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| --- | --- | --- | --- | --- |
| Method | | Bull | Bear | Static |
| Technical indicators | Trend (Method 1) | EMA10 cross above EMA100 | EMA10 cross below EMA100 | Others |
| Trend + Momentum | (Method 2)  Close Price > 100 EMA, RSI > 50 | Close Price < 100 EMA,  RSI < 50 | Others |
| (Method 5)  +DI cross above -DI, Stochastic Oscillator cross above 50 | +DI cross below -DI, Stochastic Oscillator cross below 50 | Others |
| Momentum + Volatility | (Method 3)  BB\_low > Close Price,  RSI < 30 | BB\_high < Close Price,  RSI > 70 | Others |
| (Method 4)  BBp% < 0, RSI < 30 | BBp% > 1, RSI > 70 | Others |
| Naive (Method 6) | | Change in Return > 20% | Change in Return < 20% | Others |
| HMM (Method 7) | | Automatically output three states | | |
| GMM (Method 8) | | Automatically output three states | | |

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| Categories | Independent variables (X) | Dependent variables (Y) |
| Naive | Open, High, Low, Close, Returns | States  (bull, bear, static) |
| Technical | Trend, Momentum, Volatility |
| Macroeconomic | 10 Year-3 Month Treasury Yield Spread, 10-Year Breakeven Inflation Rate |





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| # | Features |
| 1 | Returns |
| 2 | Returns + Open/High/Low/Close(OHLC) |
| 3 | Returns + OHLC +Technical |
| 4 | Returns + OHLC +Technical |
| 5 | Returns + OHLC +Technical + Economic |
| 6 | Returns + OHLC +Technical + Economic |
| 7 | Returns + Economic |
| 8 | Returns +Technical + Economic |

