reduces the risk of misplacing cash physically. So, many financial institutions are providing cashless means for their users like debit and credit cards. One of the most prominent options is a credit card. Most people rely on credit cards to perform their transaction activities as it is a very easy way of making their payments. The decisiveness by many financial institutions like national and private banks rely on consumer information like their basic info, living standards, salary, yearly and monthly returns, their current livelihood income source. All this info is reviewed for considering an application. This complete check and analysis can avoid bearing a lot of technical and non-technical losses to the institution.

This proper analysis is required as we see tremendous growth in this business sector to avoid any kind of potential risk related to the unethical consumer. precise verification needs to be incorporated by banks when granting credit card to the applicant. Even though decision-making differs from bank to bank, but the most common factor considered by financial institutions is the consumer's credit score. As we are seeing an increase in the large growth margin of the credit business of the financial institution due to more consumers interested in applying for credit cards, there is a need to completely automate the process in order to fasten the approval decision by banks. This helps the bank in improving business along with saving time and need of less manpower which is a major saving in terms of money. The replenishment of majority of raw materials is done on weekly basis and since the raw material is perishable, the procurement planning is of utmost importance. Secondly, staffing of the centers is also one area wherein accurate demand forecasts are really helpful. This is done through manual process.

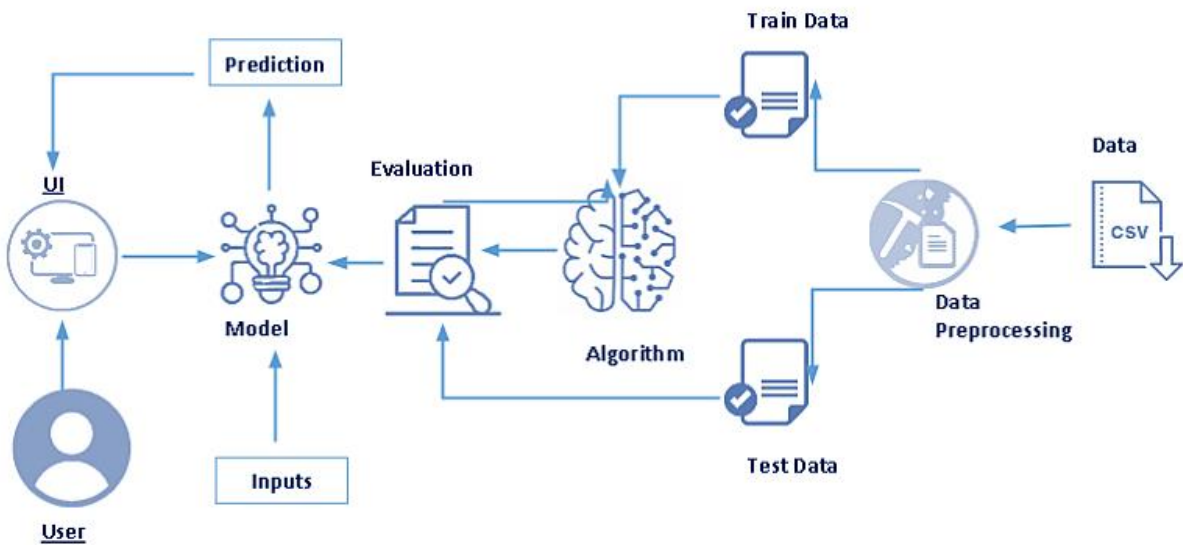
2.2 Proposed solution

It is the most rapidly evolving artificial intelligence application. It addresses how a computer or system can execute a task based on a series of text or data without human intervention. This reduces the workload for the people and supports more automation which can save time and money in the long run. We see an enormous amount of data is being tackled by the system in very few seconds and by incorporating machine learning techniques to this fast-paced system can help in building a model. Modeling can perform analysis on high standard and heavy multiplex data and predict the patterns.

It gives insight about risk and profits to any business model because machine learning is all about linking and associating data links and predicts relations among them which can be used while taking decisions for the future of the business model. Machine learning algorithms performs its task by recognizing the patterns of the data. The process of identifying patterns is done in two ways: supervised and unsupervised learning.

3 THEORITICAL ANALYSIS

3.1 Block diagram

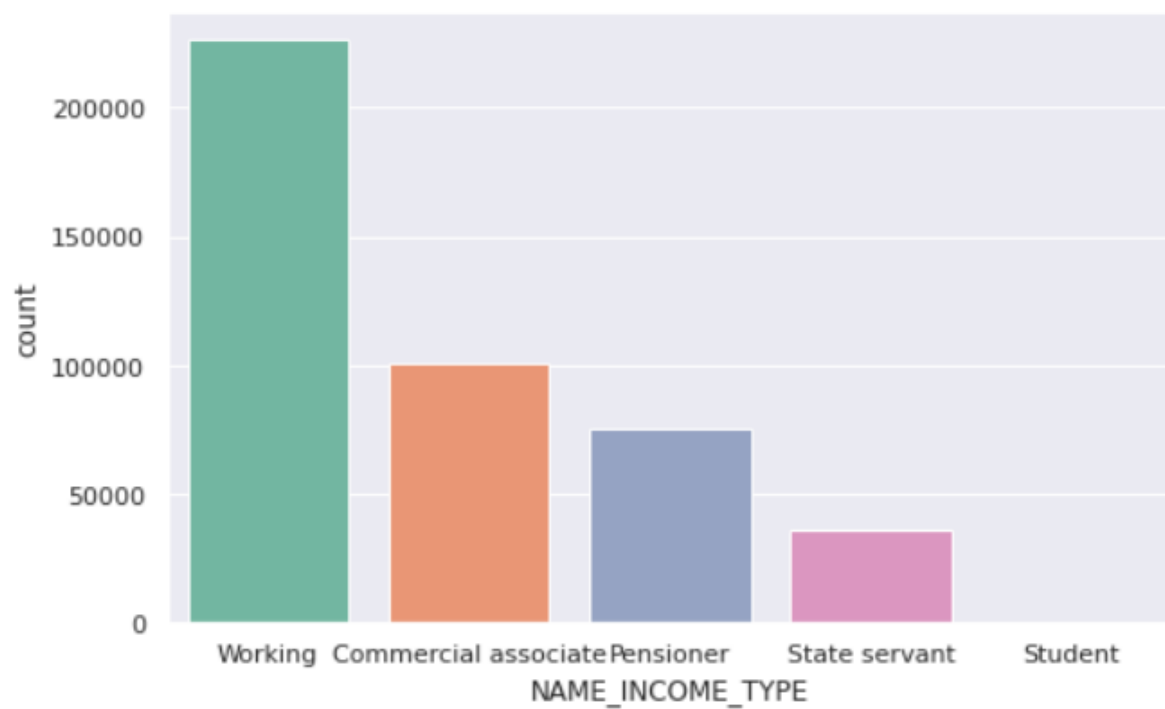
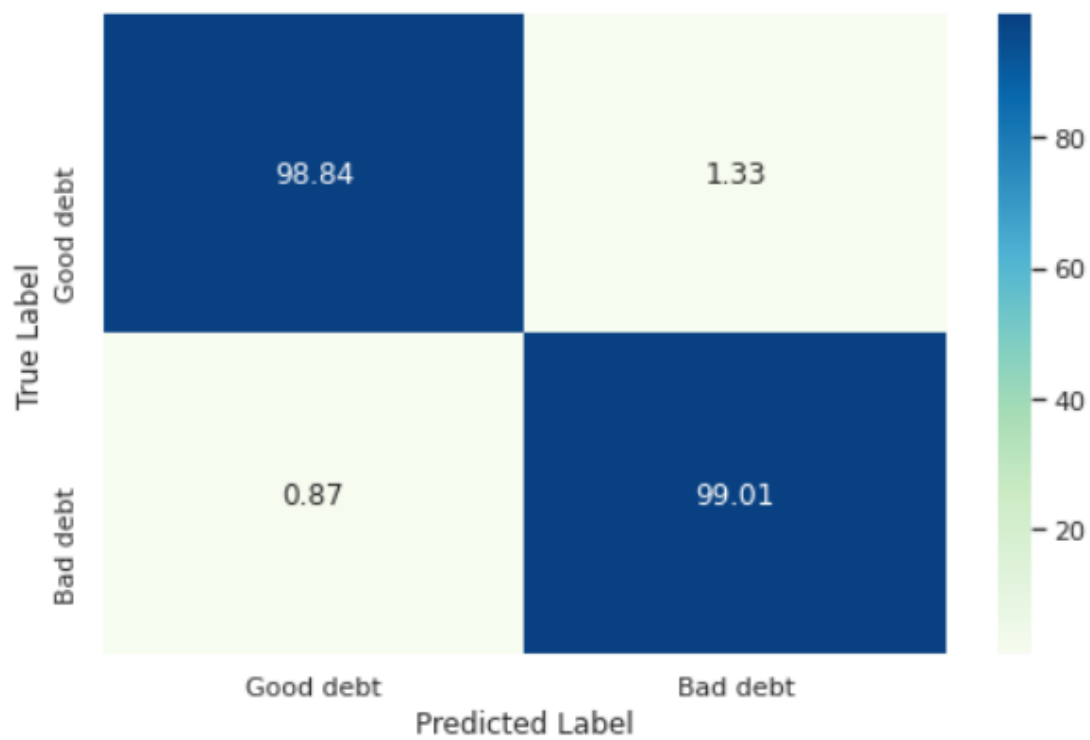


3.2 Hardware / Software designing

- Anaconda.
- Jupyter notebook.
- Spyder IDE.
- Numpy.
- Pandas.
- Matplotlib.
- Seaborn.
- Sklearn/Scikit-learn.
- Flask..

4 EXPERIMENTAL INVESTIGATIONS

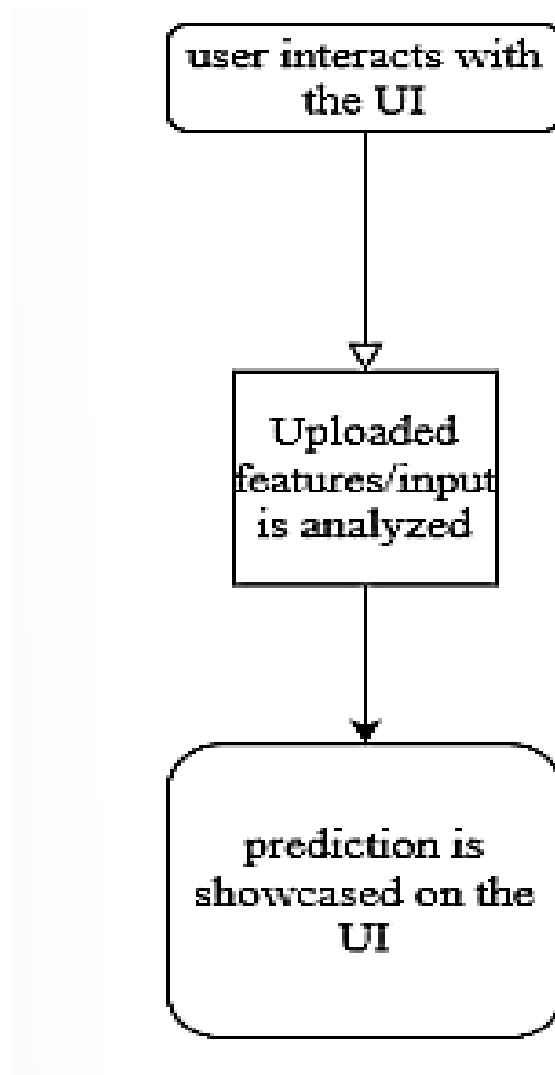
Here we are going to build a machine learning model that predicts loan approval prediction based on the following parameters



5 FLOWCHART

Project Work Flow:

- The user interacts with the UI (User Interface) to upload the input features.
- Uploaded features/input is analyzed by the model which is integrated.
- Once the model analyses the uploaded inputs, the prediction is showcased on the UI.



6 RESULT

Credit Card Approval Prediction

GENDER

MALE

OWN CAR OR NOT

YES

OWN REALSTATE

YES

TOTAL ANUAL INCOME

4005054

TYPE OF INCOME

Working

EDUCATION

Higher education

FAMILY STATUS

Married

TYPE OF HOUSING

House / apartment

DAYS BIRTH

25468

DAYS EMPLOYED

90

FAMILY MEMBERS

2

EMI PAID OFF

4

EMI OF PASTDUES

9

NUMBER OF LOANS

1

Predict

You are "**Eligible**" for credit card

7 ADVANTAGES & DISADVANTAGES

7.1 Advantages

- Helps reduce risks and make efficient financial decisions that impact profit margins
- cash flow
- opportunities for expansion
- Helps operating costs and overall spend

7.2 Disadvantages

- it will never always 100% accurate
- It can also be costly

8 APPLICATIONS

Nowadays, banks receive a lot of applications for issuance of credit cards. Many of them rejected for many reasons, like high-loan balances, low-income levels, or too many inquiries on an individual's credit report. Manually analyzing these applications is error-prone and a time-consuming process. Luckily, this task can be automated with the power of machine learning and pretty much every bank does so nowadays. In this project, we will be build an automatic credit card approval predictor using machine learning techniques, just like the real banks do.

9 CONCLUSION

While building this credit card approval predictor model, we tackled some of the most widely-known pre-processing steps such as scaling, label encoding, and missing value imputation. We finished with some machine learning model to predict if a person's application for a credit card would get approved or not given some information about that person.

10 FUTURE SCOPE

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11 BIBLIOGRAPHY

- <https://medium.datadriveninvestor.com/predicting-credit-card-approvals-using-ml-techniques-9cd8eae5b8c>
- <https://www.kaggle.com/datasets/rikdifos/credit-card-approval-prediction>

APPENDIX

a. Git hub link:

<https://github.com/smartinternz02/SI-GuidedProject-6806-1638867335/blob/main/Loan%20Aproval%20Prediction.zip>

b. Source Code:

```
# importing the necessary dependencies
from flask import Flask,request,render_template
import numpy as np
import pandas as pd
import pickle
import os

app=Flask(__name__)# initializing a flask app
#filepath="I:\SmartBridge Projects\Co2 emission\co2.pickle"
#model=pickle.load(open(co2.pickle,'rb'))

with open('model.pkl','rb') as handle:
    model = pickle.load(handle)

@app.route('/')# route to display the home page
def home():
    return render_template('index.html') #rendering the home page

@app.route('/Prediction',methods=['POST','GET'])
```



```

def prediction(): # route which will take you to the prediction page
    return render_template('index1.html')

@app.route('/Home',methods=['POST','GET'])
def my_home():
    return render_template('index.html')


@app.route('/predict',methods=["POST","GET"])# route to show the
predictions in a web UI
def predict():
    # reading the inputs given by the user
    input_feature=[float(x) for x in request.form.values() ]
    features_values=[np.array(input_feature)]

feature_name=['CODE_GENDER','FLAG_OWN_CAR','FLAG_OWN_REAL
TY','AMT_INCOME_TOTAL','NAME_INCOME_TYPE','NAME_EDUCATI
ON_TYPE','NAME_FAMILY_STATUS','NAME_HOUSING_TYPE','DAYS_
BIRTH','DAYS_EMPLOYED','CNT_FAM_MEMBERS','paid_off','#_of_pastd
ues','no_loan']

x=pd.DataFrame(features_values,columns=feature_name)

# predictions using the loaded model file
pred=model.predict(x)
print(pred)
if pred==0:
    prediction = "Eligible"
else:
    prediction = "Not Eligible"
#prediction="Prediction is:"+str(predic)
# showing the prediction results in a UI
return render_template("result.html",prediction=prediction)

```

```
if __name__=="__main__":  
    # app.run(host='0.0.0.0', port=8000,debug=True)    # running the app  
    port=int(os.environ.get('PORT',5000))  
    app.run(port=port,debug=False,use_reloader=False)
```