

# Demo Documentation

## Fashion Retail Assistant

This document demonstrates the Fashion Retail Assistant in action across three query types: **SQL analytics**, **RAG product knowledge**, and **hybrid** (SQL + RAG combined). Each example shows the agent's reasoning process: tool selection, refinement, and final synthesis.

**How to run:** uv run src/gui.py

## Example 1: SQL Analytics — Store Performance Analysis

**Query:** "Which of our stores performed the best in 2024?"

**Depth:** 3 (Deep)

**Tools used:** query\_sql (x2)

### Agent Reasoning Process

The agent's plan-execute-reflect loop is visible in the TUI:

**Iteration 1 → Initial query:** The agent generates a SQL query joining transactions and stores tables, grouping by store with revenue, units, and invoice counts. The reflect node identifies that the query did not explicitly filter by year 2024, even though all data in the database is from 2024, the agent adds the date filter for correctness.

The screenshot shows a terminal window titled "Windows PowerShell" with the command "uv run src/gui.py" running. The interface is titled "Fashion Retail Assistant". It displays a session log with the following entries:

- Session:** 2026-02-22 19:35
- You:** Which of our stores performed the best in 2024?
- Tool Step 1: query\_sql**

```
{  
  "sql": "SELECT s.store_name, s.city, s.country, SUM(t.line_total) AS total_revenue, SUM(t.quantity) AS total_units,  
  COUNT(DISTINCT t.invoice_id) AS total_invoices FROM transactions t JOIN stores s ON t.store_id = s.store_id WHERE  
  t.transaction_type = 'Sale' GROUP BY s.store_id ORDER BY total_revenue DESC LIMIT 10"  
}
```
- Plan:** Iteration 1
- Reflect:** Needs more data.  
The collected data provides revenue figures for stores, which is relevant to the question. However, the data does not explicitly confirm that the "total\_revenue" figures are specifically for the year 2024. To accurately answer "Which of our stores performed the best in 2024?", it's crucial to verify or retrieve data explicitly filtered for that year.
- Tool Step 2: query\_sql**

```
{  
  "sql": "SELECT s.store_name, s.city, s.country, SUM(t.line_total) AS total_revenue, SUM(t.quantity) AS total_units,  
  COUNT(DISTINCT t.invoice_id) AS total_invoices FROM transactions t JOIN stores s ON t.store_id = s.store_id WHERE  
  t.transaction_type = 'Sale' AND SUBSTR(t.date, 1, 4) = '2024' GROUP BY s.store_id ORDER BY total_revenue DESC LIMIT  
  10"  
}
```
- Plan:** Iteration 2
- Reflect:** [empty]
- Text:** Ask a question and press Enter

**Iteration 2 → Refined query:** The agent re-executes the query with `SUBSTR(t.date, 1, 4) = '2024'` added to the WHERE clause. The reflect node is now satisfied that the data is explicitly scoped to 2024.

**Synthesized Answer:** The agent returns a formatted table of the top 10 stores ranked by total revenue, with columns for store name, city, country, revenue, units sold, and total invoices. Key insights:

- **China Dominance** → All top 5 stores are in China, led by Store Beijing with 1.59M in revenue
- **US Performance** → Store New York ranks 6th with 214K revenue, significantly lower than even the 5th Chinese store
- **Units vs Revenue** → US stores show higher unit counts but lower revenue, indicating a different pricing/product mix compared to China

The screenshot shows a terminal window titled "Windows PowerShell" with the command `uv run src/gui.py` running. The application title is "Fashion Retail Assistant". A green bar labeled "Reflect" contains the message "Reflect: Satisfied". Below it, a pink bar labeled "Assistant" contains the text "Here are our top-performing stores in 2024, based on total revenue:". A table follows, listing 10 stores with columns: Store Name, City, Country, Total Revenue, Total Units Sold, and Total Invoices. The table data is as follows:

Store Name	City	Country	Total Revenue	Total Units Sold	Total Invoices
Store Beijing	Beijing	China	1586376.70	4362	3905
Store Shanghai	Shanghai	China	1511421.26	4140	3731
Store Guangzhou	Guangzhou	China	1457481.00	3940	3566
Store Shenzhen	Shenzhen	China	1278621.14	3501	3153
Store Chongqing	Chongqing	China	901037.33	2449	2208
Store New York	New York	United States	214131.95	4490	4005
Store Los Angeles	Los Angeles	United States	206586.69	4433	4013
Store Houston	Houston	United States	167947.24	3486	3120
Store Berlin	Berlin	Germany	145383.24	3414	3071
Store Chicago	Chicago	United States	139742.78	2961	2632

**Key Insights:**

- **China Dominance:** All five of the top-performing stores are located in China, with "Store Beijing" leading significantly with over 1.58 million in revenue. This highlights China as our strongest market by a large margin.
- **US Performance:** The top-performing store outside of China is "Store New York" in the United States, generating 214,131.95 in revenue. However, its revenue is substantially lower than even the fifth-ranked Chinese store ("Store Chongqing").
- **Units vs. Revenue:** While Chinese stores lead in revenue, stores in the United States (e.g., New York, Los Angeles) show high unit sales and invoice counts, suggesting potentially lower average transaction values compared to China. For example, Store New York sold 4490 units across 4005 invoices, which is higher than Store Beijing's 4362 units across 3905 invoices, despite Beijing's much higher revenue. This indicates a difference in pricing or product mix.

At the bottom, a blue bar says "Ask a question and press Enter".

## Example 2: RAG Product Knowledge — Material Information

**Query:** "What material is the Apex Recovery Sweatshirt made of?"

**Depth:** 3 (Deep)

**Tools used:** query\_rag (x1)

### Agent Reasoning Process

The router classifies this as a product knowledge question and routes to the plan-execute-reflect loop.

**Iteration 1 → RAG retrieval:** The agent calls `query_rag` with the question. The RAG tool performs a semantic search over the 635 embedded chunks from 200 product technical sheet PDFs, retrieves the top-5 most relevant chunks, and synthesizes a grounded answer using Gemini 2.5 Flash with structured output.

**Reflect → Satisfied immediately:** The reflect node determines the retrieved data fully answers the question, no additional iterations needed.

### Synthesized Answer:

*"The Apex Recovery Hooded Sweatshirt is made from a premium blend of 78% Cotton and 22% Recycled Polyester."*

The answer includes a Sources section citing `10314.pdf`, the specific product technical sheet PDF the answer was grounded on. Source tracking uses structured output (`RAGResponse`) so the LLM explicitly declares which PDFs it relied on.

The screenshot shows a terminal window titled "Windows PowerShell" with the command "uv run src/gui.py" running. The main interface is titled "Fashion Retail Assistant". It displays a conversation log with the following entries:

- Session**:
  - 2026-02-22 19:39
  - You: What material is the Apex Recovery Sweatshirt made of?
- Tool Step 1: query\_rag**:
  - {  
  "question": "What material is the Apex Recovery Sweatshirt made of?"  
}
- Plan**:
  - Iteration 1
- Reflect**:
  - Reflect: Satisfied
- Assistant**:
  - The Apex Recovery Hooded Sweatshirt is made from a premium blend of 78% Cotton and 22% Recycled Polyester.
- Sources (Product Technical Sheets):**
  - 10314.pdf

At the bottom, there is an input field with the placeholder "Ask a question and press Enter".

## Example 3: Hybrid Query — SQL + RAG Cross-Source Analysis

**Query:** "Whats the material of the 5 most sold products in Germany in 2024?"

**Depth:** 3 (Deep)

**Tools used:** query\_sql (x1) + query\_rag (x5)

### Agent Reasoning Process

This is the most complex query: it requires data from **two completely separate sources** (sales database + product PDF knowledge base) and the agent must chain them together autonomously.

**Iteration 1 → SQL discovery:** The agent calls `query_sql` to find the top 5 products by units sold in Germany, joining transactions, products, and stores tables. Results: Turquoise Sports Printed (108), Short Skirt Of Satin Fabric With Belt (103), High-Sustaining Female Sports Top (100), Sports Jacquard Blue Embroidered (100), Lilac Leather Retro With Pockets (99).

**Reflect → Needs more data:** The reflect node recognizes that sales rankings are complete, but **material information is not in the SQL database** — it exists only in the product technical sheet PDFs. The agent decides to query the RAG tool for each product.

The screenshot shows the 'Fashion Retail Assistant' application interface. At the top, there are tabs for 'Windows PowerShell' and 'uv run src/gui.py'. Below the tabs, the title bar says 'Fashion Retail Assistant'. The main area is divided into several sections:

- Session:** Shows the date and time: 2026-02-22 19:43.
- You:** Shows the user's question: "Whats the material of the 5 most sold products in Germany in 2024?"
- Tool Step 1: query\_sql:** Contains the following JSON code:

```
{  
  "sql": "SELECT p.product_id, p.description_en, SUM(t.quantity) AS total_units_sold FROM transactions t JOIN products p ON t.product_id = p.product_id JOIN stores s ON t.store_id = s.store_id WHERE s.country = 'Germany' AND t.transaction_type = 'Sale' GROUP BY p.product_id, p.description_en ORDER BY total_units_sold DESC LIMIT 5"  
}
```
- Plan:** Shows 'Iteration 1'.
- Reflect:** Contains the following text:

Reflect: Needs more data  
The current data identifies the top 5 most sold products, but it does not include information about their materials. To answer the question, we need to find the material for each of these products.
- Tool Step 2: query\_rag:** Contains the following JSON code:

```
{  
  "question": "What is the material of \"Turquoise Sports Printed\"?"  
}
```
- Tool Step 3: query\_rag:** Contains the following JSON code:

```
{  
  "question": "What is the material of \"Short Skirt Of Satin Fabric With Belt\"?"  
}
```
- Tool Step 4: query\_rag:** Contains the following JSON code:

```
{  
  "question": "What is the material of \"High -Sustaining Female Sports Top\"?"  
}
```
- Input Field:** A text input field at the bottom with the placeholder "Ask a question and press Enter".

**Iteration 2 → Five RAG lookups:** The agent launches 5 separate `query_rag` calls, one per product:

1. "What is the material of Turquoise Sports Printed?"
2. "What is the material of Short Skirt Of Satin Fabric With Belt?"
3. "What is the material of High-Sustaining Female Sports Top?"
4. "What is the material of Sports Jacquard Blue Embroidered?"
5. "What is the material of Lilac Leather Retro With Pockets?"

The screenshot shows a terminal window titled "Windows PowerShell" running "uv run src/gui.py". The title bar says "Fashion Retail Assistant". The terminal content is organized into sections:

- Tool Step 4: query\_rag**  
A JSON object: { "question": "What is the material of \"High -Sustaining Female Sports Top\"?" }
- Tool Step 5: query\_rag**  
A JSON object: { "question": "What is the material of \"Sports Jacquard Blue Embroidered\"?" }
- Tool Step 6: query\_rag**  
A JSON object: { "question": "What is the material of \"Lilac Leather Retro With Pockets\"?" }
- Plan**  
Iteration 2
- Reflect**  
Reflect: Satisfied
- Assistant**  
Here are the materials for the 5 most sold products in Germany in 2024:

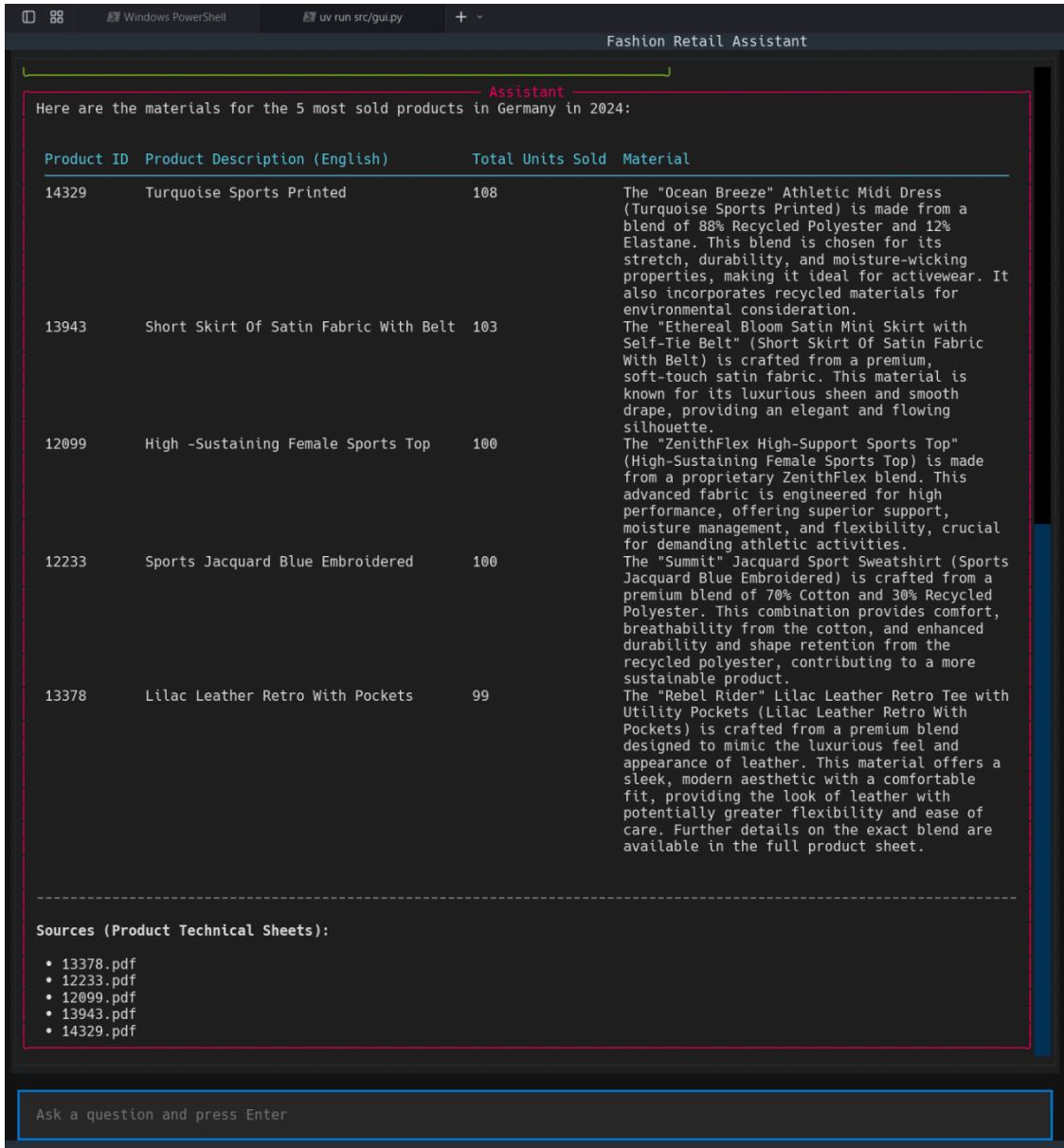
Product ID	Product Description (English)	Total Units Sold	Material
14329	Turquoise Sports Printed	108	The "Ocean Breeze" Athletic Midi Dress (Turquoise Sports Printed) is made from a blend of 88% Recycled Polyester and 12% Elastane. This blend is chosen for its stretch, durability, and moisture-wicking properties, making it ideal for activewear. It also incorporates recycled materials for environmental consideration.
13943	Short Skirt Of Satin Fabric With Belt	103	The "Ethereal Bloom Satin Mini Skirt with Self-Tie Belt" (Short Skirt Of Satin Fabric
- Ask a question and press Enter**

**Reflect → Satisfied:** All 5 RAG lookups returned material data. The agent has both sales rankings (from SQL) and material details (from RAG).

**Synthesized Answer:** The agent produces a unified table combining data from both sources:

Product ID	Product Description	Units Sold	Material
14329	Turquoise Sports Printed	108	88% Recycled Polyester, 12% Elastane
13943	Short Skirt Of Satin Fabric With Belt	103	Premium soft-touch satin fabric
12099	High-Sustaining Female Sports Top	100	Proprietary ZenithFlex blend
12233	Sports Jacquard Blue Embroidered	100	70% Cotton, 30% Recycled Polyester
13378	Lilac Leather Retro With Pockets	99	Premium leather-mimic blend

Sources cited: [13378.pdf](#), [12233.pdf](#), [12099.pdf](#), [13943.pdf](#), [14329.pdf](#) — one PDF per product, all verified.



The screenshot shows a terminal window titled "Windows PowerShell" with the command "uv run src/gui.py" running. The title bar of the application window says "Fashion Retail Assistant". The main content area displays a table titled "Assistant" with the following text: "Here are the materials for the 5 most sold products in Germany in 2024:". The table has columns: Product ID, Product Description (English), Total Units Sold, and Material. The data is as follows:

Product ID	Product Description (English)	Total Units Sold	Material
14329	Turquoise Sports Printed	108	The "Ocean Breeze" Athletic Midi Dress (Turquoise Sports Printed) is made from a blend of 88% Recycled Polyester and 12% Elastane. This blend is chosen for its stretch, durability, and moisture-wicking properties, making it ideal for activewear. It also incorporates recycled materials for environmental consideration.
13943	Short Skirt Of Satin Fabric With Belt	103	The "Ethereal Bloom Satin Mini Skirt with Self-Tie Belt" (Short Skirt Of Satin Fabric With Belt) is crafted from a premium, soft-touch satin fabric. This material is known for its luxurious sheen and smooth drape, providing an elegant and flowing silhouette.
12099	High -Sustaining Female Sports Top	100	The "ZenithFlex High-Support Sports Top" (High-Sustaining Female Sports Top) is made from a proprietary ZenithFlex blend. This advanced fabric is engineered for high performance, offering superior support, moisture management, and flexibility, crucial for demanding athletic activities.
12233	Sports Jacquard Blue Embroidered	100	The "Summit" Jacquard Sport Sweatshirt (Sports Jacquard Blue Embroidered) is crafted from a premium blend of 70% Cotton and 30% Recycled Polyester. This combination provides comfort, breathability from the cotton, and enhanced durability and shape retention from the recycled polyester, contributing to a more sustainable product.
13378	Lilac Leather Retro With Pockets	99	The "Rebel Rider" Lilac Leather Retro Tee with Utility Pockets (Lilac Leather Retro With Pockets) is crafted from a premium blend designed to mimic the luxurious feel and appearance of leather. This material offers a sleek, modern aesthetic with a comfortable fit, providing the look of leather with potentially greater flexibility and ease of care. Further details on the exact blend are available in the full product sheet.

**Sources (Product Technical Sheets):**

- [13378.pdf](#)
- [12233.pdf](#)
- [12099.pdf](#)
- [13943.pdf](#)
- [14329.pdf](#)

Ask a question and press Enter