Project Design Phase-I
Solution Architecture

Date	15 November 2023
Team ID	Team-591961
Project Name	Project - Time Series Analysis For Bitcoin Price Prediction Using Prophet
Maximum Marks	4 Marks

Solution Architecture:

Problem Statement:

The business problem is predicting Bitcoin prices to assist investors, traders, or financial analysts in making informed decisions.

Proposed Tech Solution:

Facebook Prophet is chosen for its ability to handle time series data, ease of use, and good performance in forecasting tasks.

Structure:

The solution comprises data collection, preprocessing, model training, and prediction components.

Characteristics:

Utilizes Facebook Prophet, an open-source forecasting tool.

Integrates with data sources providing historical Bitcoin price data.

Behavior:

The software ingests historical data, preprocesses it for model training, uses the Prophet model for forecasting, and provides predictions for future Bitcoin prices.

Other Aspects:

Incorporates visualization components to present historical and predicted price data.

Can be deployed as a standalone application or integrated into existing financial platforms.

Features:

Historical data collection from cryptocurrency exchanges.

Data preprocessing for handling missing values, outliers, and ensuring compatibility with Prophet.

Training the Prophet model on historical data.

Generating predictions for future Bitcoin prices.

Visualization of historical and predicted data.

Development Phases:

Data Collection and Preprocessing:

Develop data collection scripts to fetch historical Bitcoin price data.

Implement preprocessing steps to clean and format the data.

Model Training:

Utilize Facebook Prophet to train a time series forecasting model.

Prediction:

Develop components to generate predictions using the trained model.

Visualization:

Implement visualization features to present historical and predicted data.

Solution Requirements:

Access to historical Bitcoin price data.

Compatibility with Facebook Prophet library.

Integration capabilities with other financial tools if needed.

Scalability to handle large datasets.

Specifications:

The solution should be compatible with Python, as Facebook Prophet is implemented in Python.

Use version control for code management (e.g., Git).

Ensure documentation for data preprocessing steps, model training, and deployment procedures.

Implement continuous integration and deployment (CI/CD) practices for efficient updates.

Management:

Agile development methodology with sprints and regular feedback loops.

Regular updates to stakeholders during development phases.

Delivery:

Release cycles with versioned updates.

Deployment on cloud infrastructure for scalability and accessibility.

Solution Architecture Diagram: