Real-Time Stock Data Streaming Application

Project Overview

A sophisticated Python-based real-time stock data streaming application that captures live market data using WebSocket technology.

Author : Shriniwas Kulkarni

- **PCCOE 2026 BTech CSE(AIML)**
- **Email:** kshriniwas180205@gmail.com
- **Phone:** +91 [8999883480]
- **GitHub:** github.com/Shriniwas18K

Technical Architecture

- **Language**: Python 3.8+
- **Data Source**: Finnhub.io WebSocket API
- **Data Storage**: CSV

Key Features

- Real-time stock data streaming
- Multi-threaded message processing
- Robust error handling
- Continuous data logging
- Scalable design

Prerequisites

- Python 3.8+
- Finnhub.io API Key
- Required Python Packages:
  - `websocket-client`
  - `json`

    - `threading`
    - `logging`

Installation

Backend Setup

1. Clone the repository
2. Install dependencies:

   ```
   pip install websocket-client
   ```

3. Set up Finnhub API Key:
    - Create a `.env` file
    - Add: `API_KEY=your_finnhub_api_key`

Configuration

- Modify `tickers` list in `task1.py` to track desired stocks
- Adjust `OUTPUT_PATH` for CSV file location

Running the Application

1. Backend:

   ```
   python task1.py
   ```

Project Structure

- `task1.py` : WebSocket data streaming script
- `op1.csv` : Output data file
- `websocket_data.log` : Application log file
- React component for data visualization

Advanced Concepts Demonstrated

- WebSocket communication
- Concurrent processing

- Error handling
- Logging
- Data persistence
- Reactive programming

Potential Enhancements

- Add more sophisticated error recovery
- Implement real-time dashboard
- Support dynamic ticker management

Security Considerations

- Use environment variables for API keys
- Implement proper error logging
- Secure file handling

Troubleshooting

- Ensure stable internet connection
- Check API key validity
- Verify Python and dependency versions

Contributing

1. Fork the repository
2. Create your feature branch
3. Commit your changes
4. Push to the branch
5. Create a Pull Request

Acknowledgments

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