Week Labeling and Trading Strategies

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Stock Selected: NVIDIA (NVDA)
Time Period: 2020-2024

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1. Assigning True Labels to Weekly Data

To label each week as "Green" or "Red," the following rules were established:

- **Green Label:** Assigned if the weekly return was somewhat positive and the weekly volatility was below 3% roughly (Manually examined)
- **Red Label:** Assigned if the weekly return was negative or the volatility was above 3%.
- **Momentum Consideration:** If the previous two weeks were "Green," and the return was positive, the week was more likely to be "Green." Similarly, consecutive "Red" weeks reinforced the trend.
- **Gap-Down Rule:** If Monday's opening price was more than 2% lower than the previous Friday's close, the week was labeled "Red."

The labeled weekly stock data is attached as **"Labeled Weekly Stock Data.csv."**

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2. Implementing the Buy-and-Hold Strategy

The Buy-and-Hold strategy follows a simple investment approach:

- Invested **$100 at the first trading day of 2020** at the opening price.
- Held the stock for the entire five-year period.
- Sold the stock at the **last trading day of 2024** at the adjusted closing price.

The final portfolio value at the end of 2024 using Buy-and-Hold: **$2303.50**

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3. Implementing the Trading Strategy Based on Labels

A trading strategy was implemented based on the weekly labels, following these rules:

1. **First "Green" week:** Invested $100 and bought shares at the opening price.
2. **If the next week is "Red":** Sold all shares at the closing price and stayed in cash.
3. **If the next week is "Green":** Continued to hold shares if already invested.
4. **If switching from "Red" to "Green":** Bought shares using all available cash.

5. **No short positions were taken, and trading costs were ignored.**

The trading strategy performance is attached as **"Trading Strategy Performance.csv."**

At the end of 2024, the final portfolio value using this strategy was **$12,238.61**

5. Conclusion

- The **trading strategy significantly outperformed** the buy-and-hold approach, leading to a portfolio value of **$12,238.61** compared to **$2,303.50** at the end of 2024.
- **High volatility weeks** had a major impact on price movements. Avoiding investments during highly volatile weeks helped improve returns.
- **Momentum and trend-based rules improved profitability**, as holding through multiple "Green" weeks maximized gains.
- The trading strategy performed **better in volatile years**, whereas buy-and-hold benefited from strong long-term growth but suffered during high-drawdown periods.

This analysis suggests that **an active trading strategy based on systematic rules** can be more profitable than a passive investment approach.

Attachments:

- **Labeled Weekly Stock Data.csv**
- **Trading Strategy Performance.csv**
- **Yearly Strategy Comparison.csv**

End of Report