**Presentation**

**Now let us see how we are going to Detection Fraud using ml algo**

With the increasing availability of advanced technologies, the banking industry faces a growing threat from fraudsters. As fraud patterns evolve due to inconsistencies in banking systems, the importance of robust fraud detection methods cannot be ignored. Detecting fraud requires a valuable dataset and a high-performance machine learning algorithm.

**lets begin with approach breakdown for fraud detection**

1. We start by conducting EDA on the dataset to understand its features.
2. We analyze the distribution of legitimate and fraudulent transactions.
3. Legitimate and fraudulent transactions are separated into two variables.
4. As our dataset may have an unequal distribution of fraud and legitimate transactions, we balance the data to ensure unbiased model training. and
5. Balanced data is merged into a new dataframe. From new dataframe
6. We have splited the data into features and the target variable. after that
7. dataset is split into training (80%) and testing (20%) sets. After splitting data into training and testing
8. We explore various machine learning models commonly used for classification tasks,which including Decision Trees, K-Nearest Neighbors (KNN), Gaussian Naive Bayes (GNB), Logistic Regression (LogReg), and Support Vector Machines (SVM).
9. The selected models are trained using the training data. After that
10. We evaluate the performance of each model.
11. by measure the accuracy of the models on the training data as well as testing data. As you can see in table
12. The Decision Tree model demonstrates remarkable accuracy during our evaluation.
13. Based on our evaluation results, we confidently select the Decision Tree model as our primary tool for fraud detection. Which can be used by bank to detect the fraud in the future.

**Benefits:**

1. **Early Detection of Fraudulent Activities:** Utilizing advanced machine learning algorithms enables our system to detect fraudulent transactions early, enabling timely action to mitigate potential risks.
2. **Improved Decision-Making for Fraud Prevention:** Our fraud detection models provide valuable insights that can be used by institute to block fraudulent merchants to prevent future fraudulent activities. And that will help in
3. **Reduction in Financial Losses:** By identifying and preventing fraudulent transactions in a timely manner, financial institutions can minimize the financial losses associated with fraudulent activities.
4. **Enhancement of Customer Trust:** Safeguarding customers' financial assets and personal info institute can builds trust and confidence among customers, strengthening their relationship with the institution.

**Challenges:**

1. **Integration of Data from Diverse Sources:** During the hunt for a suitable dataset, we were unable to find a single dataset that fully satisfies our requirements. Therefore, we have decided to select two datasets and merge them together to fulfil our needs for this Project.
2. **Keeping Up with Rapidly Evolving Fraud Tactics:** Fraudsters coming up with new tactics, so it is important to continuous updating our model.
3. **Handling Large Volumes of Data Efficiently:**   
   Effectively processing large volumes of data is crucial to ensure that inconsistencies are minimized within the dataset.
4. **Ensuring Accuracy and Reliability of Detection Algorithms:** Developing accurate and reliable fraud detection algorithms with good accuracy.
5. **Addressing False Positives and Negatives:**

Now Saksham will continue with case study.