Technical Indicators and Trading Signals

Your Name

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1 Technical Indicators and Trading Signals

2 Descriptions

10-Day Moving Average (10D MA): A short-term trend indicator showing the average price over 10 days. *Buy* when price is above MA, indicating an uptrend. *Sell* when below, indicating a downtrend.

30-Day Moving Average (30D MA): A medium-term trend indicator showing the average price over 30 days. *Buy* when price is above 3MA, indicating an uptrend. *Sell* when below, indicating a downtrend.

Stochastic Oscillator (%K and %D): Measures momentum by comparing a security's closing price to its price range over a specific period. *Buy* if %K or %D is increasing, indicating upward momentum. *Sell* if decreasing.

Relative Strength Index (RSI): Measures the speed and change of price movements. *Buy* when RSI $\leq$ 30 (oversold). *Sell* when RSI $\geq$ 70 (overbought).

Momentum: Measures the rate of price change. *Buy* if Momentum is positive, indicating continued upward movement. *Sell* if negative.

Moving Average Convergence Divergence (MACD): Indicates changes in momentum by comparing short-term and long-term moving averages. *Buy* if MACD is rising. *Sell* if falling.

Commodity Channel Index (CCI): Measures the deviation of the price from its average. *Buy* when CCI $\leq$ -100 (potential bottom). *Sell* when CCI $\geq$ 100 (potential top).

Indicator	Formula	Trading Signal
10-Day Moving Average (10D MA)	$MA = \frac{\sum_{i=0}^{9} \text{Price}_i}{10}$	$MA_{td} = \begin{cases} 1 & \text{if Price} > M \\ 0 & \text{otherwise} \end{cases}$
30-Day Moving Average (30D MA)	$3MA = \frac{\sum_{i=0}^{29} \text{Price}_i}{30}$	$3MA_{td} = \begin{cases} 1 & \text{if Price} > 3 \\ 0 & \text{otherwise} \end{cases}$
Stochastic Oscillator (%K and %D)	$\%K = \frac{\text{Price} - \text{Lowest Low}_{10}}{\text{Highest High}_{10} - \text{Lowest Low}_{10}} \times 100$ $\%D = \frac{\sum_{i=0}^{2} \%K_i}{3}$	$\%K_{td}$ $\begin{cases} 1 & \text{if } \%K > \%K_{\text{shift}(1)} \\ 0 & \text{otherwise} \end{cases}$ $\%D_{td}$ $\begin{cases} 1 & \text{if } \%D > \%D_{\text{shift}(1)} \\ 0 & \text{otherwise} \end{cases}$
Relative Strength Index (RSI)	$\Delta\text{Price} = \text{Price}_i - \text{Price}_{i-1}$ $\text{Gain} = \frac{\sum_{i=0}^{13} \max(\Delta\text{Price}_i, 0)}{14}$ $\text{Loss} = \frac{\sum_{i=0}^{13} \max(-\Delta\text{Price}_i, 0)}{14}$ $RS = \frac{\text{Gain}}{\text{Loss}}$ $RSI = 100 - \frac{100}{1+RS}$	$RSI_{td} = \begin{cases} -1 & \text{if RSI} \geq 70 \\ 1 & \text{if RSI} \leq 30 \\ 0 & \text{otherwise} \end{cases}$
Momentum	$\text{Momentum} = \text{Price} - \text{Price}_{\text{shift}(10)}$	Momentum_{td} $\begin{cases} 1 & \text{if Momentum} > 1 \\ 0 & \text{otherwise} \end{cases}$
Moving Average Convergence Divergence (MACD)	$EMA_{12} = \text{Price}_{\text{ewm(span=12, adjust=False).mean()}}$ $EMA_{26} = \text{Price}_{\text{ewm(span=26, adjust=False).mean()}}$ $MACD = EMA_{12} - EMA_{26}$ $\text{Signal Line} = MACD_{\text{ewm(span=9, adjust=False).mean()}}$	$MACD_{td}$ $\begin{cases} 1 & \text{if MACD} > MACD_{\text{sh}} \\ 0 & \text{otherwise} \end{cases}$
Commodity Channel Index (CCI)	$TP = \frac{\text{High} + \text{Low} + \text{Price}}{3}$ $SMA_{TP} = \frac{\sum_{i=0}^{19} TP_i}{20}$ $MD = \frac{\sum_{i=0}^{19} |TP_i - SMA_{TP}|}{20}$ $CCI = \frac{TP - SMA_{TP}}{0.015 \times MD}$	$CCI_{td} = \begin{cases} -1 & \text{if CCI} \geq 10 \\ 1 & \text{if CCI} \leq - \\ 0 & \text{otherwise} \end{cases}$

Table 1: Technical Indicators and Their Trading Signals