

# Infosys Springboard Virtual Internship 6.0

## Completion Report

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### Team Details

Batch Number 1

Start date: 13 August 2025

Name: Shreya Sharma

Internship Duration: 8 Weeks

### 1. Project Title

CryptoPulse: Machine Learning-Based Crypto Price Prediction

### 2. Project Objective

1. The Cryptocurrency Price Prediction Using Machine Learning project aims to forecast future cryptocurrency prices using time-series modeling. The system preprocesses historical data, trains predictive models, and visualizes results to provide insights into upcoming price movements.
2. The outcome is a system capable of accurately predicting cryptocurrency price trends. By analyzing historical data and visualizing predicted values, it helps users make more informed investment decisions in the volatile cryptocurrency market.

### 3. Project description in detail

The Cryptocurrency Price Prediction Using Machine Learning project is designed to forecast future cryptocurrency prices by leveraging historical data and advanced machine learning techniques. Given the high volatility of assets such as Bitcoin and Ethereum, predicting price movements is challenging. To address this, the project employs time-series forecasting with Long Short-Term Memory (LSTM) neural networks, which effectively capture sequential patterns in historical data to predict future trends.

The system collects and preprocesses cryptocurrency price data, handling missing values and applying feature scaling to improve model accuracy. The trained LSTM model generates predictions that are then served through a Flask backend, connected to a user-friendly web interface built with HTML, CSS, and JavaScript. Users can choose a cryptocurrency, set a date range, and visualize predictions via interactive charts. This end-to-end setup makes predictions **accessible, interpretable, and actionable**, enabling users to make more informed investment and trading decisions.

## 4. Timeline Overview

Week	Activities Planned	Activities Completed
Week 1	Internship kick-off, sessions on ChatGPT, Project Description.	Set up the project environment and refreshed knowledge of all required technologies for the project.
Week 2	Data collection through APIs.	Collected historical cryptocurrency data from Binance and Coindesk. Completed Milestone 1.
Week 3	Clean the collected data and remove unusual or inconsistent entries.	Cleaned the data and saved it in CSV files for further processing.
Week 4	Train the LSTM models for all coins on hourly and daily data.	Trained the models and evaluated their performance using MAE, MSE, and $R^2$ metrics.
Week 5	Develop the User Interface (UI) for the project.	Designed and implemented the UI of the web application.
Week 6	Connect backend and frontend to make the website functional for predictions.	Integrated the frontend with the Flask backend, enabling real-time price predictions.
Week 7	Develop dashboard features.	Created the prediction history page in the dashboard for tracking past predictions.
Week 8	Final testing, documentation, and preparation for report and presentation.	Completed testing, compiled all documentation, and prepared the demo for submission.

### 5a. Key Milestones

Milestone	Description	Date Achieved
Project Kickoff	Initial setup of the internship, discussion of project description, and technology brush-up.	13–19 August 2025
Prototype/First Draft	Completion of Milestone 1 & 2: data collection, cleaning, and initial model training.	26 August – 9 September 2025
Mid-Term Review	Completion of Milestone 3: model training, evaluation, and preliminary results presented.	23 September 2025
Final Submission	Completion of Milestone 4: backend-frontend integration, dashboard development, testing, and documentation.	7 October 2025
Presentation	Demonstration of the project outcomes and submission to mentor.	3 October 2025

### 5b. Project execution details

The project was executed in iterative weekly sprints, ensuring steady progress and timely reviews. Key execution highlights include:

- Requirement Analysis & Technology Selection: Initiated with detailed requirement gathering and finalization of the technology stack, including Python (Flask) for backend, SQLite for database, and HTML, CSS, JavaScript for frontend.
- Backend & Database Development: Implemented secure APIs, set up database schemas, and established backend workflows to support prediction storage and retrieval.
- Machine Learning Integration: Trained and deployed LSTM models for five cryptocurrencies, achieving reliable prediction outputs integrated with the backend.
- Frontend Development: Designed and developed a responsive user interface with HTML, CSS, and JavaScript, seamlessly connected to backend APIs.
- User Authentication & History Management: Implemented secure login with per-user authentication and personalized prediction history tracking.

- **API Integration & Data Handling:** Incorporated external Binance and Yahoo Finance APIs to fetch real-time and historical data. Developed robust error-handling and failover mechanisms to ensure resilience during API downtime.
- **Testing & Iteration:** Conducted regular testing cycles in weekly sprints to identify and resolve bugs, ensuring stability and performance.
- **Documentation & Maintainability:** Prepared detailed documentation covering REST API endpoints, configurations, and user flows for future scalability.
- **User-Centric Enhancements:** Added timezone conversion logic to provide accurate, personalized prediction histories across regions.

## 6. Snapshots / Screenshots


Dashboard:

The screenshot displays the 'CryptoPulse' dashboard. At the top, the logo 'CryptoPulse' is on the left, and 'Welcome, testuser3!' with a 'Logout' button is on the right. The main heading is 'Cryptocurrency Price Prediction', followed by the instruction 'Select a cryptocurrency and prediction timeframe to get AI-powered market insights'. Below this is a 'Select Cryptocurrency' section with a grid of eight options: Bitcoin (BTC), Ethereum (ETH), Binance Coin (BNB), Dogecoin (DOGE), Polkadot (DOT), Solana (SOL), Ripple (XRP), and Tron (TRX). Bitcoin is selected, indicated by a checkmark. The 'Prediction Timeframe' section has two radio buttons: 'Daily Basis' and 'Hourly Basis', with 'Hourly Basis' selected. Below the radio buttons is a 'Hours' dropdown menu set to '16'. At the bottom, there are two buttons: 'Predict Now' (purple) and 'View Prediction History' (white).

Landing Page 1

CryptoPulse

tracks the heartbeat of the market



Track the Heartbeat of Crypto Markets

Advanced AI-powered cryptocurrency price predictions. Make informed trading decisions with real-time market analysis and trend forecasting.

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Bitcoin

₹36,00,000

+2.4%

Ethereum

₹2,20,000

-1.2%

Solana


₹8,200

+5.7%


Landing Page 2

CryptoPulse

tracks the heartbeat of the market




Why Choose CryptoPulse?




AI-Powered Predictions

Advanced machine learning algorithms analyze market patterns to provide accurate price forecasts.



Real-Time Analysis

Get instant market insights with live data processing and trend identification.



Precision Trading


Make informed decisions with detailed high/low predictions and market direction indicators.

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## Login Page

**CryptoPulse**  
*tracks the heartbeat of the market*



## Welcome Back

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**Email Address**

**Password**

**Sign In**

Don't have an account? [Sign up here](#)

## Track Market Trends

Get real-time insights and AI-powered predictions for your favorite cryptocurrencies.


**8+**  
Cryptocurrencies

**24/7**  
Market Analysis

**AI**  
Powered Predictions

## Sign Up Page

**CryptoPulse**  
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## Join CryptoPulse

Create your account to start tracking crypto trends

**Full Name**

**Email Address**

**Password**


**Confirm Password**


**Create Account**


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## Start Your Journey

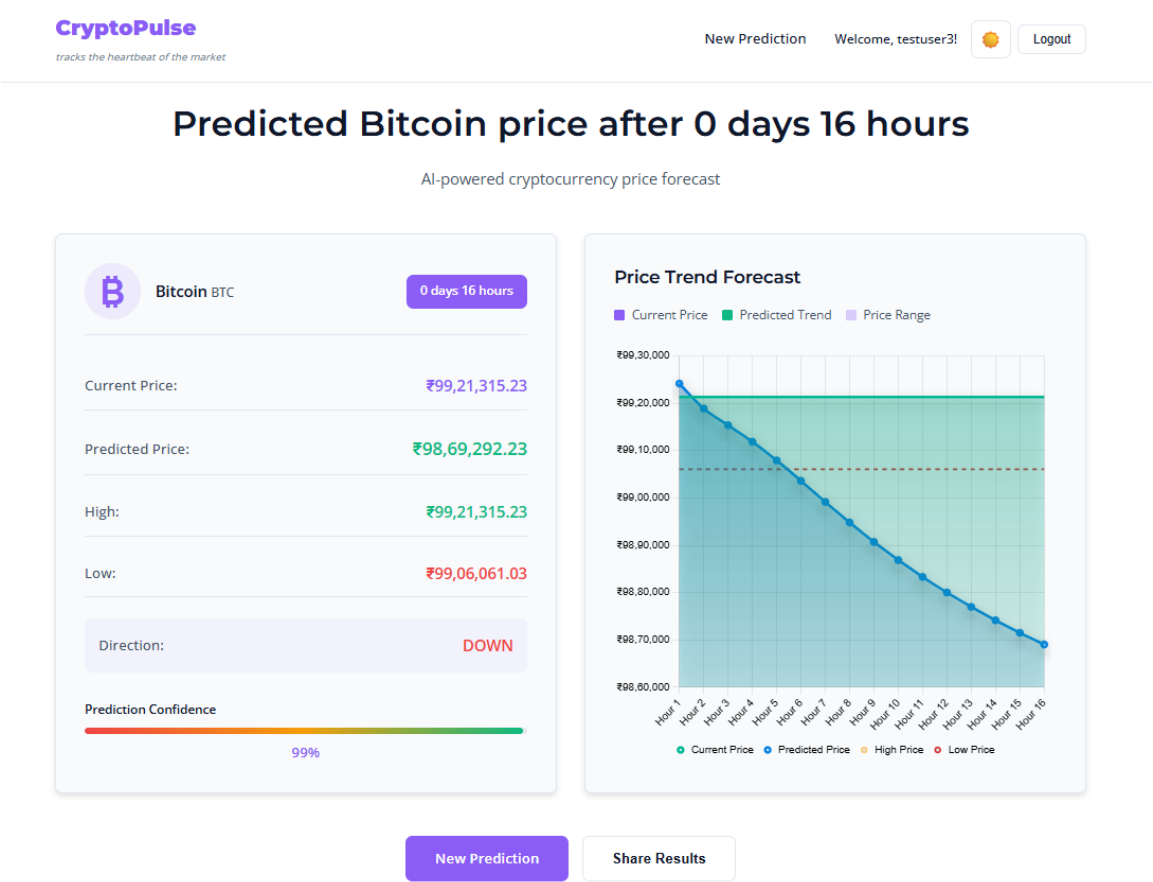
Join thousands of traders using AI-powered insights to make smarter investment decisions.

 Real-time Price Tracking

 AI Prediction Engine

 Advanced Analytics

Predicted Output



## 7. Challenges Faced

- **Data Quality Issues:** Raw data from Binance and Coindesk APIs often contained missing or inconsistent values, requiring extensive preprocessing and cleaning.
- **Model Training Complexity:** Achieving stable performance with LSTM models for both hourly and daily predictions was challenging due to high volatility and noise in cryptocurrency prices.
- **API Downtime & Rate Limits:** Frequent rate limits and occasional downtime from external APIs disrupted the data pipeline, necessitating retry logic and failover mechanisms.
- **Integration Hurdles:** Linking machine learning models with the Flask backend and ensuring seamless communication with the frontend required multiple iterations.
- **Time Management:** Balancing weekly milestones, testing cycles, and documentation within the internship timeline was challenging and demanded effective coordination.

## 8. Learnings & Skills Acquired

- Gained hands-on experience with Flask, HTML, CSS, JavaScript, and SQLite/MySQL.
- Built and trained LSTM models for cryptocurrency price prediction.
- Learned API integration with Binance and Yahoo Finance for real-time & historical data.
- Improved skills in data preprocessing, error handling, and debugging.
- Strengthened teamwork, communication, and time management through group collaboration.
- Acquired domain knowledge of cryptocurrency market trends and time-series forecasting.

## 9. Testimonials from team

Our internship journey was a great learning experience where we gained hands-on exposure to Flask, LSTM, and web development. The mentors were very supportive and our teammates cooperative, which made the project execution smooth. Overall, it was a rewarding and collaborative experience

## 10. Conclusion

The Virtual Internship 6.0 provided an excellent opportunity to bridge academic learning with real-world application. Through the Cryptocurrency Price Prediction project, we gained practical exposure to machine learning, API integration, and full-stack development while strengthening teamwork and problem-solving skills. The experience not only enhanced our technical expertise but also improved our professional collaboration and time management. Overall, this internship has been highly impactful and aligns closely with our academic growth and future career aspirations in software development and data science.



## 11. Acknowledgements

I would like to express my sincere gratitude to **Infosys Springboard** for providing me the opportunity to work on this internship. I am deeply thankful to my **mentor**, whose guidance, support, and valuable insights greatly contributed to the successful execution of this project. I would also like to thank my **teammates**, whose cooperation, collaboration, and encouragement made this group project a smooth and rewarding experience. This internship has been an enriching learning journey, and I am grateful to everyone who supported me throughout.