AI/ML Crash Notes & Credit Card Fraud Detection Project

This document contains essential crash notes for Python, AI/ML fundamentals, key libraries, and a breakdown of a real-world project: Credit Card Fraud Detection using Random Forest.

Day 1: Python Basics

- Variables, Data Types, Loops (for, while), Conditionals (if-else), Functions
- Lists, Dictionaries, Tuples, File Handling (read/write files)
- Practice platforms: W3Schools, HackerRank

Day 2: Pandas & NumPy

- NumPy: Efficient numerical computations with arrays
- Pandas: DataFrames for structured data
- Operations: .read_csv(), .head(), .info(), .describe(), .dropna()
- Use case: Explore credit card dataset

Day 3: ML & Random Forest

- Supervised vs Unsupervised Learning
- ML Flow: Load Data -> Preprocess -> Train/Test Split -> Train Model -> Predict -> Evaluate
- Random Forest: Ensemble of decision trees, handles overfitting well
- Metrics: Accuracy, Precision, Recall, F1-Score

Day 4: Streamlit Frontend

- Streamlit: Python framework for creating ML web apps easily
- Create form with inputs (Time, V1-V28, Amount)
- Load model using pickle, predict with model.predict()

- Show result as 'Fraud' or 'Not Fraud'

Day 5: Project Summary

Credit Card Fraud Detection using Random Forest:

- Dataset: Online Kaggle dataset with anonymized features (V1 to V28)

- Goal: Predict whether a transaction is fraudulent

- Approach: Data preprocessing -> Model training -> Evaluation -> Streamlit UI

- Tools: Python, Pandas, Scikit-learn, Streamlit, Pickle