# TEAM NUMBER 8

Team Details:

We are a trio of final-year computer engineering students, united by our passion for harnessing technology to create meaningful change. Let us introduce ourselves:

	Krishna Laturiya *adept at navigating challenges and delivering results*	**Mitali Majalgaonkar** *always eager to embark on new, innovative ventures*	**Sneha Naik** *known for combining hard work with smart strategies*
Tech expertise	C#, Python, Java, Cloud Computing, Machine Learning, Android App Development, Web Development, Data Structures and Algorithms	Data Structures, Problem Solving, OOPS, DBMS, OS, Machine Learning, Java, HTML, CSS	Database Management, Android Development, Data Structures and Algorithms, Java, Web Development, Machine Learning
Internship Experience	Microsoft	Citi	Deutsche Bank
Co-curricular	● Code for good hackathon by JPMC ● BMC hackathon	● Kleos hackathon	● Citibridge program ● Microsoft Learn Student Ambassador
Hobbies	Badminton, Traveling	Singing , Sports	Swimming , Playing guitar

Theme Chosen: ML-based fraud detection system

Amidst the rapid shift to cashless transactions and the escalating instances of online payment scams, we recognized the pressing need for change. This realization led to our endeavor: developing an Online Payment Fraud Detection System. Our contribution to safeguard individuals from fraudulent activities, ensuring secure and trustworthy online transactions for all.

Web app development: Web Application Development for Fraud Detection: Enhancing Security
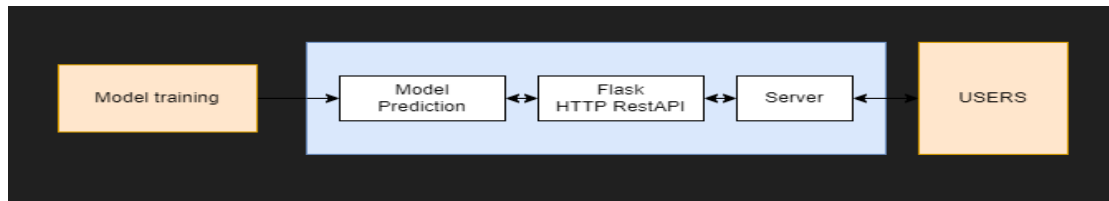
- **Dataset Selection:**
  In our pursuit of building an effective fraud detection system, we meticulously chose a dataset that aligns perfectly with our objectives. We emphasized the significance of an adequate number of features and rows, ensuring the dataset's suitability for precise fraud identification.
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- **Data Pre-processing:**
  We understood that clean data is paramount for accurate results. Thus, our team dedicated time to preprocess the dataset, making necessary modifications to tailor it to our use-case. We diligently removed null and invalid values, leaving us with a refined foundation to build upon.

- **Model Building and Evaluation:**
  To unearth the best possible solution, we delved into model building using various machine learning classifiers. We harnessed the power of Random Forest Classifier, Support Vector Classifier (SVC), XGBoost (Extreme Gradient Boosting), and Decision Tree Classifier. This multipronged approach provided us with an insightful understanding of our data's behavior, enabling us to select the most appropriate model.

- **Model Comparison and Selection:**
  With meticulous care, we compared the performance of each model. We assessed training and test accuracies alongside precision matrices to make informed decisions. Our rigorous evaluation revealed that the Random Forest Classifier emerged as the champion, boasting an impressive training accuracy of 0.99 and an impeccable test accuracy of 1.

- **User Interface Development:**
  The user experience was paramount in our endeavor. We meticulously crafted HTML and CSS webpages, offering an intuitive and engaging platform. Our interface seamlessly takes user input and presents the prediction, ensuring a smooth and interactive experience.

- **Backend-Frontend Synergy:**
  The bridge between our backend and frontend was established through a robust connection. We created a pkl (Python Pickle) file to encapsulate our trained model and deployed it using Flask. This orchestration culminated in a working prototype of our fraud detection system.

Project Working

On running the project, users would be redirected to the home page of our web-app from where they can go to the "about us" page or to the "prediction page".The first would give a brief about our system and the latter routes them to a prediction page where they can enter the transaction details and find out whether or not the transaction is fraudulent.

The development tools,API, libraries

- Flask, Google collab, VS Code, Postman API
- Numpy,pandas ,matplotlib.pyplot,seaborn,scipy ,sklearn,xgboost,pickle