Date	7th November 2024
Team ID	SWTID1727321147
Project Name	Time Series Analysis For Bitcoin Price Prediction using Prophet
Minimum Marks	3 Marks

Project Proposal (Proposed Solution) Template

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview

- **Objective:**
  The objective of this project is to create a time series forecasting model to predict Bitcoin prices using Facebook's Prophet model. By analyzing historical Bitcoin price data, the project aims to provide accurate price forecasts, helping traders and investors make informed decisions in volatile cryptocurrency markets.

- **Scope:**
  The scope of the project involves collecting historical Bitcoin price data, preprocessing the data, and applying time series forecasting using Prophet. The analysis will focus on daily price trends and fluctuations. The model will consider market trends, external factors, and seasonal patterns to provide accurate forecasts. The model will be evaluated using performance metrics like Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE). Continuous updates with new data and additional features such as trading volume and market sentiment analysis will also be considered.

Problem Statement

- **Description:**
  Build a time series prediction model for Bitcoin price forecasting using Prophet. The unpredictable and volatile nature of Bitcoin makes it challenging for traders and investors to anticipate price movements. This model aims to reduce risks by providing accurate short-term and long-term predictions based on historical price data and market trends.

- **Impact:**
  The system will help investors and traders in the cryptocurrency market by providing accurate price predictions. This will reduce uncertainty and support better decision-making, ultimately leading to more secure trading and investment strategies. The model's ability to continuously update with new data will ensure its relevance and adaptability to market changes.

Proposed Solution

- **Approach:**
  Employing time series analysis using Prophet, a forecasting tool that handles missing data and outliers, detects trends, and adjusts for seasonality. The solution will be built on historical Bitcoin price data, which will be cleaned, processed, and fed into the Prophet model to generate forecasts for future prices.
- **Key Features:**
    - **Implementation of Prophet-based Model:** A time series forecasting model will be created using Prophet to predict Bitcoin prices based on historical data.
    - **Handling Seasonality and Trend:** Prophet's ability to capture weekly and yearly seasonality and long-term market trends will enhance prediction accuracy.
    - **Regular Updates:** The model will continuously update with new data and provide forecasts based on the latest market trends.
    - **User-Friendly Interface:** The predictions can be visualized in an easy-to-interpret format, providing users with insights into potential price movements.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware	Computing Resources	CPU/GPU specifications for training the model.
	Memory	At least 16 GB RAM for handling large datasets.
	Storage	1 TB SSD for storing datasets, trained models, and logs.
Software	Frameworks	Python with Flask for deployment.
	Libraries	Prophet, pandas, numpy, matplotlib for time series analysis and visualization.
Development Environment	IDE, version control	Jupyter Notebook for model development, Git for version control.
Data	Data Source, size, format	Bitcoin historical price data from public APIs (e.g., CoinMarketCap, Yahoo Finance), CSV format.