**Progress Report**

**- Increment 1 -**

**Group #16**

1. **Team Members**

**Darya Pylypenko dp24s lldaryall**

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1. **Project Title and Description**

***Title****:* Market Signal & Research Platform (MSRP)

The Market Signal & Research Platform (MSRP) is a full-stack financial analytics web application designed to help users analyze stock market data and evaluate trading strategies. The system allows users to retrieve historical stock data, compute technical indicators such as Simple Moving Average (SMA) and Relative Strength Index (RSI), and run long-only backtests on rule-based strategies. The platform emphasizes clean architecture, reproducibility, and stable data ingestion to ensure reliable analytical results.

1. **Accomplishments and overall project status during this increment**

During Increment 1, we focused on establishing a strong backend foundation and implementing the core analytical functionality of the platform.

* Backend architecture implemented using FastAPI
* User authentication system with JWT-based login and password hashing
* SQLite database integration for persistence
* Stock data ingestion pipeline using a stable historical data source
* Implementation of technical indicators (Simple Moving Average and Relative Strength Index)
* Development of a rule-based long-only backtesting engine
* Performance metrics computation including total return, maximum drawdown, and win rate
* Service-layer architecture separating API routes, schemas, and business logic
* Functional backtesting API endpoint that returns structured results
* GitHub repository structured with clear issues and organized commits
* Project documentation updated to reflect architecture and usage

At the end of Increment 1, MSRP successfully supports authenticated users running indicator calculations and strategy backtest through stable API endpoints. The core computational engine is functional and reproducible. This aligns with our initial proposal to deliver a working backend analytics system in the first increment.

1. **Challenges, changes in the plan and scope of the project and things that went wrong during this increment**

One of the primary challenges was maintaining architectural discipline while developing multiple system components simultaneously. Ensuring proper separation of concerns between routes, schemas, services, and database logic required careful design decisions early in the process.

Another challenge involved data ingestion reliability. Some financial APIs can be unstable or subject to rate limits. To mitigate this risk, we selected a stable historical data source to ensure reproducibility and minimize external dependency fragility.

Validating the backtesting logic also required careful testing to ensure performance metrics were computed accurately and edge cases were handled properly (e.g., no trades executed, empty signals, insufficient data periods).

**CHANGES IN PLAN:**

We intentionally reduced scope by deferring frontend development to Increment 2. This allowed us to focus exclusively on building a stable, product-style backend foundation.

We also pivoted away from simulating an order book and displaying account-level PnL in this increment. After evaluating the complexity and time constraints, we determined that those features would significantly increase implementation overhead without improving the core analytical engine.

Instead, we chose to broaden our backend exposure by working directly with financial APIs rather than relying on static CSV data. This decision strengthened the realism and robustness of the system while reinforcing API integration skills.

**ISSUES:**

During early development, we experienced environment inconsistencies between team members’ local setups. These were resolved by standardizing dependency management and improving setup documentation.

We also encountered minor authentication token handling issues, which were corrected by refining token validation logic and ensuring consistent request formatting.

1. **Team Member Contribution for this increment**

*Please list each individual member and their contributions to* ***each of the deliverables in this increment*** *(be as detailed as possible). In other words, describe the contribution of each team member to:*

* 1. *the* ***progress report****, including the sections they wrote or contributed to*
  2. *the* ***requirements and design document****, including the sections they wrote or contributed to*
  3. *the* ***implementation and testing document****, including the sections they wrote or contributed to*
  4. *the* ***source code*** *(be detailed about* ***which*** *parts of the system each team member contributed to and* ***how****)*
  5. *the* ***video or presentation***

**Narandan**

a. 2, 3, 4, 5, 7, 8

b. 5, 7

d. Since the backend had to be created first, mostly all of the code was implemented by me. We chose this approach to minimize the possibility of compilation issues and ambiguity concerning naming conventions and the tech stack. This approach ensures a strict contract and will make our infrastructure easy to build upon as we implement our UI and ML features.

e. video – Also mainly me because I own the backend which was our only goal for Increment 1.

Katya – completed the IT document and parts 1, 2, 3, and 6 of the RD documents. As well as specifying future plans for the next increment.

Darya

a. 1

d. Contributed to the backend by closing several issues listed below.

* [**Add Bollinger Bands indicator**](https://github.com/Narandan/msrp-platform/issues/26)
* [**Add EMA (Exponential Moving Average) indicator**](https://github.com/Narandan/msrp-platform/issues/27)
* [**Add Sharpe ratio to backtest metrics**](https://github.com/Narandan/msrp-platform/issues/28)

Logan

b. 4

1. **Plans for the next increment**

*If this report if for the first or second increment, describe what are you planning to achieve in the next increment.*

For the next increment, the team plans to expand the system beyond its current foundational backend capabilities and move toward a more complete and user-interactive trading research platform. Specifically, we intend to enhance the backtesting engine by supporting more flexible, parameterized strategies and incorporating additional performance and risk metrics like Sharpe ratio and maximum drawdown. We also plan to improve the realism of simulations by introducing transaction cost modeling and better capital tracking. In addition, we aim to begin frontend development by implementing a basic React-based interface that connects to the existing FastAPI backend and visualizes backtest results through charts and dashboards. Finally, we will strengthen our testing strategy with more structured unit and integration tests and refine our documentation, including updated diagrams and detailed use case descriptions, to ensure alignment between requirements and implementation.

1. **Stakeholder Communication**

**Subject: MSRP Development Update – Core Backend Completed**

Dear Stakeholders,

We are pleased to provide an update on the Market Signal & Research Platform (MSRP).

During this development phase, we successfully completed the foundational backend infrastructure of the system. Users can now securely authenticate, retrieve historical market data, compute technical indicators such as moving averages and RSI, and execute rule-based backtests to evaluate trading strategies. The platform also calculates key performance metrics including total return and drawdown.

Our primary focus during this phase was architectural stability and reproducibility. By implementing a modular service-layer design and using reliable historical data sources, we ensured that analytical results are consistent and scalable. This positions the platform well for future expansion.

We did encounter minor integration and configuration challenges during development, which were resolved through improved documentation and environment standardization. These adjustments have strengthened the reliability of the system moving forward.

In the next phase, we will expand the platform’s capabilities to include watchlist management, enhanced search functionality, and a user-facing interface to improve accessibility and user experience.

We appreciate your continued support and look forward to sharing further progress soon.

Best regards,  
The MSRP Team

1. **Link to video**

*https://youtu.be/9vk3u2TFzxQ*