TRADING BOT — (Candles v1.0.1)

1) Overview

This bot trades multiple Coinbase products using EMA crossovers on fixed-interval candles with optional RSI/MACD "advisor" vetoes. It prefers maker (post-only) orders with per-product offsets, tracks daily buy spend, reconciles fills, and logs KPIs to CSV.

2) Key Features

• Candle-driven EMA strategy with confirmation candles
• Optional RSI/MACD advisor vetoes (one-sided RSI, normalized MACD in bps)
• Maker-prefer pricing with per-product offset basis points
• Daily BUY cap, per-product cooldown, optional hard stop (bps below cost basis)
• Immediate fill processing and periodic reconciliation of recent fills
• Lightweight persistence of state, trades, portfolio, and processed fill IDs
• Clean startup/shutdown, signal handling, and session P&L footer logging

3) File Layout

• main.py — entry point; loads env, wires config, handles signals, opens WS, optional startup reconcile, then runs.
• bot/config.py — BotConfig dataclass for products, candle/EMA/advisors, risk, maker offsets, logging, etc.
• bot/tradebot.py — core engine: Coinbase REST/WS, candle building, indicators, signals, orders, fills, P&L, CSV.
• bot/indicators.py — RSI, EMA, MACD (with signal and histogram).
• bot/strategy.py — advisor settings and veto logic for RSI/MACD.
• bot/orders.py — rounding helpers and maker limit computation.
• bot/constants.py — state directory and filenames.
• bot/persistence.py — JSON load/save, log rotation, spend/cooldown trackers, portfolio store, processed fills.

4) Quick Start

• Python 3.10+ recommended.
• Install dependencies for the Coinbase Advanced Trade SDK and dotenv.
• Create an APIkeys.env (or set ENV_PATH) with:
  COINBASE_API_KEY=...
  COINBASE_API_SECRET=...
  PORTFOLIO_ID=... (optional)
• Run: python main.py

5) Environment / Paths

• ENV_PATH (optional): path to .env with API keys (default: APIkeys.env).
• BOT_STATE_DIR (optional): overrides default ".state" folder under repo.

6) State & Logs (under .state by default)
• daily_spend.json — running per-day BUY totals (last ~14 days).
• last_trades.json — cooldown timestamps per product.
• trade_log.txt — human-readable trade lines and session P&L footer.
• portfolio.json — positions, weighted cost basis, lifetime realized P&L.
• processed_fills.json — de-dup index for fills reconciliation.
• trades.csv — per-fill KPI rows (time, side, size, price, fees, pnl, slippage est., hold time, etc.).

7) Configuration (bot/config.py)
General:
• product_ids — default basket of majors/large caps.
• mode — "ws" (subscribe to exchange candles) or "local" (aggregate from ticker).
• candle_interval — e.g., 5m (maps to seconds internally).
• min_candles / warmup_candles — indicator warm-up.
• confirm_candles — number of consecutive cross confirmations before acting.
• short_ema / long_ema — default 40 / 120 for 5m.
Advisors:
• enable_advisors — turn RSI/MACD vetoes on/off.
• rsi_period — default 14; rsi_buy_max=60 (block BUY if RSI>60); rsi_sell_min=40 (block SELL if RSI<40).
• macd_fast/slow/signal — 12/26/9; normalized hist in bps with thresholds (buy_min=+3, sell_max=−3).
Risk/Execution:
• dry_run — True for paper; False to trade live.
• usd_per_order — default $20.
• daily_spend_cap_usd — default $120; stops further BUYs after cap (SELLs continue).
• per_product_cooldown_s — default 900s.
• hard_stop_bps — optional emergency stop (e.g., 120 = −1.2% vs. cost basis).
Maker/Post-only:
• prefer_maker — post-only BUYs by default; prefer_maker_for_sells can be set separately.
• maker_offset_bps — default global offset if no per-product override.
• maker_offset_bps_per_product — mapping of product→offset bps.
Advanced:
• ema_params_per_product — per-coin overrides for short/long EMA/min candles.
• lookback_hours — for startup reconcile of recent fills.
• ema_deadband_bps — small band to avoid flapping around the cross.
• log_level, portfolio_id.

8) How Signals Work
• On each closed candle, short and long EMAs update.
• A crossover beyond a small deadband yields a provisional direction (+1 BUY, −1 SELL).
• The first detected trend only "primes" (no trade). Thereafter, direction changes must hold for confirm_candles in a row.

• Advisors (if enabled) can veto only when conditions are clearly unfavorable:
 – BUY veto if RSI>rsi_buy_max or MACD_hist<bps threshold.
 – SELL veto if RSI<rsi_sell_min or MACD_hist>bps threshold.
• A per-product cooldown gates repeated trades.
• SELLs are only placed if there is a position. An optional hard_stop can force an immediate market SELL if price falls X bps below cost basis.

9) Order Placement
• Maker-preferred path computes a post-only limit price offset from best bid/ask (fallback to last) and rounds to exchange increments; BUY size comes from usd_per_order/price, SELL size is clamped to held position.
• If maker is disabled for a side, a market order is sent: BUY by quote_size (USD), SELL by base_size up to the held position.

10) Fills, P&L, and CSV
• Immediate post-order fetch attempts to pull fills by order_id; each fill updates positions, cost basis, fees, and lifetime realized P&L.
• A compact fingerprint prevents double-counting; recent fills reconciliation (lookback_hours) backfills anything missed.
• Each fill appends a CSV row, including an estimated slippage vs. intent price and optional hold time when a full round-trip closes the position.
• At shutdown (or when daily BUY cap hit), a session P&L footer is written to the trade log.

11) Dry Run Mode
• No orders are sent; cash P&L is simulated from BUY/SELL notionals; daily spend and cooldown stamps still apply; KPI CSV is still written where possible.

12) Minimal Usage
• Edit bot/config.py to your taste (products, risk, advisors).
• Put keys into APIkeys.env.
• Run: python main.py
• Stop with Ctrl+C. The bot handles SIGINT/SIGTERM and closes cleanly.

13) Notes & Tips
• For 5-minute candles the default 40/120 EMA pair is tuned for smoother signals.
• If you run multiple short sessions per day, enable the startup reconciliation to catch late fills and keep portfolio state consistent.
• The per-product maker offsets can be trimmed/tuned based on observed fill quality.
• Keep an eye on trades.csv for slippage and hold-time diagnostics.

— End —