Total strategy returns : -0.0098 + 0.0097.

= 0.0001

= 0 %

Interpretation:

→ The strategy missed the big day on Day 2 (because it didn't trade on Day 1's NaN.

→ It lost on Day 3 and gained on Day 5.

This is how vectorized backtesting is performed

EVENT-BASED BACKTESTING:

Event based backtesting is a method of evaluating trading strategies by simulating the flow of market events over time, such as price updates, order executions and portfolio changes - one event at a time. Let us understand by the below example.

Example:

Consider the below 10-days closing price data. Perform event based backtesting on the given data.

Day	Price
1	100
2	102
3	101
4	103
5	104
6	106

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Day	Price
7	108
8	107
9	105
10	106

Strategy : Buy Low, Sell High (Threshold-Based)

* Buy if price drops by more than 1% from the previous close.
* Sell the next day (hold for 1 day only).
* Only one open position at a time.
* Use simple returns for clarity.

Example:

Consider the below 8 day closing price data. Perform event based backtesting on the given data.

Day	Price.
1	100
2	99
3	100.5
4	101.5
5	100
6	98
7	98.5
8	99.5

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Step 1: Simulate Day-by-Day Events

We will simulate each day and track:

* Whether a trade is triggered.
* When to enter/exit.
* Cumulative return

Day 2:

Price drop:

$$\frac{99-100}{100} = -1.00\% \Rightarrow \text{Buy signal triggered.}$$

Buy at 99, hold for 1 day.

Day 3:

Sell at 100.5

Return:

$$\frac{100.5-99}{99} = 0.0152 = 1.52\%$$

Add to cumulative return.

Day 4:

Price rose from 100.5 to ~~100~~ 101.5 → No buy

Day 5:

Price Drop:

$$\frac{100-101.5}{101.5} = -1.48\% \rightarrow \text{Buy signal}$$

Buy at 100

Day 6:

Sell at 98

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Return :

$$\frac{98-100}{100} = -2.00\%$$

Add to cumulative return

Day 7 :

Price rose from 98 → 98.5 → no buy

Day 8 :

Price rose from 98.5 → 99.5 → no buy

Summary of Trades :

Trade	Buy Day	Buy Price	Sell Day	Sell Price	Return
1.	Day 2	99	Day 3	100.5	+1.52%
2.	Day 5	100	Day 6	98	-2.00%

~~Final Cumulative Return:~~

* We processed each day one by one (event-based).
* Positions were entered and exited based on event triggers.
* This is more realistic than vectorized logic, especially with rules like "hold 1 day".