Cargill Voyage Assistant: Documentation

Team: Sirius **Version:** 1.0 **Date:** January 31, 2026

1. Team Members & Responsibilities

Member	Role	Responsibilities
Dewa	**Team Leader**	Project coordination, strategic direction, final review
Matthew	Data Analyst	Data validation, scenario analysis, model testing
Steven	Software Engineer	Chatbot development, optimization model, AI integration
Chelsea	Business Analyst	Commercial insights, market analysis, presentation
Cindy	Financial Analyst	Cost calculations, profit analysis, report writing

2. File Structure

```
siriustools/
├── chatbot/                  # Main Streamlit application
│   ├── app.py                # Core chatbot UI and logic
│   ├── ai_assistant.py       # Featherless.ai API integration
│   └── guardrails.py         # Security and content filters
│
├── data/raw/                 # All raw data files
│   ├── cargoes.json          # Cargo information
│   ├── vessels.json          # Vessel specifications
│   ├── Port Distances.csv    # Port-to-port distances
│   ├── ffa_rates.json        # Forward Freight Agreement rates
│   └── bunker_prices.json    # Bunker fuel prices
│
├── src/                      # Core optimization modules
│   ├── data_loader.py        # Data loading and cleaning
│   ├── lp_optimizer.py       # OR-Tools linear programming model
│   ├── optimization.py       # Voyage calculation logic
│   └── freight_calculator.py # TCE and profit calculations
│
├── notebooks/                # Jupyter notebooks
│   └── Sirius_Tools_Datathon_Submission.ipynb
│
├── requirements.txt          # Python dependencies
├── README.md                 # Project overview
└── documentation.md          # This file
```

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3. How to Reproduce Results

Prerequisites

- **Python 3.9 or higher** (3.10+ recommended)
- **pip** (Python package manager)
- **Git** (for cloning the repository)

For Windows Users

Step 1: Clone the Repository

Open **Command Prompt** or **PowerShell** and run:

```
git clone https://github.com/ImNuza/siriustools.git
cd siriustools
```

Step 2: Create Virtual Environment (Recommended)

```
python -m venv venv
venv\Scripts\activate
```

Step 3: Install Dependencies

```
pip install -r requirements.txt
```

Step 4: Run the Chatbot

```
streamlit run chatbot/app.py
```

The application will open automatically at `http://localhost:8501`.

For macOS/Linux Users

Step 1: Clone the Repository

Open **Terminal** and run:

```
git clone https://github.com/ImNuza/siriustools.git
cd siriustools
```

Step 2: Create Virtual Environment (Recommended)

```
python3 -m venv venv
source venv/bin/activate
```

Step 3: Install Dependencies

```
pip3 install -r requirements.txt
```

Step 4: Run the Chatbot

```
streamlit run chatbot/app.py
```

The application will open automatically at `http://localhost:8501`.

Running the Jupyter Notebook

To run the Jupyter notebook for detailed analysis:

Windows:

```
jupyter notebook notebooks/Sirius_Tools_Datathon_Submission.ipynb
```

macOS/Linux:

```
jupyter notebook notebooks/Sirius_Tools_Datathon_Submission.ipynb
```

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4. Using the Chatbot

1. **Apply Scenario:** Click the “Apply Scenario” button in the sidebar to run the initial optimization.

2. **Ask Questions:** Use the chat input to ask questions such as:
    - “Show recommendations”
    - “Compare fleet options”
    - “What if bunker prices increase 10%?”
    - “Show TCE heatmap”
    - “What are the thresholds?”
3. **Enable AI Mode (Optional):** Toggle “Enable AI-Enhanced Mode” in the sidebar to get natural language summaries powered by Qwen-72B.
4. **Adjust Scenarios:** Use the sidebar sliders to adjust:
    - Bunker price changes (-20% to +30%)
    - Additional port delay days (0 to 14 days)

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5. Key Assumptions

Parameter	Value	Source
VLSFO Price	$490/MT	Singapore benchmark (Feb 2026)
MGO Price	$649/MT	Singapore benchmark (Feb 2026)
Loading Time	2 days	Industry standard
Discharge Time	2 days	Industry standard
Weather Margin	5%	Conservative estimate
Commission Rate	3%	Standard industry rate
Eco Speed	12 knots laden, 13 knots ballast	Vessel specifications

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6. Troubleshooting

Issue	Solution
`ModuleNotFoundError`	Run `pip install -r requirements.txt` again
Port 8501 in use	Run `streamlit run chatbot/app.py --server.port 8502`
Streamlit not found	Ensure virtual environment is activated
Data not loading	Check that `data/raw/` folder contains all JSON/CSV files

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7. Contact

For questions or issues, contact Team Sirius via the datathon communication channels.