

EVALUATION OF BITCOIN.

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DS 2500 presentation

WHAT IS BITCOIN?

- Decentralized nature - no third party involved
- Blockchain technology
 - Transparency
 - Immutability
 - Security
- Disrupts traditional finance - digital finance
- Promotes financial access for all - everyone have equal access
- Enables global transactions - global platform



COLLEGE STUDENT

Over **20%** of US college students possess Bitcoin, underscores the widespread interest in cryptocurrency within our peer group. Our focus on Bitcoin extends to understanding its price dynamics and market trends. We aim to analyze general trends in Bitcoin prices to gain valuable insights into its role as a digital asset and its potential impact on the broader financial landscape. **Cryptocurrency exchange platforms**, like **Binance**, **Coinbase**, and **Kraken**, play a crucial role in facilitating investment and access by offering crucial infrastructure for market participants.



INTRODUCTION

WHY BITCOIN?

Financial Opportunities: By identifying trends and patterns in Bitcoin price movements, individuals (such as college students) can make informed decisions about buying, selling, or holding Bitcoin assets.

Market Insights: Conducting research on Bitcoin price prediction provides valuable insights into the dynamics of cryptocurrency markets.



FACTORS

- **Supply:** As more people buy and utilize Bitcoin for various purposes, its price is driving up.
- **Demand:** The limited supply of Bitcoin, with a maximum cap of 21 million coins, reduces the creation of new Bitcoins every four years.
- **Bitcoin adoption:** The ability to use Bitcoin for purchasing goods and services adds a practical dimension to its value.
- **Risks and investing consideration**
- **Legal regulations:** Bitcoin is banned in some countries.



DATASET

BITCOIN USD (BTC-USD) PRICE HISTORY & HISTORICAL DATA - YAHOO! FINANCE

- **Source:** Yahoo! Finance - a media property that is part of the Yahoo! network.
- Record of Bitcoin's price changes from 2014 to today.
- **Concern?** Excessive or unauthorized data scraping



RESULTS

LINEAR
REGRESSION

POLYNOMIAL
REGRESSION

LINEAR REGRESSION MODEL



PREDICTIONS

```
# predicted price for using the halve_1 period  
predict('2024-04-20', halve1_sec)
```

'The predicted price for the given period: 1435.51\$'

```
# predicted price for using the halve_2 period  
predict('2024-04-20', halve2_sec)
```

'The predicted price for the given period: 18086.81\$'

```
# predicted price for using the next_halve period  
predict('2024-04-20', next_halve_sec)
```

'The predicted price for the given period: 34186.39\$'



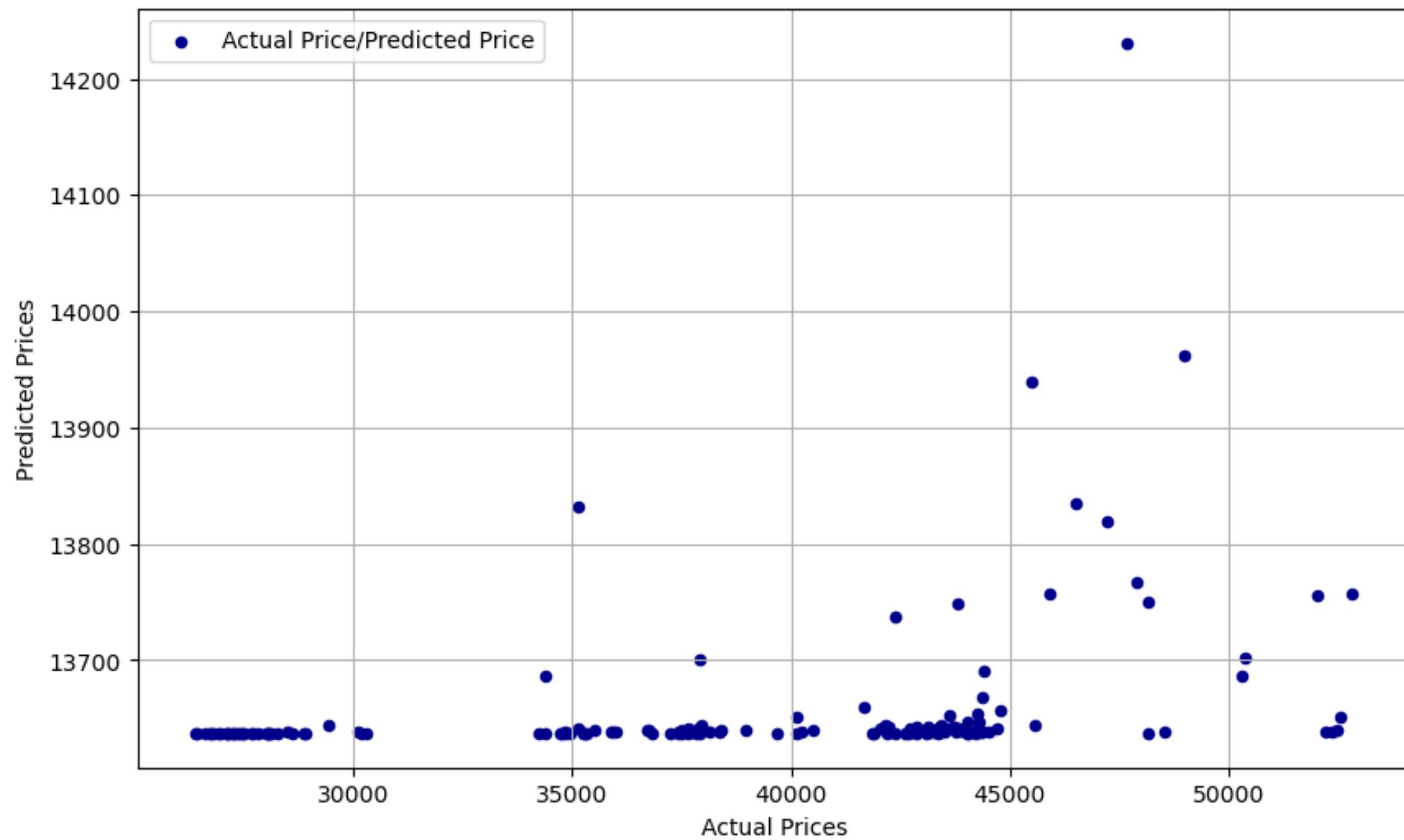
POLYNOMIAL

Polynomial regression is a type of regression analysis in which the relationship between the independent variable x and the dependent variable y is modeled as an n th degree polynomial. Unlike simple linear regression that hypothesizes a direct proportional relationship, polynomial regression can fit curved lines, making it suitable for more complex datasets with turns and bends in the trend.

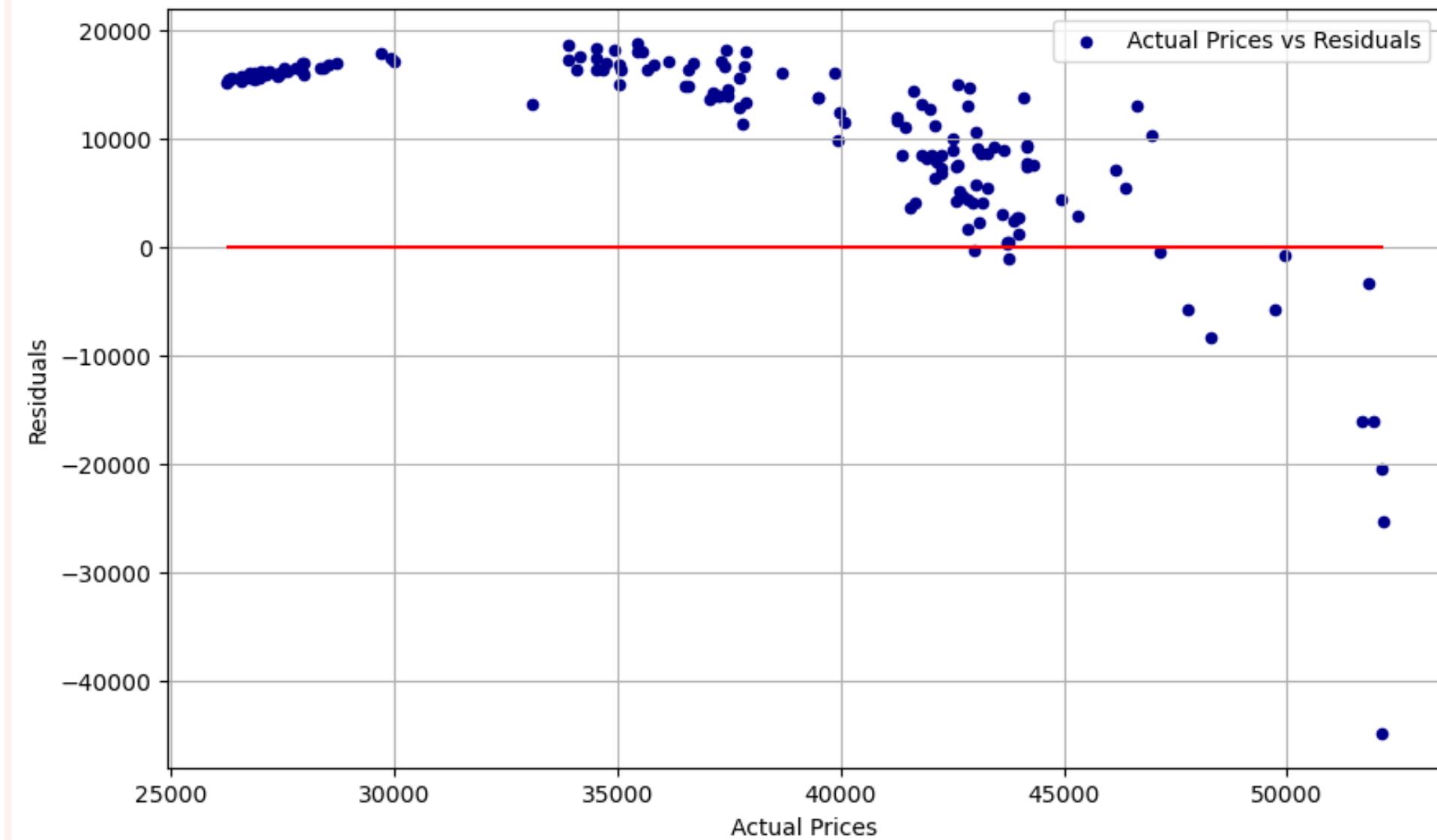
$$y = a_0 + a_1x + a_2x^2 + \dots + a_nx^n$$

POLYNOMIAL

Actual vs Predicted Prices

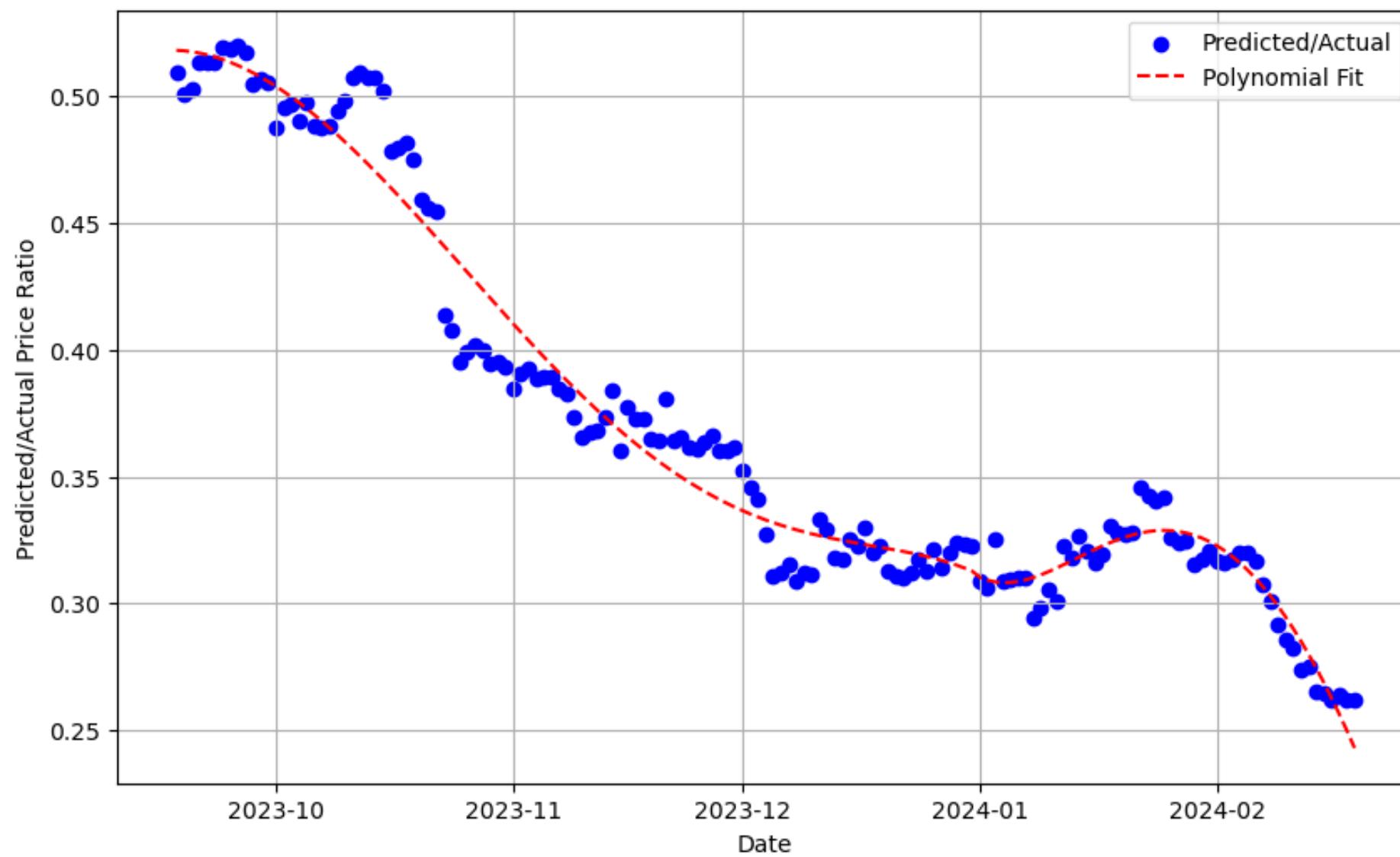


Actual Prices vs Residuals

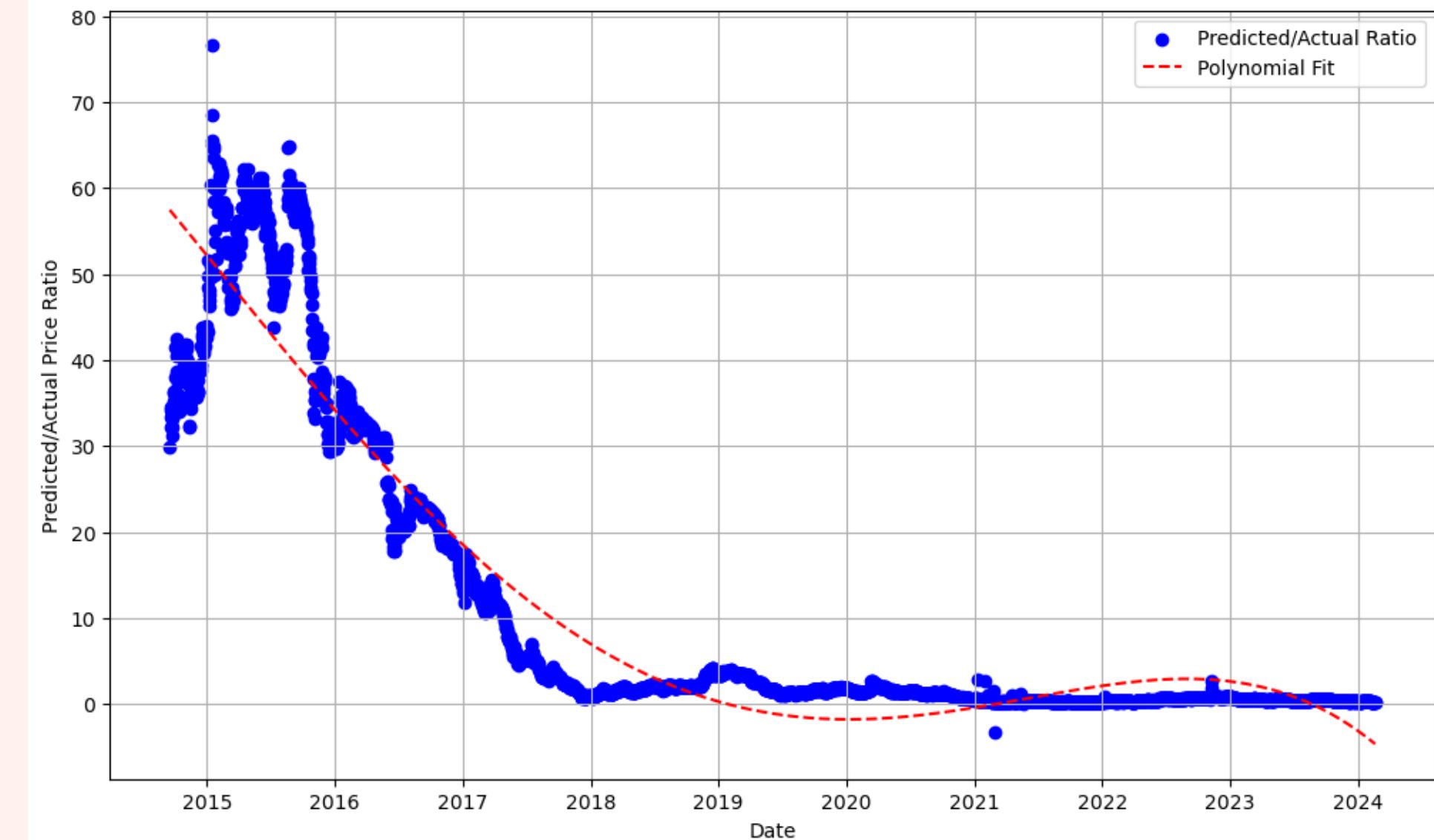


COMPARISON

Ratio of Predicted to Actual Prices For Test Data



Ratio of Predicted to Actual Prices Over Time



PREDICTION

We used the average of each feature data for last 30 days to predict the close price for Bitcoin from 2024-4-20 to 2024-12-31.

Our data looks quite similar because we used the average value of the same features every day. We originally wanted to use data from days 1 to 30 for the first dataset, days 2 to 31 for the second dataset, and so on.

	Date	DayOfYear	Open	High	Low	Volume	Predicted Close
0	2024-04-20	111	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.529854
1	2024-04-21	112	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.528792
2	2024-04-22	113	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.527731
3	2024-04-23	114	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.526670
4	2024-04-24	115	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.525608
5	2024-04-25	116	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.524547
6	2024-04-26	117	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.523486
7	2024-04-27	118	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.522424
8	2024-04-28	119	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.521363
9	2024-04-29	120	44908.715365	45739.747917	44395.058464	2.309919e+10	13640.520302

CONCLUSION

Despite facing **challenges** in predicting future Bitcoin prices, our group successfully utilized linear and polynomial regression to gain valuable insights into the **variability** of Bitcoin prices, understand of the complex dynamics influencing Bitcoin's price movements and identify patterns and trends that contribute to the inherent volatility of Bitcoin prices. Understanding of **cryptocurrency markets**, underscores the importance of **adaptability** and continuous learning in navigating the ever-changing landscape of **digital assets**.

FUTURE WORK

1. Refining the models/ try different models
2. Use features more relevant
3. Evaluate Bitcoin from more aspects, like risk factors...
4. Use dataset for other cryptocurrency to compare
5. Correlation matrix/ heatmap to give more insight

REFERENCE

1. Dataset: <https://finance.yahoo.com/quote/BTC-USD/history/>
2. <https://www.cnbc.com/2018/03/23/college-students-use-financial-aid-money-to-invest-in-bitcoin.html>
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4. <https://www.pwc.com/us/en/tech-effect/emerging-tech/understanding-cryptocurrency-digital-assets.html>
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QNA SESSION

**THANK
YOU**