Bitcoin Data Analysis Report

1. Introduction

Bitcoin, introduced in 2009, is the first decentralized cryptocurrency built on blockchain technology. Its journey has been marked by rapid adoption, market volatility, and global attention as a digital asset. This report delves into Bitcoin's historical data, analysing price trends, trading volumes, and market factors influencing its valuation.

2. Data Overview

This dataset provides historical trading data for select Bitcoin exchanges, spanning from January 2012 to the present, with minute-by-minute updates. It offers a comprehensive view of Bitcoin's performance over the years, including detailed OHLC (Open, High, Low, Close) prices and trading volume in BTC, measured by UTC Day.

Bitcoin, as the first and most prominent cryptocurrency, has experienced significant price volatility and trading activity, making it a focal point for traders, analysts, and enthusiasts. This dataset captures the evolution of Bitcoin's market behaviour, providing valuable insights into its historical trends and trading dynamics.

- **Dataset Size**: 6742281 records

- **Columns**:

  The dataset includes the following key columns:

  o **Timestamp:** The specific date and time of the Bitcoin trading data.
  o **Open:** The opening price of Bitcoin at the given timestamp, measured in USD.
  o **High:** The highest price reached by Bitcoin during the specified time interval, measured in USD.
  o **Low:** The lowest price reached by Bitcoin during the specified time interval, measured in USD.
  o **Close:** The closing price of Bitcoin at the end of the given time interval, measured in USD.
  o **Volume:** The total trading volume of Bitcoin (in BTC) during the specified time interval.

3. Analysis Process
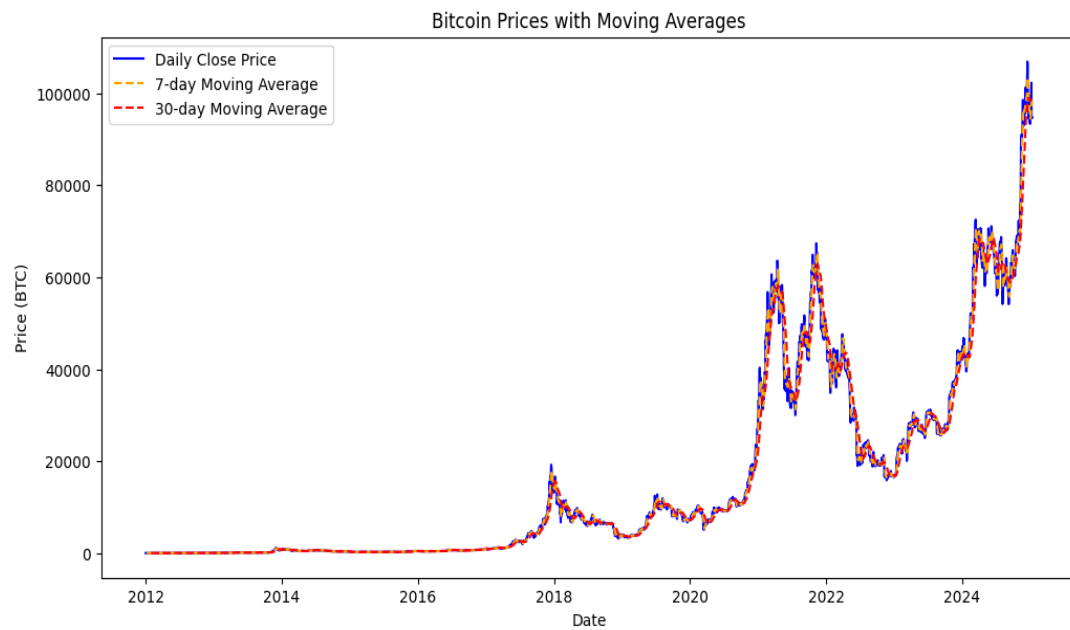
Tools : Python Programming and Power BI

3.1 Data Cleaning

  o Missing Values: Checked for missing data.
  o Duplicate Records: Checked for duplicate rows.
  o Inconsistent Data: Checked for Data types and formatting

3.2 Visualization and Analysis
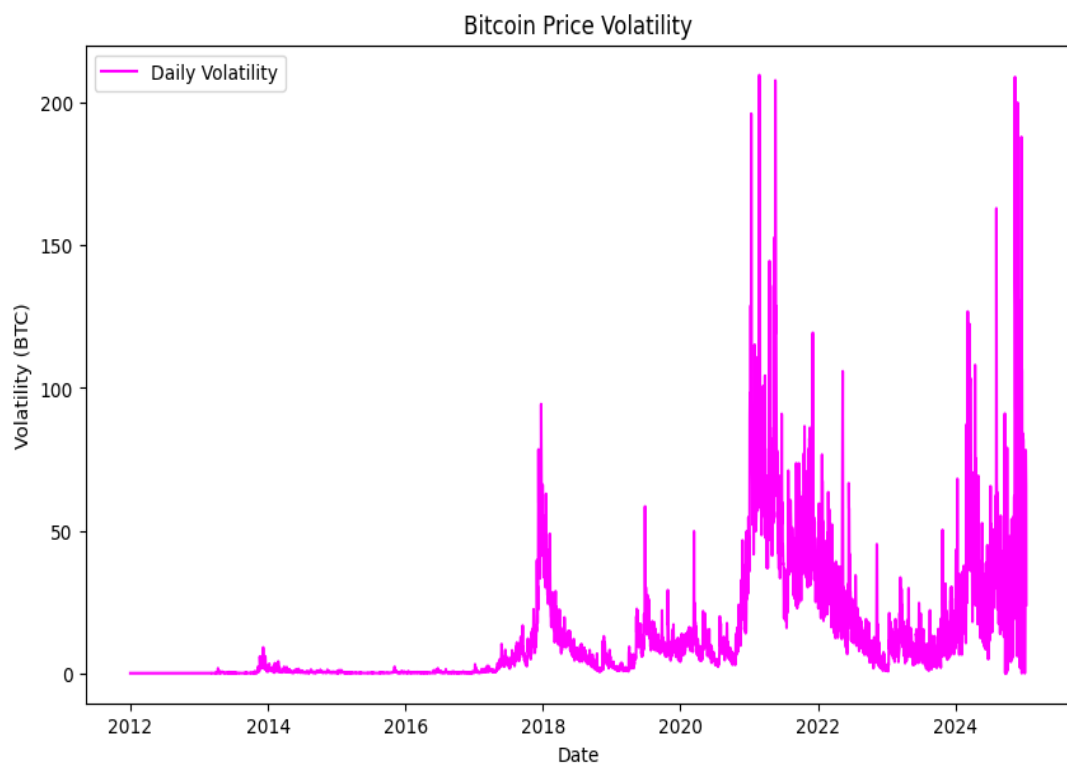
1. Trend Analysis:
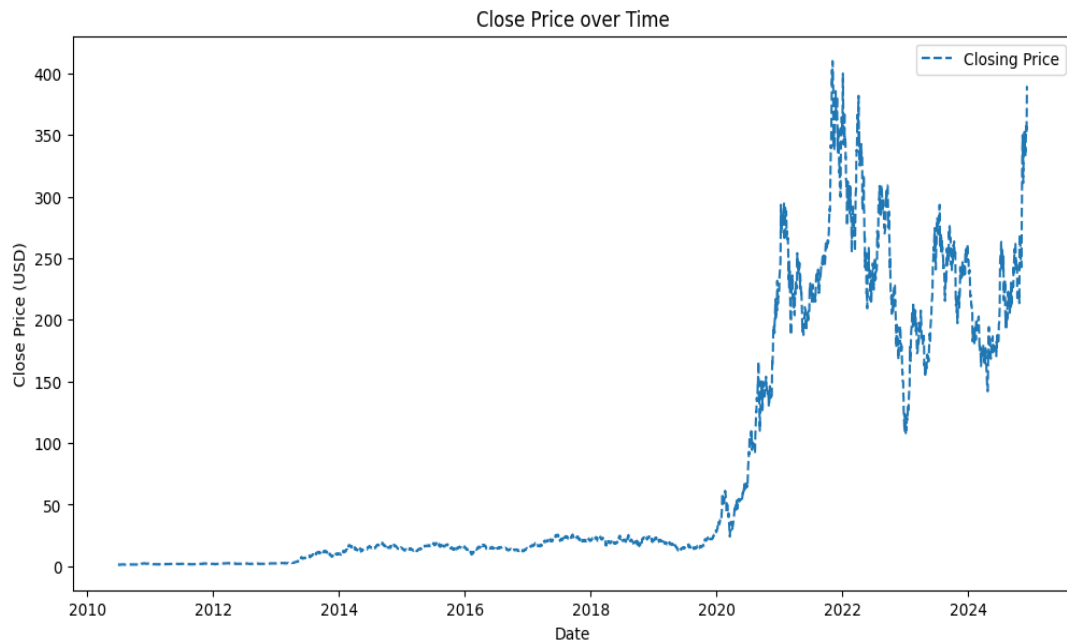   o Calculated rolling averages:

2. Volatility:
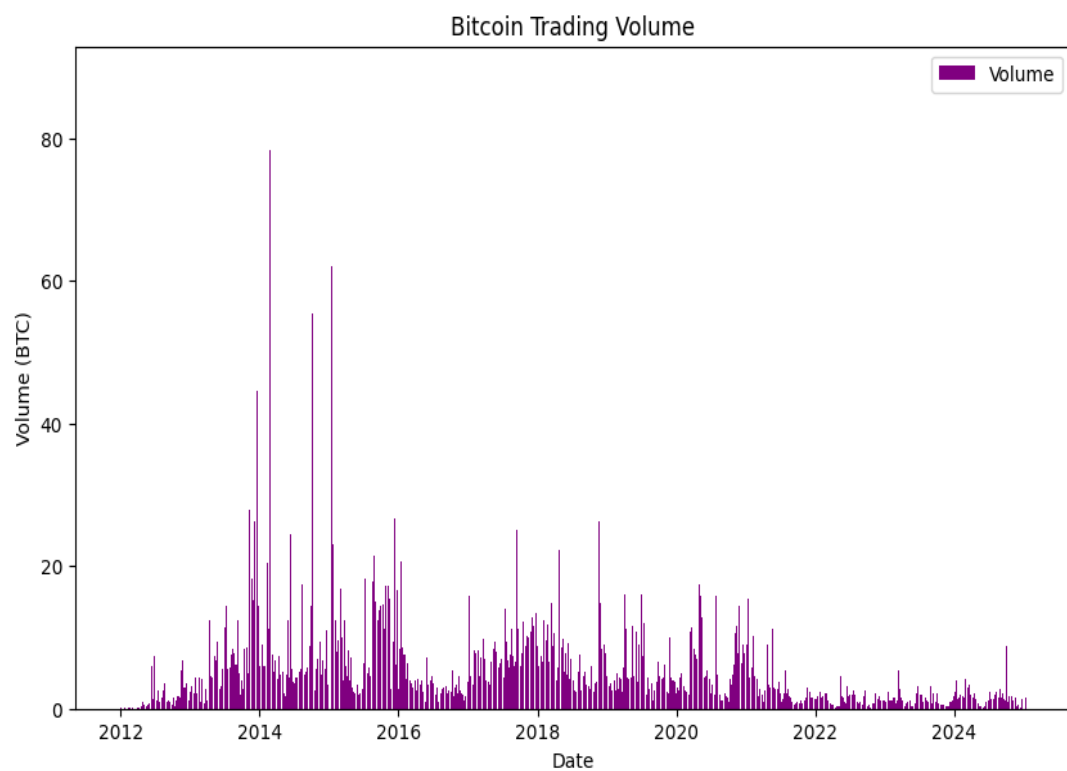   o Computed daily volatility:

3. Visualization Examples:

    o Closing Price Over Time:

    o Trading Volume over Time:

4. **Key Insights**

   1. Historical Price Trends

   - All-Time High Price: $108,364
   - All-Time Low Price: $3.80
   - Average Close Price: $14,620
   - Bitcoin's price has experienced exponential growth since its inception. Notable price surges occurred in 2017 and 2021, coinciding with heightened adoption and speculative trading.

   2. Yearly Price Movements

   - The **average close price** by year shows a consistent upward trajectory.

   - 2017 marked the first significant bull run, with prices reaching new highs as public awareness increased.

   - Post-2020, institutional adoption contributed to price stabilization and further growth.

   3. Trading Volume Analysis

   - **Daily Volume:** The average daily trading volume stood at **5.43 BTC**, indicating robust activity.

   4. Volatility Trends

   - Bitcoin's volatility has been a defining characteristic of its market behavior.

   - Peak volatility years align with significant price movements, particularly in 2017 and 2021.

   - Recent data suggests a decline in volatility, indicating market maturity.

   5. Highs and Lows

   - The gap between average high and low prices has widened over the years, reflecting increased trading activity and speculative behavior.

   6. Market Evolution:

   - Bitcoin has transitioned from an experimental cryptocurrency to a mainstream digital asset.

   - Its increasing average close price underscores its acceptance as a store of value and investment instrument.

5. Recommendations

   o Focus on high-volume months for potential investment opportunities.

   o Monitor trends in percentage changes to identify volatile periods.

   o Include external factors like global market indices or macroeconomic trends to correlate with Bitcoin's performance.

6. Conclusion

Bitcoin's growth has been driven by several factors:

- o **Decentralized innovation and limited supply**, making it a hedge against traditional financial systems.

- o **Institutional adoption**, which has enhanced its credibility and stability.

- o **Macroeconomic trends**, including inflation and currency devaluation, increasing its appeal as an alternative asset.

Despite its volatility, Bitcoin remains the leading cryptocurrency in the digital asset market, with strong growth potential fuelled by technological advancements and increased adoption. This analysis demonstrates Bitcoin's remarkable growth in valuation and market activity, especially post-2020, as it continues to shape the future of the global financial ecosystem.