

Skill Up on Snowflake

In collaboration with DataCamp

3 Online Learning Tracks Available

Snowflake Foundations

Associate Data Engineer in Snowflake

Snowflake AI Fundamentals



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[BUILD]

The Dev Conference for AI & Apps

BUILDING INTELLIGENT DATA APPLICATIONS WITH SNOWFLAKE



Learning Objectives

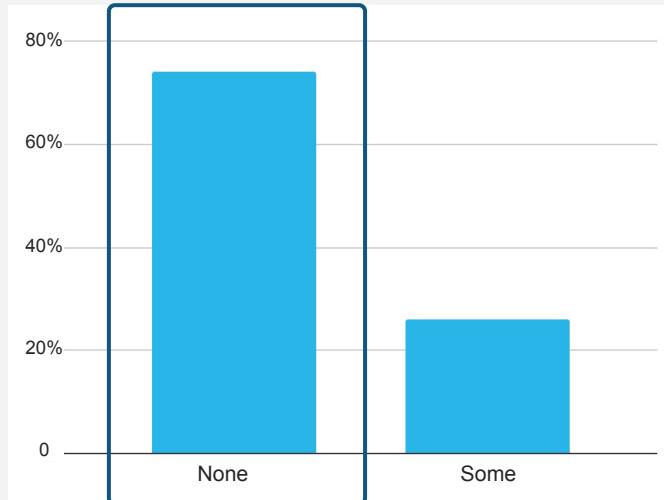
- Explain the fundamentals and architecture of Snowflake.
- Identify and describe key features of Snowflake Intelligence.
- Understand the components of Snowflake Cortex.
 - Leverage Cortex Search for data discovery and retrieval.
 - Utilize Cortex Analyst for advanced data analysis tasks.
- Build and deploy User-Defined Functions (UDFs).
- Apply Snowflake Intelligence Agents.



Industry Challenge: Getting Gen AI Apps into Production

Most LLM apps are not yet in production

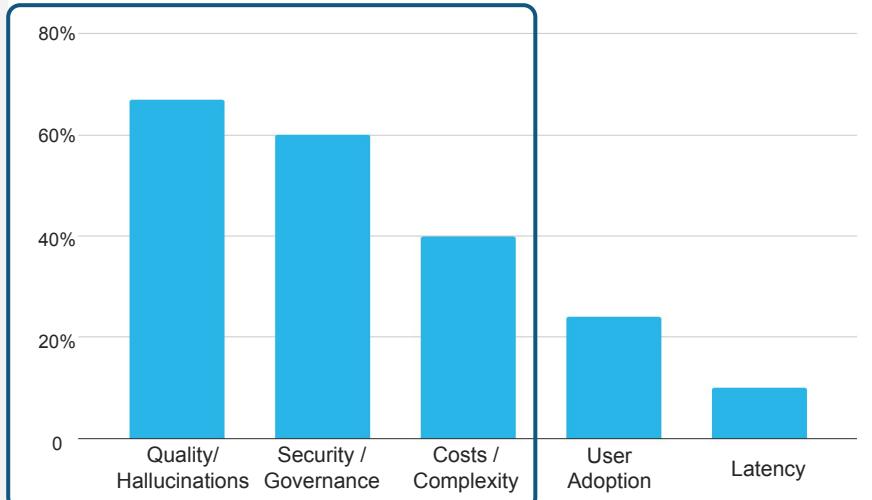
% of an Organization's LLM Apps in Production Today



Source: Industry Survey Results, Jan 2024

Quality, governance, and cost issues are top challenges.

Responses to Question - What are your top challenges in getting LLM apps to production?



Source: Industry Survey Results, Jan 2024



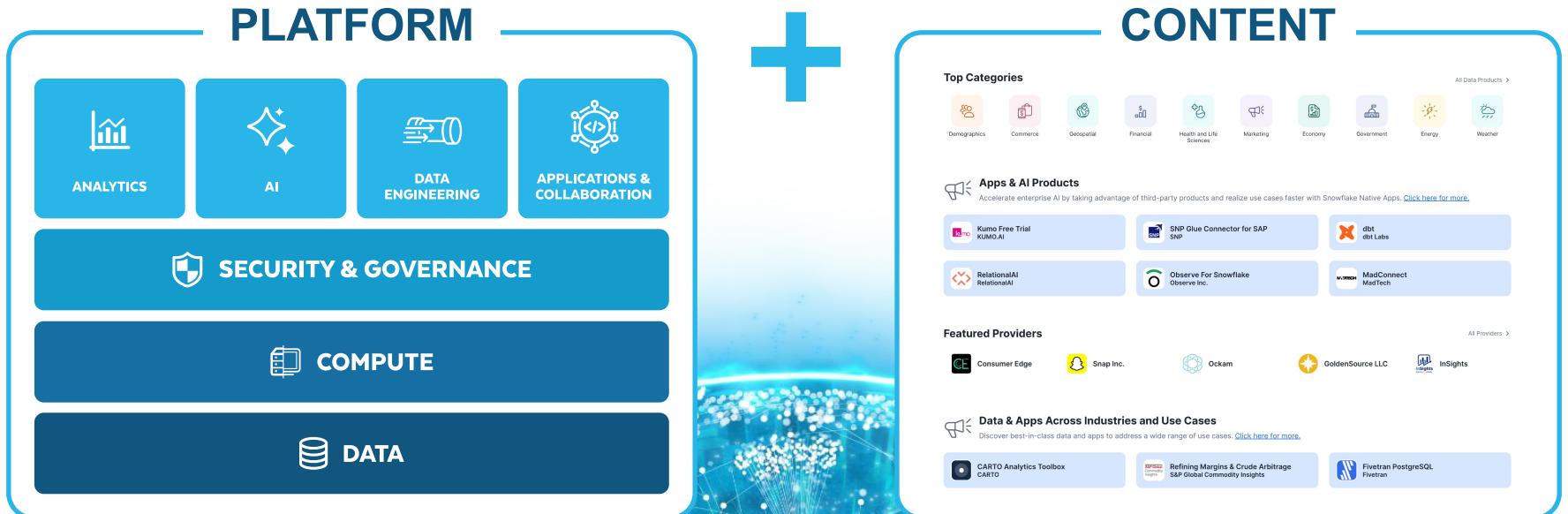
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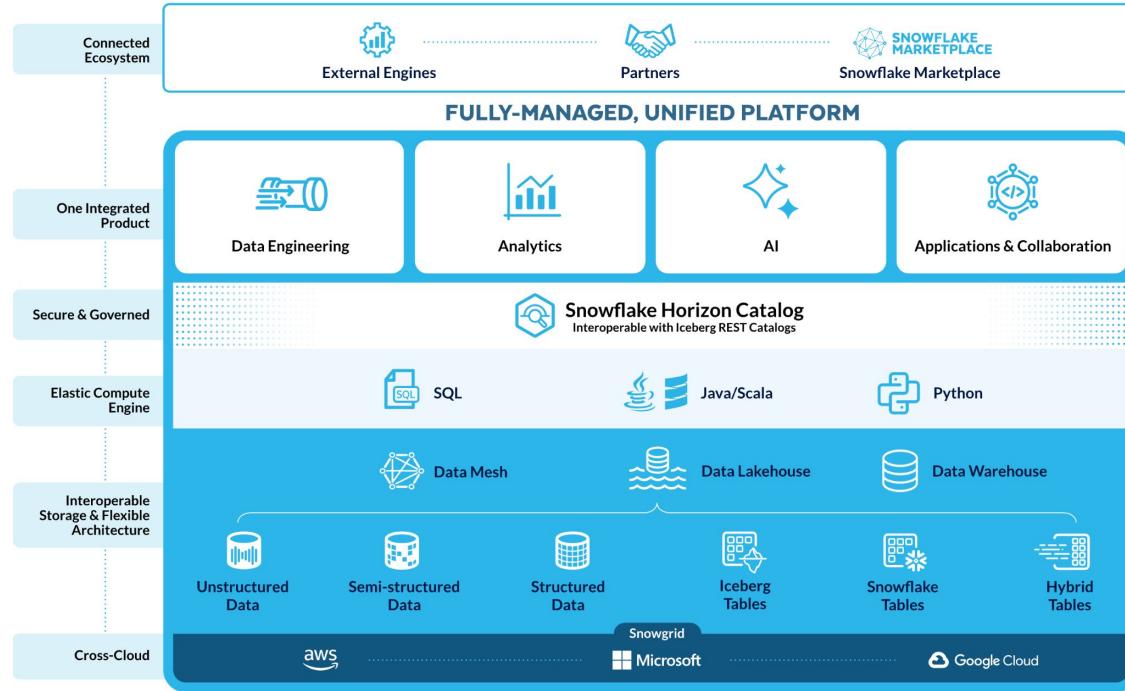
**THERE IS NO AI STRATEGY,
WITHOUT A DATA STRATEGY**



Snowflake: The AI Data Cloud



Snowflake Platform Architecture



BRING AI TO YOUR DATA

Reduce complexity and optimize across quality and cost

BUILT-IN GOVERNANCE

Secures both data & AI models

SOLID DATA FOUNDATION

Helps improve quality & reduce hallucinations



Cortex AI: Making Gen AI Easy, Connected, and Trusted

POWERFUL AI APPS

No-code, powerful AI apps for code assistance, document understanding, and chatbots

TALK TO YOUR DATA

State of the art Search and Text2SQL capabilities to build BI and AI chatbots easily

MODELS

Top tier models, easily accessible, fully managed, tightly integrated, all inside of Snowflake



Snowflake Cortex AI

AGENTS & INSIGHTS

Agent Apps
Snowflake Intelligence

Agent APIs
Cortex Agents

Multimodal AI-powered SQL
Cortex AISQL

PROCESSING & RETRIEVAL

Unstructured Data Retrieval
Cortex Search

Structured Data Retrieval
Cortex Analyst

Document Processing
Document AI, Parse, Embed

DATA

Data Connectors
Openflow



AI Ready Data & Apps
Snowflake Marketplace



Multimodal Data
Snowflake, External



MODELS



ANTHROPIC



MISTRAL AI



Inference &
Fine-Tuning APIs

Embedding Models

GOVERNANCE

RBAC

Guardrails

Evaluations

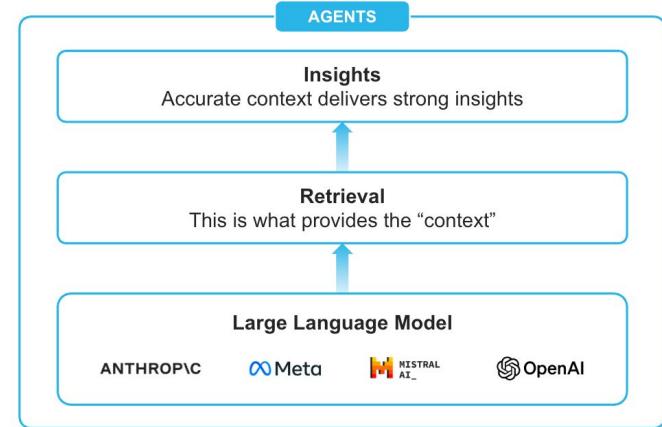
Monitoring

AI Gateway



Introducing Snowflake Intelligence

- Agentic AI platform with autonomous data agents
- Conversational interface for business insights
- Empowers non-technical users
- Natural language querying
 - No SQL required
- Built on enterprise LLMs (GPT-4, Claude, Arctic)
- Pre-built agents for immediate deployment



Discussion: What are some challenges that you would see with adoption of Snowflake Intelligence?



MODULE 1: SETTING UP



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Snowflake Account

- Snowflake offers a free 30-day trial
- \$400 worth of free usage
 - Select AWS and US West
- Including access to new features like Snowflake Intelligence

- Claim Snowflake's free trial by:
 - Scanning this QR Code
 - Visiting mlh.link/snowflake-ai-trial



Checkpoint: Account Created

The screenshot shows the Snowflake Home page. On the left, there's a sidebar with navigation links like 'Work with data', 'Projects', 'Ingestion', 'Transformation', 'AI & ML', 'Monitoring', 'Marketplace', 'Horizon Catalog', 'Catalog', 'Data sharing', 'Governance & security', 'Manage', 'Compute', and 'Admin'. A trial message at the bottom says '\$400 credits left' and 'Trial ends in 30 days' with an 'Upgrade' button.

The main area has a dark background with white text. It starts with 'Welcome to Snowflake! How do you want to start?'. There are two main options:

- Explore a sample data set**: This option shows a small icon of a food truck and a brief description about TastyBytes. It includes a 'Start' button.
- Load data into Snowflake**: This option shows a cloud icon with an upward arrow and a list of sources: 'Local files', 'External cloud providers', and '3rd party connectors (20+ providers)'. It also includes a 'Start' button.

A horizontal line separates these from a section titled 'OR'. Below this, there are three cards:

- Load sample data from AWS S3 with SQL**: Shows a 'Skip for now' button.
- Analyze sentiment in unstructured data**: Shows a 'Skip for now' button.
- Overview of Snowpark DataFrames**: Shows a 'Skip for now' button.



Data Ingestions

➤ Snowflake data ingestion methods

- Local Files
- S3 Buckets
- Data Connectors
- Data Marketplace
- Many Additional Methods

Add data
Bring your data into Snowflake

Load data into a Table Load files into a Stage Snowflake Stage

AWS S3 Microsoft Azure Blob Storage Google Cloud Storage

Learn how to get data from a URL Learn about Snowpipe Streaming Snowflake Marketplace

Snowflake Connector for ServiceNow Snowflake Connector for Google Analytics Aggregate Data Snowflake Connector for Google Analytics Raw Data

Snowflake Connector for MySQL Snowflake Connector for PostgreSQL SNP Glue Connector for SAP



Sample Dataset

- LifeStyle Brand
 - Marketing Campaign Metrics
 - Products
 - Sales
 - Social Media Mentions
 - Support Cases

- Get our sample dataset by:
 - Scanning this QR Code
 - Visiting mlh.link/snowflake-data



Checkpoint: Dataset Loaded

The screenshot shows the Snowflake Database Explorer interface. On the left, the sidebar includes sections for Work with data (Projects, Ingestion, Transformation, AI & ML, Monitoring, Marketplace), Horizon Catalog (Catalog, Data sharing, Governance & security), Manage (Compute, Admin), and a trial status (\$400 credits left, Trial ends in 30 days, Upgrade button). The main area is titled "Database Explorer HORIZON CATALOG" and shows the "Databases" section with "DASH_DB_SI" selected. Under "Tables", the "RETAIL" database is expanded, showing tables: MARKETING_CAMPAIGN_METRICS, PRODUCTS, SALES, SOCIAL_MEDIA, and SUPPORT_CASES. Other sections include Stages (SEMANTIC_MODELS, SWT_MARKETING_DATA_STAGE, etc.), File Formats, and Procedures. The right panel displays the "Schema Details" for the "DASH_DB_SI / RETAIL" schema, specifically the "Tables" tab, which lists five tables with columns for NAME, TYPE, OWNER, ROWS, BYTES, and COLUMNS. The "SOCIAL_MEDIA" table has 14.6K rows and 8 columns.

NAME	T ^Y	OWNER	RO...	B1	C...
MARKETING_CAMPAIGN_METRICS	T...	SNOWFLAKE_INTELLIGENCE...	23	2...	5 ...
PRODUCTS	T...	SNOWFLAKE_INTELLIGENCE...	40	2...	5 ...
SALES	T...	SNOWFLAKE_INTELLIGENCE...	14.6K	8...	5 ...
SOCIAL_MEDIA	T...	SNOWFLAKE_INTELLIGENCE...	273	3...	5 ...
SUPPORT_CASES	T...	SNOWFLAKE_INTELLIGENCE...	30	2...	4 ...



MODULE 2: CORTEX SEARCH

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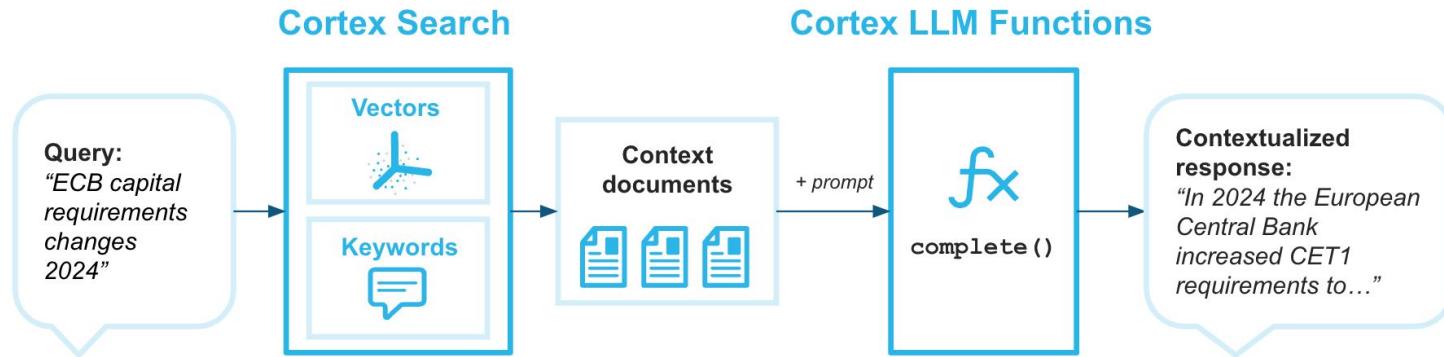
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What is Cortex Search?

- Retrieve unstructured data through combined vector and keyword search.
- Provides Retrieval-Augmented Generation (RAG) to enrich LLM applications.
- Zero infrastructure required with complete Snowflake management
- Integrate seamlessly using SQL, Python, REST API, or Snowsight.



Cortex Search

The screenshot shows the Cortex Search interface within the Snowflake web application. The left sidebar is dark-themed and includes sections for Work with data (Projects, Ingestion, Transformation), AI & ML (Monitoring, Marketplace, Horizon Catalog, Catalog, Data sharing, Governance & security), Manage (Compute, Admin), and a trial status message (\$400 credits left, Trial ends in 30 days, Upgrade button). The main content area has a light background and displays the Cortex Search PREVIEW page. It features a 'Why use Cortex Search?' section with a link to 'Tutorials' and a 'Build performant, high-quality search bars and RAG chatbots on unstructured data.' callout. To the right is a 'Cortex Search Documentation' section with links to 'Learn more about creation, usage, and management of Cortex Search Services.' and 'Documentation'. A central navigation bar labeled 'Studio' contains links to Cortex Analyst, Cortex Search (which is currently selected), Features, Models, Evaluations, Document AI, Agents, and Snowflake Intelligence. A search bar shows '0 search services'. At the bottom, a message 'No data available' is displayed.



Checkpoint: Cortex Search - Support Cases

The screenshot shows the Snowflake web interface with the Cortex Search feature. The left sidebar has a dark theme with the following navigation items:

- Work with data
 - Projects
 - Ingestion
 - Transformation
 - AI & ML** (selected)
 - Monitoring
 - Marketplace
- Horizon Catalog
 - Catalog
 - Data sharing
 - Governance & security
- Manage
 - Compute
 - Admin

A banner at the bottom indicates "\$235 credits left" and "Trial ends in 15 days" with an "Upgrade" button.

The main area is titled "Cortex Search > Playground PREVIEW". It shows a search bar with placeholder "Search" and a dropdown menu set to "DASH_DB.SI.RETAIL.SUPPORT_CASE". To the right is a "Settings" panel with the following configuration:

- Parameter**: A text input field with "10" entered, with a note below: "Please enter a number between 1 and 1000".
- Columns**: A dropdown menu set to "TRANSCRIPT".
- Filter**: A section with a "Basic" tab selected and a "JSON" tab, with a "Add condition" button.

The center of the screen displays the results for the query "SUPPORT_CASE". It features a large blue magnifying glass icon and the text "Query search service". Below this, there is a table or list of results, which is currently empty.



MODULE 3: CORTEX ANALYST

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What is Cortex Analyst?

- AI-driven natural-language queries over structured data
- Automatic generation of analyses, visualizations, and insights
- Plain-language explanations of results
- Zero infrastructure required with complete Snowflake management
- Integrate seamlessly using SQL, Python, REST API, or Snowsight.



Cortex Analyst

The screenshot shows the Cortex Analyst interface within the Snowflake web application. The left sidebar has a dark theme with white text and icons. The 'AI & ML' section is currently selected, with its sub-options visible in a dropdown menu:

- Studio
- Cortex Analyst
- Cortex Search
- Features
- Models
- Evaluations
- Document AI
- Agents
- Snowflake Intelligence

The main content area is titled 'Cortex Analyst' and displays the message 'Select database to see semantic views'. Below this, a button says 'No Database selected'. At the bottom of the main area, there is a large trash can icon.

In the bottom right corner of the main area, there is a small circular icon with a question mark inside it.

The bottom left of the screen shows a promotional banner for credits and trial status:

- \$400 credits left
- Trial ends in 30 days
- [Upgrade](#)

The bottom center shows the user's profile information: Kevin Chen, ACCOUNTADMIN.



Checkpoint: Cortex Analyst - Marketing Campaign

The screenshot shows the Snowflake AI & ML interface with a semantic model named `marketing_campaigns.yaml`.

Semantic Model: `marketing_campaigns.yaml`

SEMANTIC_MODELS > marketing_campaigns.yaml

Sales_And_Marketing_Data

Custom Instructions

Logical tables (4)

- MARKETING_CAMPAIGN_METRICS**
This table stores key performance metrics for marketing campaigns, including the date, category, and name of the campaign, as well as the number of impressions (views) and clicks the campaign received.
- Dimensions (2)**
- Time Dimensions (1)**
- Facts (2)**
- Named Filters (0)**
- Metrics (0)**

PRODUCTS

The PRODUCTS table stores information about the various products offered by a company, with each product uniquely identified by a PRODUCT.ID. The table captures the name of each product (PRODUCT_NAME) and the category it belongs to (CATEGORY), allowing for organization and classification of products for inventory management, sales tracking, and other business purposes.

PAGE ACTIONS

- Sales_And_Marketing_Data**
 - Explain the dataset
- Enter prompt** (with a Run button)

ACCOUNTADMIN COMPUTE_WH (X-Small)

PREVIEW Suggestions Playground

Save

Valid semantic model. Ready to answer your questions.

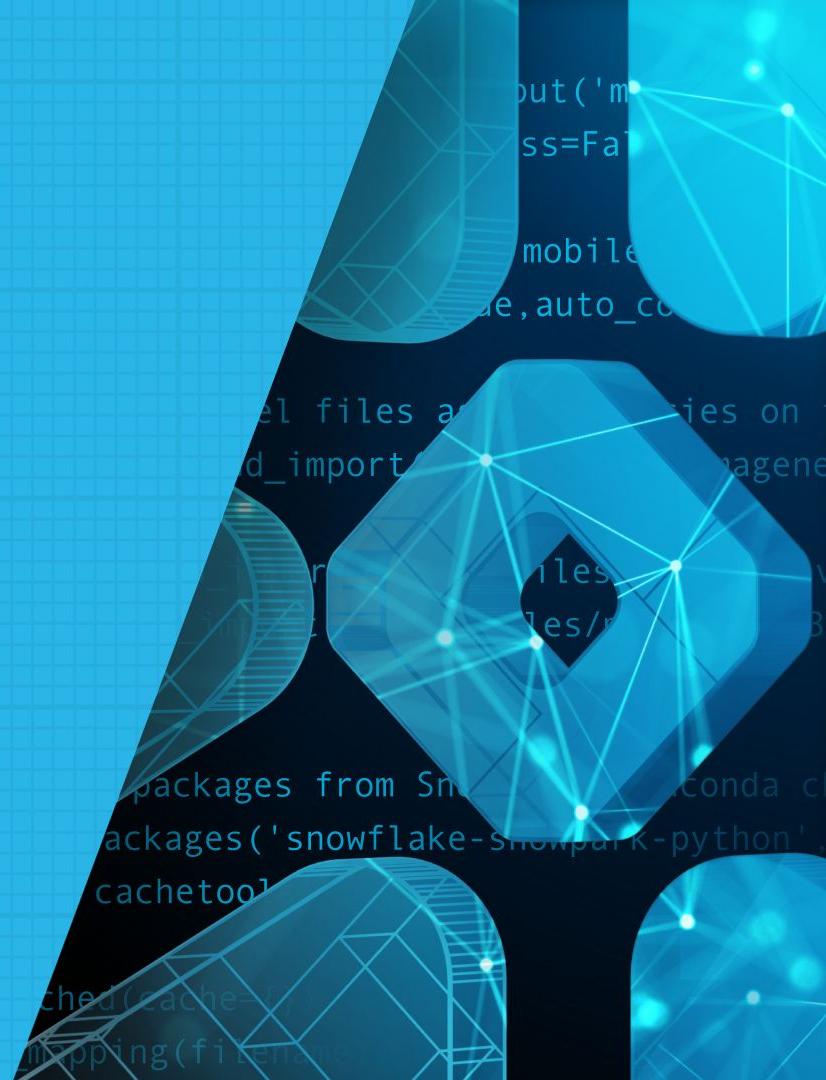


MODULE 4: USER DEFINED FUNCTIONS

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What are User Defined Functions?

- Custom SQL invocable routines
- Extends Snowflake's built-in functions
- With many different supported methods and languages
- Example uses
 - Data cleaning
 - Complex calculations
 - Text processing
 - And much more

```
CREATE OR REPLACE FUNCTION addone(i INT)
RETURNS INT
LANGUAGE PYTHON
RUNTIME_VERSION = '3.12'
HANDLER = 'addone_py'
AS $$
def addone_py(i):
    return i+1
$$;
```



UDF/UDTF Examples

- > Simple UDF/UDTF
 - Written in Python
 - Written in SQL
- > Use them to create new tables
- > Get the UDF/UDTF we will be using by:
 - Scanning this QR Code
 - Visiting mlh.link/snowflake-udf



Checkpoint: UDF/UDTF

The screenshot shows the Snowflake Database Explorer interface. On the left, the sidebar includes options like Work with data, Catalog (which is selected), and Data sharing. The main area, titled "Database Explorer HORIZON CATALOG", shows a tree view of databases and schemas. Under the "RETAIL" schema, the "PRODUCTS_WITH_AVG_PRICE" table is selected and highlighted in blue. To the right, a detailed view of this table is shown with the "Data Preview" tab selected. The preview shows 40 rows of data with columns: PRODUCT_ID, PRODUCT_NAME, CATEGORY, and AVG_PRICE. The data includes various fitness items and casual wear items across different price points.

	PRODUCT_ID	PRODUCT_NAME	CATEGORY	AVG_PRICE
1	1	Fitness Item 1	Fitness Wear	59.48
2	2	Fitness Item 2	Fitness Wear	60.66
3	3	Fitness Item 3	Fitness Wear	58.25
4	4	Fitness Item 4	Fitness Wear	59.86
5	5	Fitness Item 5	Fitness Wear	59.57
6	6	Fitness Item 6	Fitness Wear	59.91
7	7	Fitness Item 7	Fitness Wear	57.88
8	8	Fitness Item 8	Fitness Wear	59.71
9	9	Fitness Item 9	Fitness Wear	59.20
10	10	Fitness Item 10	Fitness Wear	60.76
11	11	Casual Item 1	Casual Wear	58.90
12	12	Casual Item 2	Casual Wear	60.83
13	13	Casual Item 3	Casual Wear	60.79
14	14	Casual Item 4	Casual Wear	59.99
15	15	Casual Item 5	Casual Wear	60.90
16	16	Casual Item 6	Casual Wear	58.89
17	17	Casual Item 7	Casual Wear	59.08
18	18	Casual Item 8	Casual Wear	61.26
19	19	Casual Item 9	Casual Wear	58.44
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MODULE 5: SNOWFLAKE INTELLIGENCE

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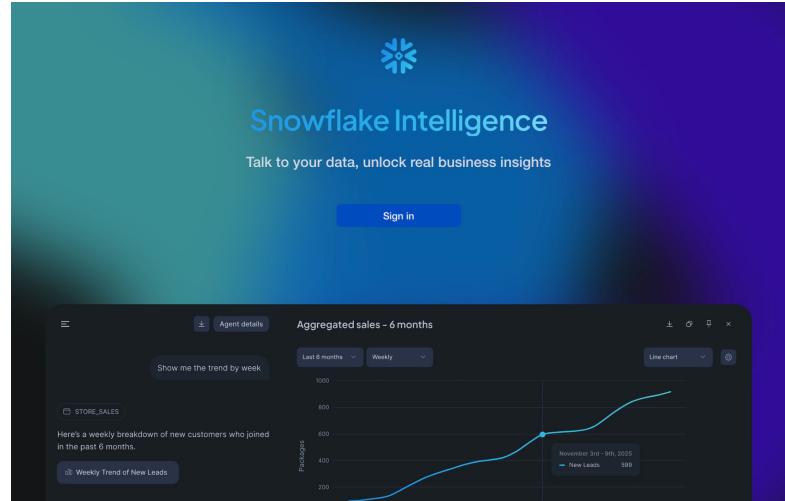
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Custom Snowflake Intelligence

- Create Snowflake Agent
- Create Tools
 - Cortex Search (Unstructured Data)
 - Cortex Analyst (Structured Data)
 - User Defined Functions (Custom Tool)
- All Powered by LLM



Checkpoint: Custom Snowflake Intelligence Agent

The screenshot shows the Snowflake AI interface with a custom intelligence agent named "SALES_AI".

Snowflake AI Tools:

- Cortex Analyst:** Semantic view: @DASH_DB_SI.RETAIL.SEMANTIC_MODELS/marketing, Query timeout: 60s. TABLE1: MARKETING_CAMPAIGN_METRICS - Database: DASH_DB_SI, Schema: RETAIL.
- Cortex Search Services:** SUPPORT_CASES, Service name: DASH_DB_SI.RETAIL.SUPPORT_CASES.
- Custom tools:** ROUND_FLOAT_TO_WHOLE, Procedure name: ROUNDTOWHOLE(FLOAT), PROCEDURE/FUNCTION DETAILS: - Type: User-Defined Function (UDF).

SALES_AI Agent Interface:

- Header:** SALES_AI, Tools tab selected.
- Buttons:** Cancel, Save.
- Text:** This AI Agent can answer all your sales data related questions!
- Input Fields:** Show me the trend of sales by product category between Jun..., What issues are reported with jackets recently in customer su..., Why did sales of Fitness Wear grow so much in July?
- Text Area:** Enter a message to test your agent.
- Buttons:** Research, Up.

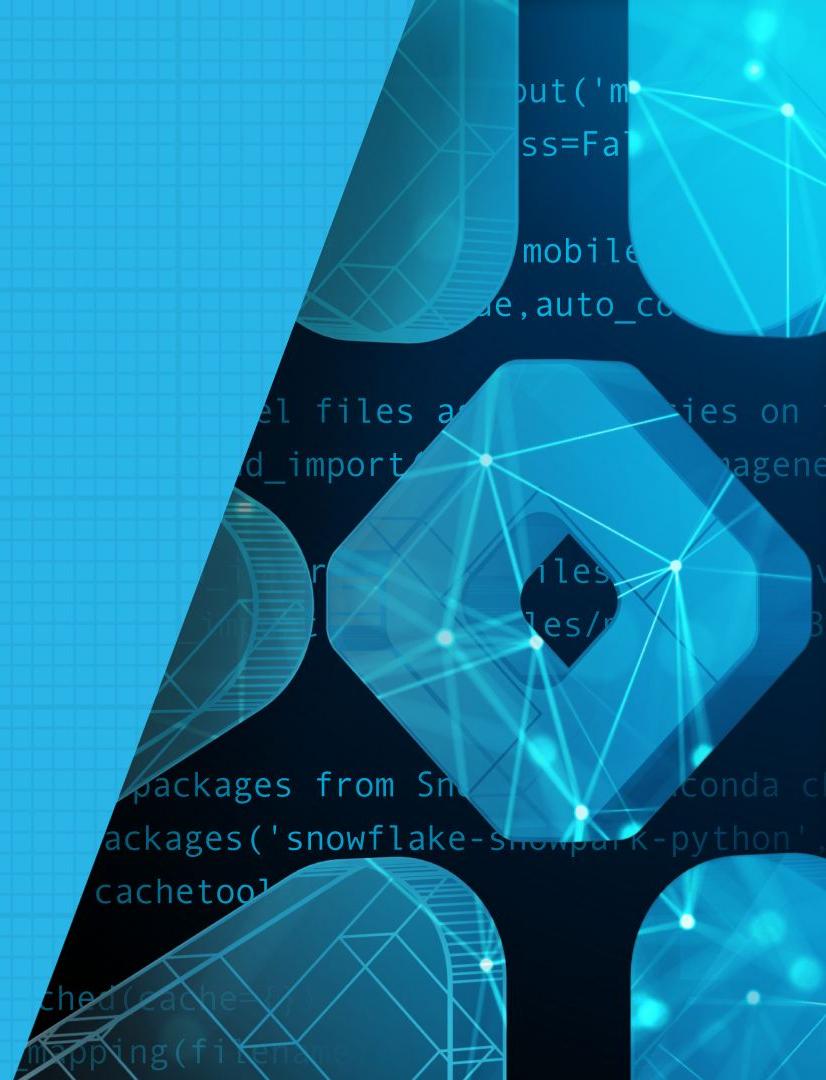


MODULE 6: SNOWFLAKE BADGE

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Earn a Snowflake Badge!



Criteria:

1. Make sure you have registered/checked-in with the Snowflake team
2. Successfully complete the hands-on lab!

NOTE: Badges will be sent via email **within 7 business days** of completing the workshop



Ready for your Snowflake Badge?

- Run setup script for the Autograder
- Update the autograding script
- Run the autograding scripts
- Get your Snowflake Badge

When setting up the autograder,
use the SAME email you used to
register for the event.

For help, reach out to
developer-badges-DL@snowflake.com



Run the Autograder

Autograder Setup



mlh.link/snowflake-autograder

Autograder Scripts



mlh.link/snowflake-autograding-scripts



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THANK YOU



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