# **Detailed Design Document for a Minervini-Inspired Stock Buy Signal System (Python Implementation)**

## **I. Executive Summary**

This document outlines the detailed design for a Python-based algorithmic trading system engineered to generate high-conviction "buy stock confirmation signals." The system is built upon the robust principles of Mark Minervini's Specific Entry Point Analysis (SEPA) strategy, a proven methodology for identifying and capitalizing on "superperformance" stocks.

The core of this system involves a multi-stage filtering process that systematically evaluates potential stock candidates. This process begins with an initial technical trend qualification, followed by rigorous fundamental analysis, precise technical pattern recognition for optimal entry, and a comprehensive, integrated risk management framework. The system's primary objective is to translate Minervini's qualitative trading wisdom and observed market behaviors into quantifiable, codeable rules, leveraging Python for efficient data processing, indicator calculation, and signal generation. The design explicitly considers the capabilities of modern programming environments, including potential assistance from tools like Cursor AI for code implementation.

The foundational philosophy underpinning this system is Minervini's "risk-first" approach, which is central to achieving consistent "superperformance." This strategy prioritizes aligning trades with confirmed primary uptrends (specifically, Stage 2 market phases) and identifying companies that demonstrate accelerating earnings and sales growth. Crucially, it emphasizes pinpointing low-risk, high-reward entry points and strictly adhering to predefined risk management protocols to preserve capital. Minervini's own track record, including averaging 220% per year from 1994-2000 for a compounded total return of 33,500%, despite a win rate of approximately 50%, underscores the critical importance of disciplined risk control in achieving exceptional returns.1

## **II. Introduction to the Minervini SEPA Strategy**

The Specific Entry Point Analysis (SEPA) framework is a comprehensive trading strategy that meticulously combines corporate fundamental analysis with the technical behavior of a stock. This methodology is not based on subjective opinions or academic theories but is derived from rigorous historical research and decades of real-world application, focusing on observed market facts.1 The primary aim of SEPA is to identify and pinpoint the exact moment to enter a trade that offers the lowest possible risk and the highest potential for reward, thereby maximizing the likelihood of immediate profitability and rapid price appreciation.1

### **Key Pillars of SEPA:**

1. **Trend:** A cornerstone of SEPA is the absolute requirement that a stock be in a definite price uptrend. This trend must be identifiable early in the superperformance advance to leverage the powerful force of institutional buying..1
2. **Fundamentals:** Superperformance phases are consistently driven by a significant improvement in a company's earnings, revenue, and profit margins. This fundamental strength typically becomes measurable and apparent before the stock enters its most explosive price appreciation phase..1
3. **Catalyst:** Every stock that achieves a substantial gain is propelled by an underlying catalyst. This could manifest as a new, hot-selling product, regulatory approval (e.g., FDA), a newly awarded contract, or even a change in leadership (e.g., a new CEO). The catalyst serves to attract and sustain institutional interest..1
4. **Entry Points:** Superperformance stocks characteristically provide at least one, and often multiple, opportunities to enter a meteoric rise at a low-risk juncture. Precise timing of these entry points is paramount to avoid premature stop-outs or substantial losses..1
5. **Exit Points:** Recognizing that not all trades will result in gains, SEPA mandates the establishment of predefined stop-loss points to protect capital from losing positions. Conversely, identifying the conclusion of a superperformance phase is equally vital to realize and secure profits..1

### **SEPA Ranking Process (Multi-Stage Filtering):**

The system will implement a hierarchical filtering process to systematically narrow down the vast universe of stocks to a manageable list of high-conviction candidates.

1. **Initial Trend Qualification:** Stocks must first satisfy the strict criteria of the "Trend Template" (detailed in Section IV.A). This initial filter is exceptionally rigorous; Minervini notes that approximately 95% of all stocks that meet the Trend Template criteria subsequently fail to pass through the subsequent screens, underscoring its effectiveness in narrowing the field..1
2. **Quantitative Fundamental Screening:** Stocks that pass the initial trend filter are then subjected to a quantitative screen based on their earnings, sales, and margin growth, as well as their relative strength and price volatility..1
3. **Qualitative/Historical Profile Matching:** The remaining, highly filtered stocks are then scrutinized for their alignment with Minervini's "Leadership Profile." This involves comparing their specific fundamental and technical factors to historical models of past superperformers, further refining the candidate list..1
4. **Final Review (Automated & Manual Override):** The significantly narrowed list of candidates undergoes a detailed review. This stage evaluates reported earnings and sales, earnings and sales surprise history, EPS and revenue growth and acceleration, company-issued guidance, analyst estimate revisions, profit margins, industry and market position, potential catalysts, performance relative to their sector, and detailed price and trading volume analysis, along with liquidity risk. For an automated system, this traditionally "manual review" stage will be translated into a composite confidence score or a set of explicit, weighted rules, with provisions for human oversight and override for qualitative factors..1

### **Probability Convergence:**

A key objective of the SEPA method is to identify the precise point where all relevant factors—company fundamentals, stock price action, volume activity, and overall market conditions—converge synergistically. This alignment of supporting probabilities creates a high-conviction trade setup, akin to "four cars arriving at the same time at a four-way intersection," signaling the optimal moment for trade execution..1

### **Superperformance Traits (Initial Universe Filtering):**

Before applying the detailed SEPA filters, the system will apply broad filters to define the initial universe of stocks, focusing on characteristics common to historical superperformers.

* **Youthful:** The system will prioritize stocks that are relatively young in their public trading history. Historically, a superperformance phase often occurs within the first 10 years after a company's Initial Public Offering (IPO), with a preference for companies that have gone public in the preceding 1-2 years. Many such companies operated successfully as private entities for years before their IPO, entering the public market with a proven track record of earnings and growth..1 This initial filter significantly reduces the computational load by focusing the search on the most fertile ground for explosive growth.
* **Size Matters:** The system will primarily target small-cap and mid-cap stocks. These companies typically experience their highest growth phases when they are nimble and can expand rapidly. Compared to large-cap companies, smaller firms, especially those with a relatively small number of shares outstanding (float), require less institutional demand to significantly move their stock price. While large-cap stocks can experience rallies, they rarely achieve the "superperformance" scale of younger, smaller companies..1 Therefore, defining a market capitalization range (e.g., configurable thresholds for small-cap <$2B and mid-cap <$10B) is essential for the initial stock universe. This focus leverages the inherent advantage of individual investors over large institutional funds, which are often constrained by liquidity requirements from taking meaningful positions in smaller companies..1

## **III. System Architecture and Data Requirements**

The algorithmic trading system will be structured into several interconnected modules, each responsible for a specific aspect of the trading process. This modular design facilitates maintainability, scalability, and independent development or enhancement of components.

### **High-Level System Components:**

* **Data Acquisition Module:** Responsible for fetching and ingesting both historical and real-time market data from various financial data providers. This includes price/volume data, fundamental financial statements, analyst estimates, and relevant news feeds.
* **Data Preprocessing Module:** Cleans, validates, and normalizes raw data. It also calculates all derived metrics required for the SEPA strategy, such as various moving averages, growth rates (EPS, revenue, margins), and custom relative strength indicators.
* **Rule Engine (Filtering Module):** Implements the entire set of Minervini's SEPA qualification rules. This module acts as a multi-layered filter, systematically evaluating stocks against technical (Trend Template, pattern recognition) and fundamental criteria.
* **Signal Generation Module:** Identifies precise buy pivot points based on qualified stocks and their constructive price patterns. This module is responsible for issuing actionable buy signals when all conditions for a low-risk, high-reward entry are met.
* **Risk Management Module:** A critical component that enforces all risk control protocols. This includes calculating position sizing based on predefined risk percentages, setting initial stop-loss orders, and dynamically managing trailing stops for profit protection.
* **Monitoring & Alerting Module:** Continuously tracks active positions and monitors for predefined exit conditions (e.g., stop-loss hit, trend reversal, material change in behavior). It triggers alerts for human intervention or automated exit execution.
* **Portfolio Management Module:** Manages the overall portfolio, tracking open positions, calculating real-time profit/loss, and ensuring adherence to portfolio-level risk limits and diversification guidelines.
* **Logging & Reporting Module:** Records all system activities, including data ingestion, rule evaluations, signal generations, trade executions, and performance metrics. This data is crucial for post-trade analysis, backtesting, and system optimization.

### **Required Data Types and Sources:**

To effectively implement the Minervini SEPA strategy, the system requires access to comprehensive and granular financial data:

* **Historical Price & Volume Data:** Daily and weekly Open, High, Low, Close (OHLC) prices, along with corresponding trading volume. This data is foundational for calculating moving averages, identifying trends, and recognizing price patterns.
* **Quarterly Financials:** Detailed quarterly reports including Earnings Per Share (EPS), Revenue, Gross Profit, Operating Income, Net Income, Shares Outstanding, and key Balance Sheet items such as Inventories, Accounts Receivable, Cash, and Debt. This granular data is essential for assessing earnings quality and financial health.
* **Annual Financials:** Annual EPS and Revenue figures are necessary for calculating longer-term growth rates and detecting "breakout years" in fundamental performance.
* **Analyst Estimates:** Consensus EPS and Revenue estimates for current and next fiscal quarters and years, along with historical revision data. These are crucial for identifying earnings surprises and tracking analyst sentiment.
* **Company Guidance:** While often qualitative, forward-looking statements from company management regarding future earnings, sales, and margin expectations are important. This may require parsing news releases and conference call transcripts.
* **Relative Strength (RS) Data:** A reliable Relative Strength ranking against a broad market index (e.g., S&P 500, Nasdaq Composite). Minervini explicitly references "Investor's Business Daily" RS ranking, but a custom-calculated RS metric can also be used..1
* **Market Indices Data:** Historical and real-time data for major market indices (e.g., S&P 500, Nasdaq Composite, Dow Jones Industrial Average) are necessary for overall market trend analysis and identifying market-level turning points.
* **Company Information:** Basic corporate data including Industry Group/Sector classification, Market Capitalization, and IPO date.

### **Data Granularity and Frequency Considerations:**

The strategy demands specific data granularities to capture different market dynamics:

* **Daily Data:** Essential for calculating short-term moving averages (e.g., 50-day SMA), observing detailed price action, identifying volume spikes, pinpointing precise pivot points, and performing intraday volume extrapolation.
* **Weekly Data:** Crucial for calculating longer-term moving averages (e.g., 150-day, 200-day SMAs), confirming broader trend (Stage Analysis), and recognizing larger base pattern formations.
* **Quarterly/Annual Data:** Used for fundamental analysis, including the assessment of earnings, sales, margins, and balance sheet health, typically updated as financial reports are released.
* **Real-time/Intraday Data:** For immediate confirmation of pivot point breakouts and for dynamically extrapolating intraday volume to confirm the strength of a breakout during market hours.

The emphasis in Minervini's methodology on "Trust but Verify" and the principle that "Price Action Trumps Fundamentals" has a profound implication for the system's data processing pipeline and rule execution order. Price action reflects the collective judgment and money flow of institutional investors, which Minervini considers paramount for timing trades.1

This means the system's filtering process is not a simple sequential execution of "fundamental then technical" or vice-versa. Instead, technical data, particularly trend confirmation (via the Trend Template), serves as the *initial and most critical filter*.1 A fundamentally strong stock will be disqualified if it fails to meet the technical trend criteria (e.g., if it is in a Stage 4 downtrend), because poor price action indicates a lack of institutional sponsorship or underlying issues not yet apparent in fundamentals. Conversely, for precise entry, the technical "Pivot Point" is the final trigger, even if fundamental strength has been established earlier. This design prioritizes the

*effect* (observable price and volume behavior) over the *cause* (underlying fundamentals) for optimal timing and capital allocation.

## **IV. Technical Qualification Rules: Trend & Pattern Recognition**

This section details the technical criteria a stock must satisfy to be considered a buy candidate, focusing on trend confirmation and constructive price patterns. These rules are applied after the initial universe filtering (youthful, size matters).

### **A. Stage Analysis & Trend Confirmation (The Trend Template):**

The "Trend Template" is a non-negotiable set of eight criteria that a stock must meet to be considered in a confirmed Stage 2 uptrend. Minervini explicitly states that if *any* of these criteria are not met, the stock is immediately disqualified from further consideration for a buy signal.1 This rigorous initial filter is designed to align the system's purchases with the prevailing primary trend, leveraging institutional buying momentum. The strictness of this template is evident in Minervini's observation that approximately 95% of all stocks that initially qualify under the Trend Template subsequently fail to pass through the deeper fundamental and pattern recognition screens.1 This demonstrates that the Trend Template itself is an exceptionally powerful probabilistic filter, significantly reducing the universe of candidates and focusing the system's resources on only the highest-quality setups.

1. **Current Price vs. 150-day & 200-day Moving Averages:**
   * **Criterion:** The current stock's closing price MUST be above both its 150-day Simple Moving Average (SMA) and its 200-day SMA.
   * **Rationale:** This criterion ensures that the stock is trading above its intermediate and long-term price trends, indicating sustained buying interest and a clear Stage 2 (advancing phase) characteristic.1
2. **150-day MA vs. 200-day MA Relationship:**
   * **Criterion:** The 150-day SMA MUST be positioned above the 200-day SMA.
   * **Rationale:** This bullish alignment confirms that the intermediate-term trend is stronger than the long-term trend, signaling healthy momentum in the uptrend..1
3. **200-day MA Trend Direction and Duration:**
   * **Criterion:** The 200-day SMA line MUST be trending upwards for at least 1 month, with a preference for 4-5 months minimum in most cases.
   * **Rationale:** This confirms a sustained long-term uptrend, indicating that the stock has moved decisively beyond a flat (Stage 1, neglect) or declining (Stage 4, capitulation) phase. A stock in a long-term downtrend is explicitly avoided, regardless of fundamental appeal..1
4. **50-day MA vs. Longer-Term Moving Averages:**
   * **Criterion:** The 50-day SMA MUST be positioned above both the 150-day SMA and the 200-day SMA.
   * **Rationale:** This configuration indicates that the short-term trend is the strongest, a characteristic often associated with accelerating uptrends and robust institutional accumulation..1
5. **Current Price vs. 50-day MA:**
   * **Criterion:** The current stock's closing price MUST be trading above its 50-day SMA.
   * **Rationale:** This confirms immediate bullish price action and ensures the stock is not undergoing a significant short-term pullback that could signal weakening momentum..1
6. **Price Proximity to 52-Week Low (Percentage Threshold):**
   * **Criterion:** The current stock price MUST be at least 30% above its 52-week low. (Many of the best selections will be 100%, 300%, or greater above their 52-week low before they emerge from a solid consolidation period and mount a large scale advance.)
   * **Rationale:** This rule filters out "bottom-fishing" attempts, which Minervini advises against due to the tendency for stocks near their lows to remain in Stage 1 or Stage 4, lacking upside momentum. Superperforming stocks often appear "too high" or "expensive" to amateur investors precisely because they have already demonstrated significant upward momentum..1
7. **Price Proximity to 52-Week High (Percentage Threshold):**
   * **Criterion:** The current stock price MUST be within at least 25% of its 52-week high (the closer to a new high, the better).
   * **Rationale:** This criterion identifies stocks showing strong relative strength and nearing potential breakout points. Stocks at or near 52-week highs have no "overhead supply" (trapped buyers looking to sell at breakeven) to contend with, facilitating further appreciation..1
8. **Relative Strength (RS) Ranking:**
   * **Criterion:** The stock's Relative Strength ranking (e.g., as reported in Investor’s Business Daily, or a custom calculated metric against a broad market index like the S&P 500 or Nasdaq Composite) MUST be no less than 70, and preferably in the 80s or 90s.
   * **Rationale:** This ensures the stock is significantly outperforming the broader market, a hallmark characteristic of market leaders and future superperformers..1

**Table: Minervini Trend Template Rules (Codeable Criteria)**

| Rule # | Description | Minervini's Criterion | Codeable Criteria (Python Logic) |
| --- | --- | --- | --- |
| 1 | Current Price vs. Longer-Term MAs | Current stock price > 150-day SMA & 200-day SMA | price > SMA(price, 150) AND price > SMA(price, 200) |
| 2 | 150-day MA vs. 200-day MA | 150-day SMA > 200-day SMA | SMA(price, 150) > SMA(price, 200) |
| 3 | 200-day MA Trend Direction | 200-day SMA trending up for >= 1 month (pref. 4-5 months) | slope(SMA(price, 200), period=20) > 0 (for 1 month) OR slope(SMA(price, 200), period=100) > 0 (for 5 months) |
| 4 | 50-day MA vs. Longer-Term MAs | 50-day SMA > 150-day SMA & 200-day SMA | SMA(price, 50) > SMA(price, 150) AND SMA(price, 50) > SMA(price, 200) |
| 5 | Current Price vs. 50-day MA | Current stock price > 50-day SMA | price > SMA(price, 50) |
| 6 | Price Proximity to 52-Week Low | Current price >= 30% above 52-week low (pref. 100%+) | (price / min(price, 52\_week\_period)) - 1 >= 0.30 |
| 7 | Price Proximity to 52-Week High | Current price within <= 25% of 52-week high (closer better) | (max(price, 52\_week\_period) - price) / max(price, 52\_week\_period) <= 0.25 |
| 8 | Relative Strength (RS) Ranking | RS ranking >= 70 (pref. 80s or 90s) | RS\_ranking >= 70 |

### **B. Constructive Price Consolidation Patterns (VCP & Variants):**

Once a stock successfully passes the Trend Template, the system then searches for specific chart patterns that signify a period of "rest or digestion" within the established Stage 2 uptrend. These consolidation periods are critical as they indicate that institutional buying is occurring, and the stock is being accumulated by strong hands, thereby preparing for its next upward move.1

**Volatility Contraction Pattern (VCP) Definition and Detection Logic:**

The VCP is a fundamental concept in Minervini's methodology, serving as a universal principle underlying all constructive price bases. It is not merely a visual shape but a quantifiable representation of supply and demand dynamics.1

* **Definition:** A VCP is characterized by a progressive contraction of price volatility from left to right within the base structure. This reduction in price swings is consistently accompanied by a significant contraction in trading volume, particularly in the tighter areas of the base. This pattern culminates in the establishment of a precise entry point, known as the "line of least resistance," where supply is minimal..1
* **Quantifying Contraction Count (e.g., 2T, 3T, 4T):** The system will detect a series of successive contractions (referred to as "Ts" for turns or contractions), typically ranging from 2 to 6. A key characteristic is that each successive contraction's depth (measured as the high-to-low percentage pullback within that swing) should be approximately half (allowing for a reasonable deviation) of the previous pullback. For example, a 25% correction might be followed by a 15% correction, and then an 8% correction..1
* **Volume Contraction during Consolidation:** Volume MUST contract significantly during the tightest portion of the consolidation, particularly on the right side of the base. This often means volume dropping to levels well below its average, with some individual days showing extremely low volume, sometimes near the lowest levels observed since the Stage 2 advance began. This drying up of volume is a critical signal that selling pressure has abated and supply has diminished, indicating the stock is primed for a rapid price increase if demand reappears..1

**Pattern Variants (VCP as the underlying principle):**

While VCP is the core concept, it manifests in various recognizable chart patterns:

* **Cup-with-Handle / Saucer-with-Platform:** This classic pattern features a rounded bottom (the "cup" or "saucer") followed by a smaller, shallower consolidation on the right side (the "handle"). The "handle" portion is where the VCP characteristics (volatility and volume contraction) are most critical and should be strictly observed..1
* **Flat Base:** A relatively tight and narrow sideways price pattern, typically lasting between 4 to 7 weeks. The price correction from high to low within this base should generally not exceed 10-15%. Due to its inherent tightness, a significant VCP may not be as pronounced as in wider patterns..1
* **Double Bottom:** This pattern forms a "W" shape, where the second low is often higher than the first, signaling diminishing selling pressure. The crucial aspect for a valid buy signal is that the right side of the "W" (as the stock approaches the breakout point) must exhibit clear VCP characteristics.
* **High Tight Flag (Power Play):** This is a high-velocity pattern, indicating a dramatic shift in a company's prospects. It requires an explosive initial price thrust, where the stock gains 100% or more in less than eight weeks, typically on huge volume. This thrust is then followed by a tight sideways consolidation, correcting no more than 20-25% (or even less, sometimes as little as 10%) over a period of 3-6 weeks (or even as short as 12 days). The consolidation *must* display VCP characteristics. This is the *only* situation where Minervini suggests entering a trade with a "dearth of fundamentals," as the extreme price action itself is the primary signal that "something major is going on" with the stock..1

**Identification of Shakeouts and Avoidance of Time Compression:**

* **Shakeouts:** The system will detect instances where the stock's price briefly drops below an obvious prior support level (often triggering amateur stop-losses) and then rapidly recovers. Such "shakeouts" are considered constructive as they "weed out weak holders" and strengthen the base, making the subsequent advance more sustainable. Ideally, 1-3 such shakeouts should be observed within the base formation..1
* **Time Compression:** The system must identify and avoid patterns exhibiting hazardous "time compression." This manifests as V-shaped price action or an absence of proper right-side development within the base. A quick up-and-down gyration does not provide sufficient time for weak holders to be eliminated and for supply to be absorbed by stronger hands. A constructive base generally requires a duration ranging from 3 weeks to as long as 65 weeks, with most optimal bases forming between 7 and 25 weeks..1

**Evidence of Demand (Volume Clues):**

Beyond volume contraction within the base, the system will look for explicit signs of institutional demand:

* **Price Spikes:** Significant upward price spikes, particularly occurring off the lows of a correction or on the right side of the base, are strong indicators of institutional buying. These spikes gain greater credence when accompanied by outsized trading volume..1
* **Volume Surges:** The system will look for surges in volume on up days that are several hundred percent (or even up to 1000%) higher than the average daily volume. Crucially, up days and up weeks on increased overall volume should be more frequent and exhibit larger volume than down days and down weeks..1
* **Gaps:** Upward price gaps, especially those occurring on substantial volume, are powerful signals. These typically result from unexpected positive news (e.g., better-than-expected earnings, favorable industry developments, or brokerage house upgrades) that fundamentally shifts perception and generates strong buying demand..1

**Table: Key Technical Pattern Characteristics for Coding**

| Pattern Type | Key Characteristic | Codeable Condition/Metric | Threshold/Range | Volume Behavior |
| --- | --- | --- | --- | --- |
| **VCP (General)** | Volatility Contraction (Ts) | Pullback\_N\_Depth / Pullback\_N-1\_Depth | ~0.5 (e.g., 0.4-0.6) | Volume\_Contracted\_Period / Avg\_Volume < 0.5 (often much lower) |
|  | Price Tightness | Daily\_Range\_Percent | Decreasing from left to right | Volume\_at\_Tightest\_Point < SMA(Volume, 50) |
|  | Base Duration | Weeks\_in\_Base | 3-65 weeks (most 7-25) | N/A |
|  | Correction Depth | Peak\_to\_Trough\_Correction\_Percent | 15-50% (avoid >60%) | N/A |
| **Cup-with-Handle** | Handle Depth | Handle\_Depth\_Percent | < 15% (ideally) | Volume contraction in handle |
|  | Handle Position | Handle\_Low\_Position\_in\_Cup | Upper third of cup | N/A |
| **Flat Base** | Correction Depth | Peak\_to\_Trough\_Correction\_Percent | 10-15% max | Consistent, often below average |
|  | Duration | Weeks\_in\_Base | 4-7 weeks | N/A |
| **High Tight Flag (Power Play)** | Initial Price Thrust | Price\_Gain\_Percent\_Initial\_Thrust | >= 100% | Volume\_Initial\_Thrust is Huge (e.g., 5-10x avg) |
|  | Consolidation Depth | Consolidation\_Depth\_Percent | <= 20-25% | Volume\_Consolidation is Very Low, contracting |
|  | Consolidation Duration | Weeks\_in\_Consolidation | 3-6 weeks (as low as 12 days) | N/A |
| **Shakeout** | Price Undercut | Price\_Low\_Undercut\_Previous\_Low | Yes | Volume\_on\_Undercut is High, followed by quick recovery on volume |
|  | Recovery Speed | Days\_to\_Recover\_Shakeout | Fast (few days) | N/A |
| **Time Compression** | V-Shape Detection | V\_Shape\_Ratio (e.g., Depth / Width) | Avoid sharp V-shapes | N/A |
|  | Right Side Development | Right\_Side\_Duration | Adequate (not too quick) | N/A |
| **Demand Evidence** | Price Spikes | Daily\_Price\_Gain\_Percent | Significant (e.g., >5%) | Daily\_Volume\_Ratio\_to\_Avg > 200% (or much higher) |
|  | Up Gaps | Gap\_Up\_Percent | Significant (e.g., >2%) | Volume\_on\_Gap\_Day is High |

## **V. Fundamental Qualification Rules: Growth & Quality**

This section details the fundamental criteria a stock must satisfy to be considered a buy candidate, focusing on robust growth and high earnings quality.

### **A. Earnings and Sales Strength:**

The system will prioritize companies that demonstrate strong, consistent, and accelerating growth in their core business operations. This growth is the primary driver of superperformance stock prices.1

* **Quarterly EPS Growth (Year-over-Year % and Minimums):**
  + **Criterion:** The system will require a minimum of 20-25% Year-over-Year (YOY) EPS growth in the most recent 1-3 quarters. During bull markets, the preference is for companies delivering 40-100% or even greater YOY EPS growth.
  + **Rationale:** Strong and consistent EPS growth is a powerful magnet for institutional investors, signaling a highly profitable and well-managed business. Companies that report four, five, or six strong quarters in a row provide even greater assurance of being on the right track..1
* **Quarterly Sales Growth (Year-over-Year % and Minimums):**
  + **Criterion:** Quarterly sales growth must exhibit similar strong YOY percentages as EPS. It is not uncommon for new market leaders to show triple-digit sales growth in their most recent quarters.
  + **Rationale:** Ensuring that earnings growth is supported by robust revenue expansion is crucial. This helps to filter out earnings that might be inflated by accounting maneuvers or one-time events, rather than genuine business expansion..1
* **Earnings Acceleration (Sequential Quarter-over-Quarter Improvement):**
  + **Criterion:** The system will detect a pattern where the YOY EPS growth rate is increasing sequentially over several quarters (e.g., a progression from -5% to 10%, then 28%, and finally 56%). Historical analysis shows that over 90% of the biggest stock market winners exhibit some form of earnings acceleration before or during their major price moves..1
  + **Logic:** To smooth out quarterly noise and identify underlying trends, the system can calculate a 2-quarter rolling average of EPS and Sales growth. This provides a clearer picture of the improving trend..1
* **Annual EPS Growth and "Breakout Year" Detection:**
  + **Criterion:** The system will assess strong annual EPS growth. For instance, Apollo Group averaged almost 40% annual EPS growth during its superperformance phase. The system will also identify if current annual earnings are breaking out above a multi-year trend (e.g., surpassing the high set in the previous 2-4 years or more).
  + **Rationale:** A sustained annual growth rate and a "breakout year" signal a significant positive shift in the company's long-term profitability trajectory..1
* **Earnings and Sales Surprise Detection (Percentage Beat Thresholds):**
  + **Criterion:** The system will focus on companies that beat consensus earnings estimates by a *meaningful margin*, not just by a penny or two.
  + **Rationale:** Significant earnings surprises (where reported earnings are meaningfully better than expected) are powerful catalysts that trigger institutional buying and prompt analysts to revise their earnings estimates upward. This phenomenon, often referred to as the "cockroach effect," suggests that one positive surprise often portends more good quarters ahead..1
* **Analyst Estimate Revisions (Upward Revisions, Percentage Thresholds):**
  + **Criterion:** The system will prioritize stocks for which current fiscal year or next fiscal year earnings estimates are trending higher from 30 days prior, preferably by 5% or more.
  + **Rationale:** Upward revisions by analysts indicate improving sentiment and future prospects for the company, further attracting institutional interest. Conversely, large downward revisions are a significant red flag..1

The consistent emphasis on *acceleration*—in EPS, sales, and sequential quarter-over-quarter improvement—is a key differentiator in Minervini's strategy compared to merely looking for high growth. This indicates that the *rate of change of growth* is often more critical than the absolute growth number alone. This dynamic suggests that the system needs to calculate not just Year-over-Year growth percentages, but also the sequential change in these growth rates. This focus on accelerating momentum in the business operations makes a company significantly more attractive to institutional investors who actively seek companies with rapidly improving prospects, thereby fueling P/E expansion and rapid stock price appreciation.

**Table: Fundamental Screening Criteria (Codeable Rules)**

| Fundamental Metric | Type | Calculation Method | Minimum Threshold | Preferred Threshold | Lookback Period |
| --- | --- | --- | --- | --- | --- |
| Quarterly EPS Growth | Profitability | (Current\_Q\_EPS / Prior\_Year\_Q\_EPS) - 1 | 0.20 (20%) | 0.40 (40%) to 1.00 (100%+) | Most recent 1-3 quarters |
| Quarterly Sales Growth | Revenue | (Current\_Q\_Sales / Prior\_Year\_Q\_Sales) - 1 | 0.20 (20%) | 0.40 (40%) to 1.00 (100%+) | Most recent 1-3 quarters |
| EPS Acceleration | Momentum | (Current\_Q\_Growth - Prior\_Q\_Growth) > 0 | Consistent increase | Strong sequential increase | Past 3-4 quarters |
| Sales Acceleration | Momentum | (Current\_Q\_Growth - Prior\_Q\_Growth) > 0 | Consistent increase | Strong sequential increase | Past 3-4 quarters |
| Annual EPS Growth | Profitability | (Current\_Y\_EPS / Prior\_Y\_EPS) - 1 | 0.20 (20%) | 0.35 (35%) to 0.40 (40%+) | Past 1-2 years |
| Earnings Surprise | Profitability | (Reported\_EPS - Consensus\_EPS) / Consensus\_EPS | Meaningful positive % | Significant positive % | Most recent quarter |
| Analyst Estimate Revisions | Sentiment | (Current\_Estimate\_FY - Prior\_Estimate\_FY) / Prior\_Estimate\_FY | 0.05 (5%) | Higher is better | Last 30 days |
| Annual EPS Breakout | Profitability | Current\_Y\_EPS > Max\_EPS\_in\_Lookback\_Period | Yes | Yes | Past 2-4 years |

### **B. Earnings Quality and Financial Health:**

Beyond raw numerical growth, the system must assess the *quality* and sustainability of a company's earnings. This involves scrutinizing financial statements for underlying health and avoiding companies whose reported performance may be misleading or unsustainable.1

* **Exclusion of Non-operating/Non-recurring Income:**
  + **Criterion:** The system will isolate and evaluate earnings derived solely from a company's core operations. It will exclude any one-time gains (e.g., from the sale of non-strategic assets) or extraordinary events that could artificially inflate reported EPS.
  + **Rationale:** This ensures that the profitability is sustainable and reflects the true health of the ongoing business, rather than temporary or non-repeatable factors..1
* **Analysis of Margin Expansion (Gross and Net Profit Margins):**
  + **Criterion:** The system will look for consistent improvement in both operating margins and net profit margins.
  + **Rationale:** Expanding margins indicate a company's ability to increase its pricing power, improve operational productivity, or effectively cut expenses. Increasing margins directly translate to more profits generated from each dollar of sales. The system will compare a company's net margin to its industry average to gauge its competitive advantage and quality of management..1
* **Inventory Analysis (Growth vs. Sales, Finished Goods vs. Raw Materials):**
  + **Criterion:** The system will monitor inventory levels from quarterly (10-Q) and annual (10-K) SEC filings. A significant red flag is raised if total inventories, and particularly finished goods, are growing *much faster* than sales (e.g., at a rate of 2x or more) without a clear, justifiable explanation (e.g., stocking new stores).
  + **Rationale:** An unexplained inventory buildup often indicates weakening sales, a misjudgment by management of future demand, or product piling up. If these goods are highly depreciable (e.g., electronics), this scenario is even more detrimental, potentially leading to markdowns, write-offs, and future earnings hits..1
* **Receivables Analysis (Growth vs. Sales):**
  + **Criterion:** The system will flag situations where accounts receivables (money owed to the company for sales already made) are increasing at a significantly greater rate than sales.
  + **Rationale:** This suggests the company is having trouble collecting payments from its customers. If both receivables and inventories are rising disproportionately to sales, it constitutes a "double whammy," indicating severe underlying business problems..1
* **Code 33: Simultaneous Acceleration of EPS, Sales, and Margins:**
  + **Criterion:** The system will identify companies that demonstrate three consecutive quarters of acceleration in EPS, sales, *and* profit margins.
  + **Rationale:** This "Code 33" situation is considered a "potent recipe" for explosive stock price appreciation. It signifies that the company is "hitting on all cylinders" – growing its top line, improving efficiency, and expanding its bottom line simultaneously, creating a powerful synergy for superperformance..1

The detailed checks on earnings quality, including the exclusion of non-recurring income, scrutiny of inventory and receivables imbalances, and analysis of margin trends, highlight the necessity for granular financial statement parsing rather than relying solely on summary metrics. This approach moves beyond simple data points to an interpretive analysis of the company's true financial health. An automated system must be capable of accessing and parsing raw financial statements (e.g., from SEC filings via EDGAR) to identify and exclude non-operating income, analyze the composition of inventory (finished goods vs. raw materials), and compare the growth rates of sales, inventory, and receivables. This capability allows the system to detect subtle red flags that might not be immediately apparent in aggregated financial data, filtering out companies whose reported growth is unsustainable or deceptive.

### **C. Catalysts and Industry Group Analysis:**

The system will integrate an understanding of company categories and the role of catalysts and industry trends in driving superperformance.

* **Categorization of Stocks:** The system will classify stocks into distinct categories to apply appropriate analytical lenses and expectations:
  + **Market Leaders:** These are the primary focus. They exhibit the fastest EPS growth, are gaining market share, and possess a scalable business model..1
  + **Top Competitors:** Companies ranked 2nd or 3rd within leading industries. They can also demonstrate strong growth and significant price advances, sometimes even taking market share from the leader..1
  + **Turnaround Situations:** Companies recovering from periods of difficulty. They are characterized by very strong recent earnings (e.g., 100%+ growth in the last 1-2 quarters) stemming from easy comparisons, coupled with recovering profit margins..1
  + **Institutional Favorites:** Mature companies with generally slow growth (low-to-mid teens). While often considered "quality," they are typically avoided for superperformance due to limited rapid price appreciation potential..1
  + **Cyclical Stocks:** Companies sensitive to economic cycles or commodity prices. They exhibit an inverse P/E cycle and require a specialized timing approach, generally not a primary focus for consistent superperformance unless specific cyclical conditions are met..1
  + **Past Leaders/Laggards:** Former market leaders that have peaked or stocks that consistently underperform their industry group. These are generally avoided as buy candidates..1
* **Focus on Leading Industry Groups and IPO Primary Bases:**
  + **Leading Industry Groups:** The system will identify industry groups that are leading new bull markets. Historically, 3 to 10 industry groups often turn up and sprint ahead before broader market indices. The system's portfolio should ideally consist of the best companies within the top 4-5 leading sectors..1
  + **Bottom-Up Approach:** Rather than a top-down approach (sector first), the system will primarily identify leading stocks first (especially those appearing on the 52-week new high list) which then lead to the identification of leading industry groups..1
  + **New Innovations/Catalysts:** The system will be alert for companies operating in new industries, possessing unique market niches, proprietary technology, or benefiting from significant positive sector changes (e.g., deregulation, major new product launches, or critical FDA approvals). These catalysts are frequently the genesis of explosive growth..1
  + **Primary Base:** For youthful companies (IPOs), the system will specifically look for the "primary base." This is defined as the first buyable consolidation pattern after a company goes public. This base typically forms after an initial rally and subsequent profit-taking, requiring a minimum of 3-5 weeks duration and a correction of no more than 25-35% (though longer bases up to a year with up to 50% correction can still be valid). The primary base represents a prime opportunity for entrepreneurial companies..1

The emphasis on "catalysts" and the qualitative nature of some of these drivers (e.g., "new CEO," "cult status") presents a challenge for full automation. While some catalysts (like earnings surprises or FDA approvals) are quantifiable, others are derived from unstructured data like news and market sentiment. To address this, the system will incorporate a mechanism to integrate external, unstructured data. This could involve Natural Language Processing (NLP) to analyze financial news headlines and articles for keywords related to catalysts, assigning a sentiment score. Alternatively, or in conjunction, a human-in-the-loop component could be designed to manually flag stocks identified by human analysts as having strong, qualitative catalysts. Importantly, Minervini notes that for a "Power Play" setup, the extreme price action itself can serve as a proxy for an unidentified catalyst, allowing the system to proceed even if the explicit underlying reason is not yet known.1

## **VI. Signal Generation Logic: Precise Entry Points**

This section details the precise conditions under which a buy signal is generated, focusing on the identification and confirmation of optimal entry points.

### **A. Pivot Point Definition:**

The pivot point represents the culmination of a stock's consolidation (base pattern) and signifies the precise moment for its next advance. It is considered the "call to action" price level and the "optimal buy point".1

* **Identification Logic:** The pivot point is typically identified as the high of the tightest contraction (the rightmost portion of the base) within a Volatility Contraction Pattern (VCP). In the context of a cup-with-handle pattern, it corresponds to the high of the "handle." For a flat base, the pivot point is simply the highest price within the consolidation range..1
* **Volume Confirmation at Breakout:** The breakout above the pivot point MUST be accompanied by significantly expanding volume. During the final contraction leading up to the pivot, volume should typically contract to levels well below average, with some days exhibiting "extremely low" volume, sometimes appearing as a mere trickle near the lowest levels observed in the entire base structure..1 A strong breakout volume, often 200-400% or more of the stock's average daily volume, serves as critical confirmation of genuine institutional buying and the exhaustion of available supply..1

### **B. Entry Triggers:**

* **Price Action above Defined Pivot Point:** A buy signal is generated when the stock's price trades above the calculated pivot point. The system should aim to place an order (e.g., a limit order or a market order, depending on liquidity and spread) slightly above the pivot point. The objective is to buy "as close to the pivot point as possible without chasing the stock up more than a few percentage points" to optimize the risk-reward ratio..1
* **Intraday Volume Extrapolation for Real-time Confirmation:** For real-time confirmation on the potential breakout day, the system will extrapolate intraday volume to estimate the likely end-of-day volume. For example, if a stock's volume after two hours of trading is already 50% of its usual daily average, it can be reasonably projected to reach 300-400% or more of its average by the end of the day, confirming strong demand..1

The emphasis on real-time volume extrapolation and buying "as close to the pivot point as possible" indicates a critical requirement for low-latency data and execution capabilities. Optimal entry involves minimizing slippage and maximizing the potential for immediate profit. Relying solely on end-of-day data for buy signals risks missing a significant portion of the initial breakout move or obtaining a less favorable fill price. Therefore, the signal generation module must be integrated with a real-time data feed and capable of monitoring price and volume continuously during market hours.

### **C. Post-Entry Price Action Monitoring:**

After a position is entered, the system will continuously monitor the stock's subsequent price and volume behavior to validate the trade and manage the position dynamically.

* **"Tennis Ball" vs. "Egg" Action (Resilience and Quick Recovery):**
  + **Criterion:** Healthy stocks, described as "tennis balls," will exhibit brief pullbacks following a breakout. These pullbacks should be quickly met with support, propelling the stock back to new highs within a few days or one to two weeks. Volume should contract during these pullbacks and subsequently expand as the stock resumes its rally. Stocks that fail to bounce back quickly are considered "eggs" and are undesirable..1
  + **Logic:** The system will monitor the depth and duration of pullbacks post-breakout. A pullback that is too deep or prolonged, or one that occurs on high volume, will be flagged as a warning sign.
* **Handling Squats and Reversal Recoveries:**
  + **Squat:** This occurs when a stock breaks out from a pivot point but then falls back into its range and closes off the day's high.
  + **Reversal Recovery:** If a "squat" occurs, the system should not immediately exit. Instead, it will wait for at least one to two days (and potentially up to ten days or longer in some cases) to observe if the stock can stage a "reversal recovery." If the price holds above its 20-day moving average and volume subsides, it suggests the setup may still be valid, indicating a temporary shakeout rather than a failed breakout..1
* **Detecting Failed Breakouts and Early Day Reversals:**
  + **Failed Breakout:** A breakout is considered to have failed if the stock's price does not hold its 20-day moving average or if the price pattern becomes "wider" (characterized by wild, erratic swings up and down)..1
  + **Early Day Reversal:** This occurs when a stock moves up significantly in the morning following a breakout but then reverses and drops back down towards the breakout point before noon or 1:00 p.m. The system should typically allow the stock until the end of the trading day to recover, unless the reversal is so severe that it immediately triggers the protective stop-loss..1

The post-entry monitoring rules emphasize that the initial buy signal is not a "fire and forget" event. The system requires continuous validation of the trade based on subsequent price action. This continuous monitoring acts as an early warning system for potential trade failure. These behaviors are often the first indications of whether the underlying institutional buying pressure is sustained or if weak hands are still present in the stock. Ignoring these subtle cues can lead to larger losses if the initial breakout ultimately fails. Therefore, the system's active trade management module must incorporate state machines that transition based on these post-entry conditions, allowing for dynamic adjustments to the position or early exits.

## **VII. Risk Management and Exit Strategy**

Risk management is unequivocally the most critical building block for achieving consistent success in the stock market.1 The system's design prioritizes capital preservation above all else, acknowledging that even expert traders are not always correct in their predictions.

### **A. Initial Stop-Loss Placement:**

* **Absolute Maximum Loss Percentage:**
  + **Criterion:** Before initiating any trade, the system MUST establish an absolute maximum loss threshold of no more than 10% from the entry price. This is a non-negotiable "line in the sand."
  + **Rationale:** This strict rule is fundamental to preventing small, manageable losses from snowballing into large, potentially unrecoverable ones. For instance, a 50% decline in a stock's price necessitates a 100% gain just to return to the breakeven point. By contrast, a 10% loss requires only an 11% gain to recover..1
* **Average Loss Target:**
  + **Criterion:** The system's design aims for an average loss per trade that is significantly lower than the maximum, ideally in the range of 6-7%.
  + **Rationale:** Minervini's "Loss Adjustment Exercise," where he hypothetically capped all his past losses at 10%, demonstrated a dramatic improvement in overall portfolio performance. This empirical evidence underscores that disciplined loss cutting is the single most impactful factor for long-term profitability..1
* **Placement Logic relative to Technical Support:**
  + **Criterion:** The initial stop-loss order should be strategically placed at a logical level below a significant technical support point (e.g., just below the pivot point, below the low of the consolidation pattern, or below a key short-term moving average like the 20-day SMA).
  + **Rationale:** If the stock's price falls below this predefined technical level, it invalidates the initial bullish setup and signals that the trade's premise was incorrect, necessitating an immediate exit.

### **B. Trailing Stops and Profit Protection:**

* **Dynamic Adjustment Mechanisms for Trailing Stops:**
  + **Criterion:** Once a stock moves into a reasonable profit from the purchase price, the system MUST transition into a profit-protection mode.
  + **Logic:** This involves implementing dynamic trailing stops that automatically adjust upwards as the stock's price rises. These can be set as a fixed percentage below the highest price achieved, a percentage below a key short-term moving average (e.g., the 10-day SMA), or a fixed dollar amount.
  + **Rationale:** Minervini emphasizes that "yesterday's profit is part of today's principal." The objective is to secure accumulated gains and prevent a profitable trade from reverting into a loss..1
* **Logic for Protecting Breakeven Point:**
  + **Criterion:** As soon as a trade achieves a predefined initial profit (e.g., 2-3% gain), the system should move the stop-loss order to at least the breakeven point (entry price plus commissions and fees).
  + **Rationale:** This ensures that even if the stock subsequently reverses its direction, the trade will result in no loss of capital, thereby preserving funds for future opportunities.

### **C. Exit Signals (When to Sell):**

The system must incorporate clear and decisive rules for exiting positions, covering both loss-cutting and profit-taking scenarios.

* **Material Change in Price Behavior (Large Price Breaks on Volume):**
  + **Criterion:** A primary sell signal is generated if a stock experiences its largest daily and/or weekly price decline since the beginning of its Stage 2 advance, particularly if this occurs on overwhelming trading volume.
  + **Rationale:** This behavior strongly indicates significant institutional distribution, even if recent earnings reports or company news appear positive. In such cases, price action is considered paramount and overrides fundamental news, as the market's collective judgment is often discounting future problems..1
* **Transition to Stage 3 (Topping) or Stage 4 (Declining):**
  + **Criterion:** The system will continuously monitor for characteristics indicative of a transition to Stage 3 (topping phase) or Stage 4 (declining phase). Stage 3 signs include increased volatility, wider price swings, the 200-day SMA flattening or rolling over, and the price undercutting the 200-day SMA. Stage 4 is characterized by the price consistently trading below a declining 200-day SMA, forming lower lows and lower highs, and exhibiting volume spikes on down days.
  + **Rationale:** These transitions signal the end of the accumulation phase and the beginning of distribution or capitulation, indicating that the favorable trend has ended. Minervini explicitly states that buying a stock in Stage 4 must be avoided..1
* **Earnings Deceleration and Negative Surprises:**
  + **Criterion:** A significant slowing of the EPS growth rate (e.g., Dell's EPS growth declining from 80% to 28%) or a negative earnings surprise (missing consensus estimates, issuing downside guidance) will trigger an exit evaluation.
  + **Rationale:** These fundamental shifts often precede or confirm a price decline, as institutional investors adjust their valuations based on deteriorating growth prospects..1
* **Excessive P/E Expansion as a Warning:**
  + **Criterion:** If a stock's Price/Earnings (P/E) ratio has expanded by 100-200% (i.e., doubled or tripled) from its initial base breakout, it serves as a warning that the stock may be in the later stages of its price appreciation.
  + **Rationale:** This indicates that much of the company's positive future has already been discounted into the stock price, and the stock is becoming "too widely recognized" and potentially overvalued..1
* **Identification of "Broken Leaders":**
  + **Criterion:** The system will avoid holding or buying former high-fliers that have topped and subsequently broken down significantly (e.g., 70% or more off their peak).
  + **Rationale:** These stocks typically face substantial "overhead supply" from trapped buyers and rarely recover to their former glory quickly. Attempting to "bottom fish" in such scenarios is a common trap for amateur investors..1

### **D. Position Sizing:**

* **Risk-Based Position Sizing Methodology:**
  + **Criterion:** The system MUST calculate the position size for each trade based on a fixed percentage of the total trading capital risked per trade, rather than a fixed dollar amount or a fixed number of shares.
  + **Logic:** For example, if the maximum risk per trade is set at 2% of total capital, and the initial stop-loss for a specific stock is 7% below its entry price, the position size (in dollars) would be calculated as: (0.02 \* Total\_Capital) / 0.07. This ensures that if the stop-loss is hit, the actual capital loss does not exceed the predefined risk percentage.
  + **Rationale:** This methodology is absolutely crucial for avoiding "risk of ruin" and ensures that even a string of consecutive small losses does not severely deplete the trading capital. It is the only aspect of trading that an investor can truly control..1 This adherence to a fixed percentage risk per trade, coupled with hard stop-losses, is not merely a best practice but a foundational element for long-term survival and compounding of capital. It allows the system to remain in the market with sufficient buying power even after experiencing inevitable drawdowns.

## **VIII. Conclusions and Recommendations**

The detailed design outlined in this document provides a robust framework for developing a Python-based algorithmic trading system rooted in Mark Minervini's SEPA methodology. The strategy's emphasis on quantifiable rules, meticulous data analysis, and stringent risk management offers a high-conviction approach to identifying superperformance stocks.

**Key Conclusions:**

* **Systematic Filtering:** The multi-stage filtering process, starting with the strict Trend Template and progressing through detailed fundamental and pattern recognition, systematically narrows the investment universe to high-probability candidates. This structured approach, which filters out approximately 95% of initial Trend Template qualifiers, is critical for focusing resources on quality setups.
* **Techno-Fundamentalist Synergy:** The design effectively integrates technical and fundamental analysis, recognizing that while strong fundamentals drive long-term value, precise technical action (price and volume) provides the critical timing for low-risk entries and early warning signs for exits. The principle that price action can override fundamental news for timing is a core strength.
* **Risk Management as Foundation:** Risk management is not an auxiliary component but the bedrock of the entire system. The explicit rules for initial stop-loss (max 10%, average 6-7%), dynamic trailing stops, and risk-based position sizing (1.5-2% capital risked per trade) are paramount for capital preservation and long-term compounding, even with a 50% win rate.
* **Adaptability to Market Cycles:** The system's focus on Stage 2 trends and its ability to identify emerging leaders during market bottoms allows for adaptability across bull market phases. Its exit rules, triggered by material changes in price behavior and fundamental deceleration, are designed to protect capital during market tops and bear phases.

**Recommendations for Implementation:**

1. **High-Quality Data Infrastructure:** Invest in reliable, low-latency data feeds for both historical (daily, weekly) and real-time (intraday) price/volume data. Access to granular quarterly and annual financial statements (e.g., SEC filings) is crucial for thorough earnings quality analysis.
2. **Modular Development:** Develop each component (Data Acquisition, Preprocessing, Rule Engine, Signal Generation, Risk Management, Monitoring, Portfolio Management, Logging) as independent, testable modules in Python. This will facilitate parallel development, easier debugging, and future enhancements.
3. **Robust Backtesting Framework:** Implement a comprehensive backtesting framework to rigorously test all rules and parameters across various market cycles. This should include walk-forward optimization and Monte Carlo simulations to assess robustness and potential drawdowns.
4. **Human-in-the-Loop for Qualitative Factors:** While the system automates quantitative aspects, consider a human-in-the-loop for qualitative factors like assessing "catalysts" (beyond what NLP can infer) or interpreting nuanced "company guidance." This could involve a dashboard for human review of high-scoring candidates before final signal confirmation.
5. **Continuous Monitoring and Iteration:** The market is dynamic. Post-deployment, continuous monitoring of the system's performance, analysis of failed trades, and iterative refinement of rules and parameters will be essential to maintain effectiveness. This includes regularly reviewing the efficacy of technical pattern recognition and fundamental thresholds against evolving market behavior.

#### Works cited

1. Trade like a stock market wizard.pdf