

GROUP MEMBERS:**KUNAL KUMBHARE (120A3024)****MAYANK RAJ (120A3026)****ADITI NAIR (120A3030)****SHREYA IDATE (120A3051)****MOBILE APPLICATION TO PREDICT COMPANY BANKRUPTCY****Description:**

Bankruptcy is the legal status of a person or other entity that cannot repay debts to creditors. Bankruptcy offers an individual or business a chance to start fresh by forgiving debts that simply cannot be paid, while offering creditors a chance to obtain some measure of repayment based on the individual's or business' assets available for liquidation. Bankruptcy prediction is the art of predicting bankruptcy and various measures of financial distress of public firms.

Our project titled ‘MOBILE APPLICATION TO PREDICT COMPANY BANKRUPTCY’ has been developed using Flutter and the Random Forest Machine Learning Algorithm to predict if a company will go bankrupt in the coming year based on its current financial ratios. The project considers 18 essential parameters (financial ratios) such as Operating Gross Margin, Asset Growth Rate, Net Profit (before and after taxes), Revenue Per Share and so on to conclude whether the company will go bankrupt.

We also provide login functionality to each company registered with us to maintain their confidentiality.

The following technologies have been implemented in this project:

- Flutter
- Python
- Machine Learning
- Flask
- Firebase

GitHub links to the project codebase:**Mobile App**

<https://github.com/SEM6-Mini-Project/app.git>

API

<https://github.com/SEM6-Mini-Project/Api.git>

API using Flask

```
import numpy as np
from flask import Flask, request, jsonify, render_template
import pickle

# Create flask app
flask_app = Flask(__name__)
model = pickle.load(open("model.pkl", "rb"))

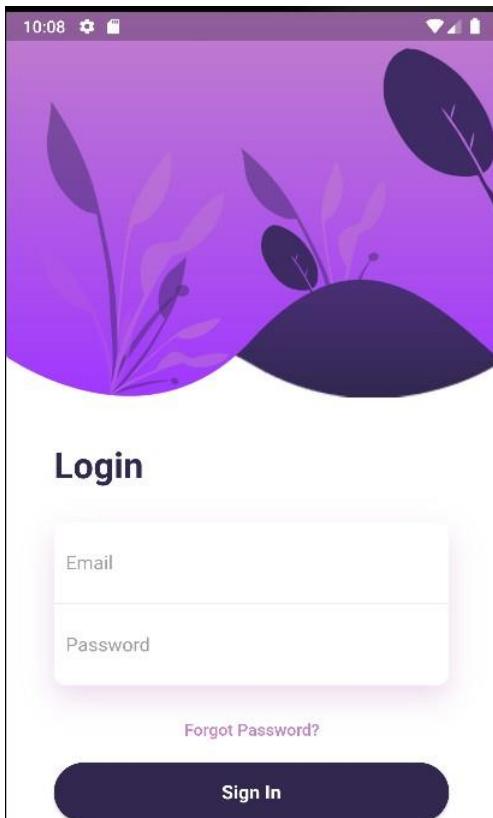
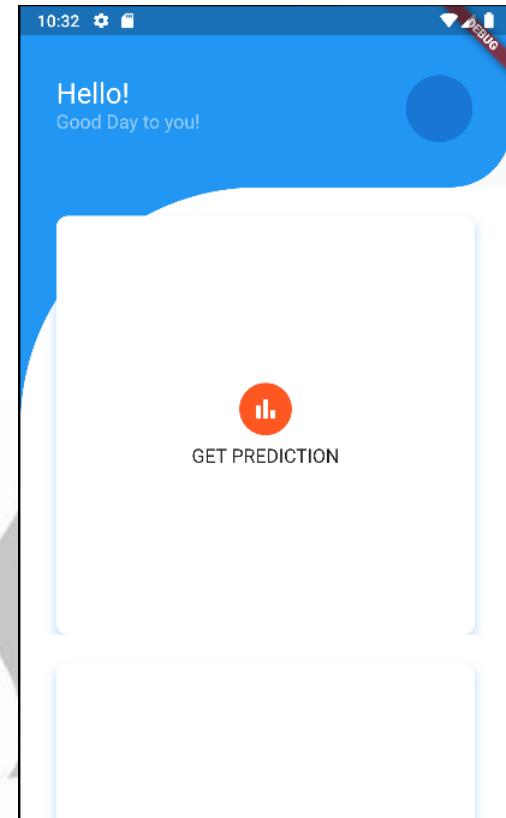
@flask_app.route("/")
def Home():
    return render_template("index.html")

@flask_app.route('/predict', methods=['POST'])
# def predict():
#     float_features = [float(x) for x in request.form.values()]
#     print("Float features:", float_features)
#     features = [np.array(float_features)]
#     print("Features:", features)
#     prediction = model.predict(features)
#     print("Prediction:", prediction)
#     return render_template("index.html", prediction_text="The Company Bankruptcy prediction
is {}".format(prediction))

def predict():
    data = request.get_json()
    input_data = [
        float(data['input_1']),
        float(data['input_2']),
        float(data['input_3']),
        float(data['input_4']),
        float(data['input_5']),
        float(data['input_6']),
        float(data['input_7']),
        float(data['input_8']),
        float(data['input_9']),
        float(data['input_10']),
        float(data['input_11']),
        float(data['input_12']),
        float(data['input_13']),
        float(data['input_14']),
        float(data['input_15']),
        float(data['input_16']),
        float(data['input_17']),
        float(data['input_18'])]
]
```

```
print("Input data:", input_data)
features = [np.array(input_data)]
print(features)
prediction = model.predict(features)
print("Prediction:", prediction)
if prediction[0]==0:
    prediction_text="The company will not go Bankrupt"
else:
    prediction_text="The company has a high chance of going bankrupt"
response = {'prediction': prediction_text}
print("Response:", response)
return jsonify(response)

if __name__ == "__main__":
    flask_app.run(debug=True)
```

Screenshots:**Login Screen****Dashboard**

Prediction Page

On input, the following prediction is achieved:

The image displays two side-by-side screenshots of a mobile application interface titled "Prediction". Both screens show a list of input fields with placeholder values. The left screen shows fields for Operating Gross Margin (10), Realized Sales Gross Margin (10), Operating Profit Rate (10), Pre-tax net Interest Rate (10), After-tax net Interest Rate (10), Continuous interest rate (10), Operating Expense Rate (10), and Cash flow rate (10). The right screen shows fields for Operating Profit Per Share (10), Operating Profit Growth Rate (10), After-tax Net Profit Growth Rate (10), Regular Net Profit Growth Rate (10), Continuous Net Profit Growth Rate (10), Total Asset Growth Rate (10), and a "Get Prediction" button. Below the right screen, the prediction result is displayed: "Prediction: The company will not go Bankrupt".

Input Field	Value
Operating Gross Margin	10
Realized Sales Gross Margin	10
Operating Profit Rate	10
Pre-tax net Interest Rate	10
After-tax net Interest Rate	10
Continuous interest rate	10
Operating Expense Rate	10
Cash flow rate	10
Operating Profit Per Share	10
Operating Profit Growth Rate	10
After-tax Net Profit Growth Rate	10
Regular Net Profit Growth Rate	10
Continuous Net Profit Growth Rate	10
Total Asset Growth Rate	10

References:

- [1] Evidence of Predicting Early Signs of Corporate Bankruptcy Using Financial Ratios in the Indian Landscape, Abhi Bansal, Adit Chopra, Aryaman Wadhwa, Shaheed Sukhdev College of Business Studies, University of Delhi
- [2] Comparative Analysis of Bankruptcy Prediction Models: An Indian Perspective, Dr. Sandeepa Kaur
- [3] Predicting bankruptcy using Machine Learning, Vikram Devatha & Devashish Dhiman
- [4] Review of bankruptcy prediction using machine learning and deep learning techniques, Yi Qua, Pei Quan, Minglong Lei, Yong Shi