

Nifty50 Historical Data Analysis using Python

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Introduction

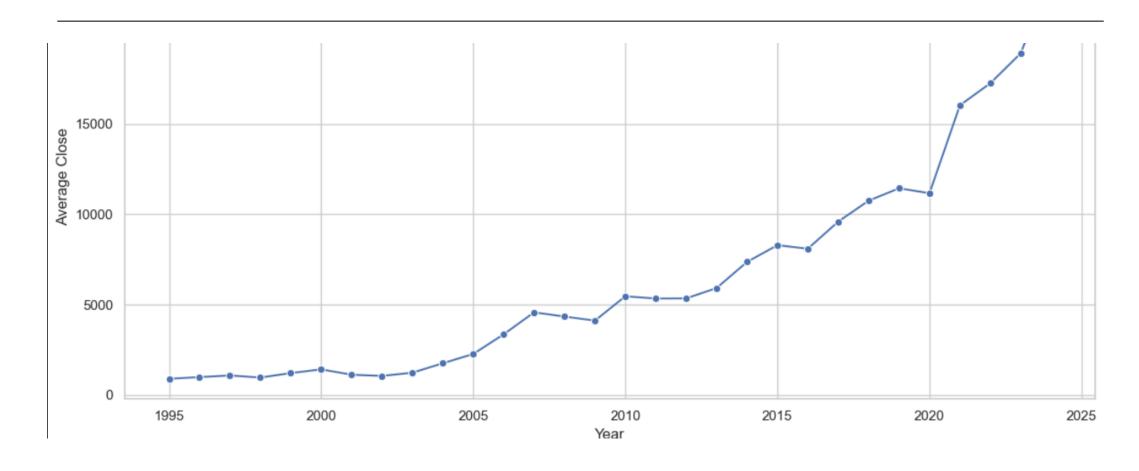
This project analyzes the historical Nifty50 stock index data, focusing on yearly trends, market volatility, and performance insights. The dataset spans from the early 1990s to the 2024, providing a rich ground for financial analysis

Data Cleaning & Preparation

The dataset initially contained rows with missing values in key columns such as Open, High, and Low. These rows were removed to ensure analytical accuracy. The Date column was converted to datetime format, and a new column for 'Year' was extracted for year-wise grouping.



Nifty50 - Yearly Average Close Price



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This line chart illustrates the Yearly Average Close Price of the Nifty50 Index from the year 1994 to 2024. It reveals the long-term growth pattern of the Indian stock market.

Q Key Insights:

From 1994 to 2003, the Nifty50 showed relatively slow and stable growth, staying below 2000 points on average.

A gradual upward trend started around 2004, with notable acceleration around 2007-2008 (just before the global financial crisis).

After a small dip around 2008–2009, the index steadily increased, showing resilience and market recovery.

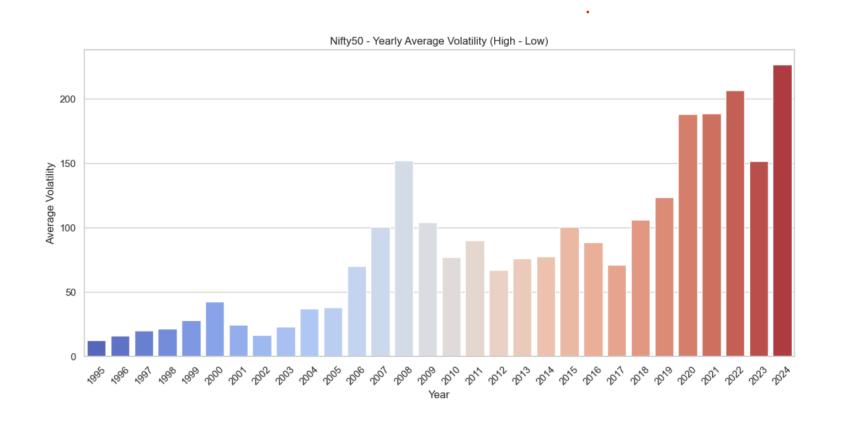
The most **significant jump** occurred post-2020, likely due to economic recovery after the COVID-19 impact.

By 2024, the average close price reached an all-time high of over 22,000, indicating strong investor confidence and a bullish market trend.

***** Conclusion:

The chart clearly indicates that the Nifty50 index has shown **sustainable growth** over the past three decades, with a **sharp rise in recent years**, reflecting the overall **economic development and market performance in India**.

Nifty50 - Yearly Average Volatility (High - Low)'



Nifty50 Yearly Volatility Analysis (1995–2024)

The chart shows the yearly average volatility of the Nifty50 index, calculated as the difference between the yearly high and low values.

From 1995 to early 2000s, volatility remained relatively low and stable, mostly under 50.

A significant spike occurred in 2008, indicating extreme market volatility during the global financial crisis, with the average volatility crossing 150.

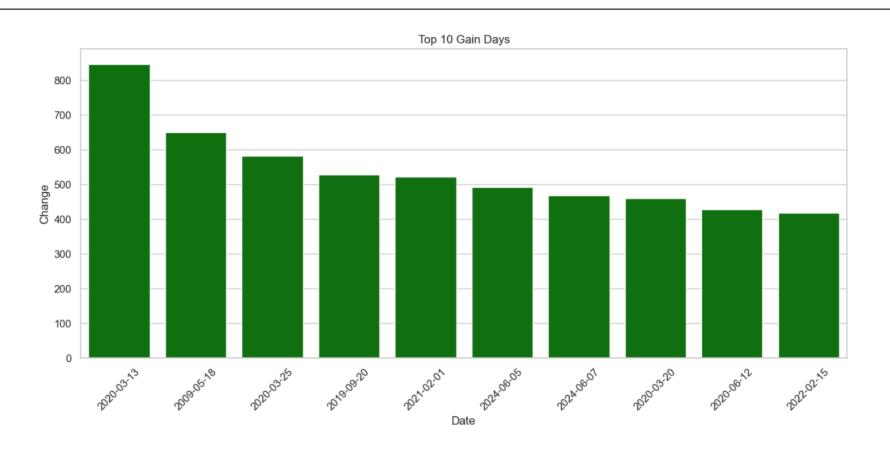
Post-2008, volatility declined but remained moderate, stabilizing between 70–100 for several years.

A new surge began in 2020, likely due to the COVID-19 pandemic and global uncertainty, with volatility reaching above 190.

The highest volatility is seen in 2024, crossing 220, showing increased market fluctuations.

The overall trend indicates a sharp increase in volatility in recent years compared to earlier decades.

Top 10 Gain Days



Top 10 Gain Days

The chart displays the 10 highest gain days (in terms of index change) for the Nifty50.

The Y-axis shows the magnitude of gain (change in points), while the X-axis represents the corresponding dates.

The biggest gain occurred on March 13, 2020, with a gain of over 800 points, likely during the volatile market reactions to early COVID-19 developments.

Other significant gains:

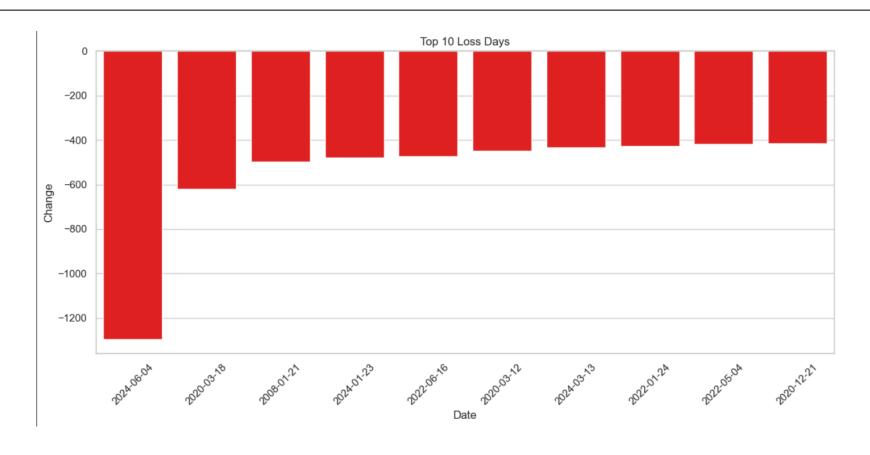
May 18, 2009: Over 650 points – following India's general election results.

March 25, 2020 and February 1, 2021 – both tied to market corrections and Union Budget announcements.

Recent gains in June 2024, showing strong market performance.

Gains ranged from approximately 420 to 850 points, indicating high volatility on those days.

Top 10 Loss Days



Top 10 Loss Days

The largest drop occurred on 2024-06-04, with a loss of more than -1250 points, making it the worst-performing day in this dataset.

The second-largest drop was on 2020-03-18, coinciding with the COVID-19 market crash, showing a loss of around -600 points.

Other significant loss days include:

2008-01-21 and 2020-03-12, likely linked to the 2008 financial crisis and COVID-19 panic selling, respectively.

Multiple 2024 dates, suggesting a volatile market during that year.

Losses range from about -400 to -1300 points, highlighting sharp, short-term market corrections.

Conclusion:

This chart effectively identifies the most volatile and loss-heavy trading days in Nifty50 history, providing insight into periods of economic uncertainty or market panic.

Can We Invest in Nifty50? What Returns Can We Expect in Decades?

Based on the Nifty50 yearly average close price chart, here's a clear and data-backed

Q Observation from Chart (1995–2025):

In 1995, the average close was around 1,000 points.

In 2025, it has risen to nearly 23,000 points.

This means the index grew more than 23 times in 30 years.

NOTICE Investment Perspective:

If someone had invested ₹1,00,000 in Nifty50 in 1995:

In 2025, it could have grown to ₹23,00,000+, assuming no withdrawals and index-based investment (like ETFs or mutual funds tracking Nifty50).

Average Returns:

Using compound annual growth rate (CAGR) formula:

$$ext{CAGR} = \left(rac{23000}{1000}
ight)^{rac{1}{30}} - 1 pprox 11.7\%$$

So, Nifty50 gave an average return of ~11.7% per year over the last 30 years.

✓ Should You Invest in Nifty50?

Yes, because:

Steady Long-Term Growth: Despite short-term crashes (like in 2008, 2020, 2024), the overall trend is strongly upward.

Diversified Exposure: Nifty50 represents India's top 50 companies, reducing individual company risk.

Passive & Easy Investment: Through index funds or ETFs.

Solution Final Thoughts:

Nifty50 is a **good long-term investment** for wealth creation.

Based on history, it can deliver 10–12% annual returns, which doubles your money every 6–7 years.

Discipline + **Patience** = **Strong Returns** in Nifty50.

In the short run, the market is a voting machine, but in the long run, it is a weighing machine.

- BENJAMIN GRAHAM