

# Assignment 1

## Snowflake Data Upload and Retrieval using Python and Snowflake Data Visualization

Below are the step-by-step instructions to call the API using Python, upload data to Snowflake, and visualize the data.

### Setting Up a Snowflake Account

- 1] Open the [Snowflake Signup Page](#) and create a free-tier account by entering your basic information. Click **Continue**.

The screenshot shows the Snowflake sign-up page with a teal background. On the left, there's a large "START YOUR 30-DAY FREE TRIAL" button. To its right, text reads "Start your 30-day free Snowflake trial which includes \$400 worth of free usage". Below this are several input fields with dropdown arrows: "Prasad" (checked), "Katkade" (checked), "prasad.katkade@utexas.edu" (checked), "Student" (checked), "Student" (unchecked), and "United States" (unchecked). At the bottom, a note states: "By clicking the button below you understand that Snowflake will process your personal information in accordance with its [Privacy Notice](#)". A large orange "CONTINUE" button is at the bottom right, with "or [sign in to an existing account](#)" written below it. Logos for PCI DSS, HIPAA, SOC 2, and FedRAMP are visible at the bottom left.

2] Choose **Snowflake Account Type** as **Standard** and select **Cloud Provider** as **AWS** (you may choose any).

- For this tutorial, select **AWS** and **Region: US East (Ohio)**.
- Review the **Terms and Conditions**, then click **Get Started**.

# START YOUR 30-DAY FREE TRIAL

Start your 30-day free Snowflake trial which includes \$400 worth of free usage

Choose your Snowflake edition\*

**Standard**  
A strong balance between features, level of support, and cost.

**Enterprise**  
Standard plus 90-day time travel, multi-cluster warehouses, and materialized views.

**Business Critical**  
Enterprise plus enhanced security, data protection, and database failover/fallback.

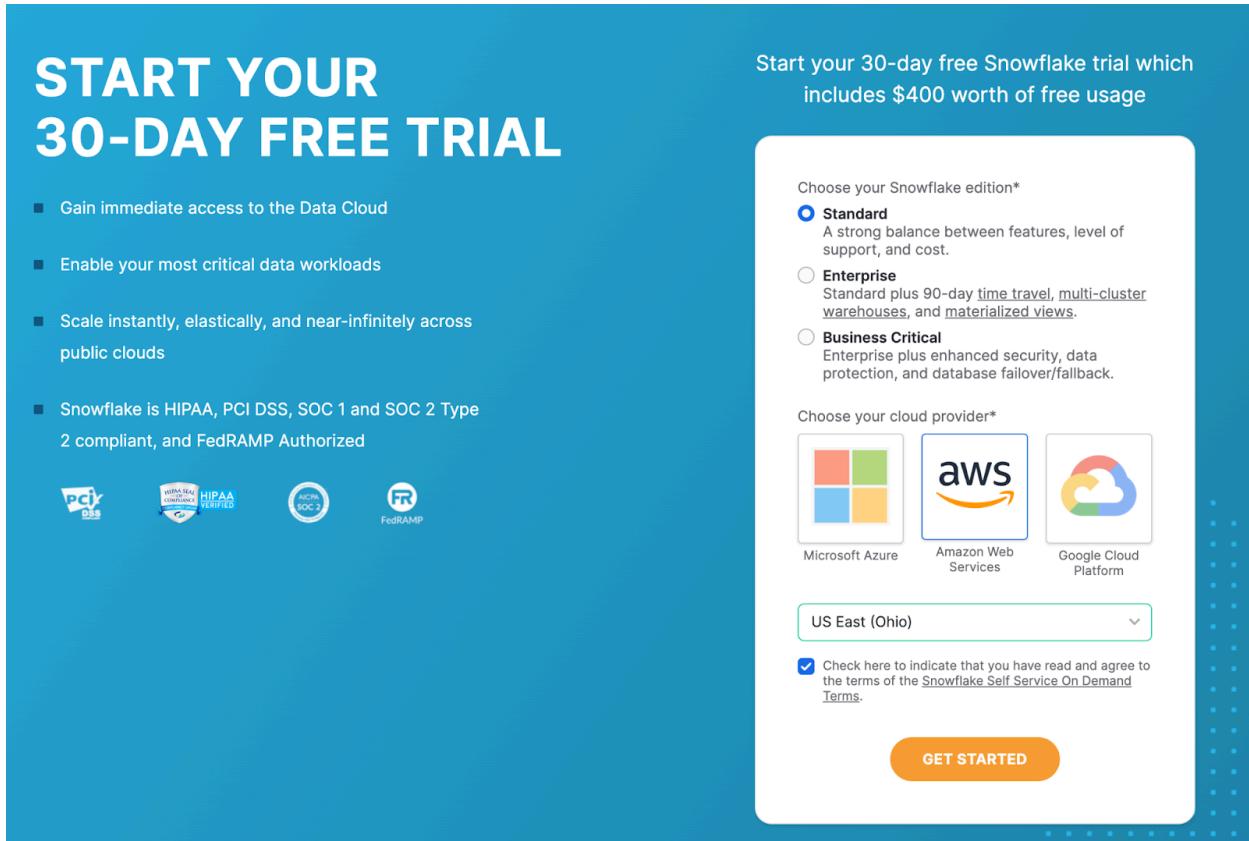
Choose your cloud provider\*

 Microsoft Azure     Amazon Web Services     Google Cloud Platform

US East (Ohio) ▾

Check here to indicate that you have read and agree to the terms of the [Snowflake Self Service On Demand Terms](#).

**GET STARTED**



3] Choose the reason for using Snowflake as **Personal Training & Development**. Select your **Preferred Language** and reason for using Snowflake (you may choose as per your preference). Click **Submit**.



## START YOUR 30-DAY FREE TRIAL

- Gain immediate access to the Data Cloud
- Enable your most critical data workloads
- Scale instantly, elastically, and near-infinitely across public clouds
- Snowflake is HIPAA, PCI DSS, SOC 1 and SOC 2 Type 2 compliant, and FedRAMP Authorized



Start your 30-day free Snowflake trial which includes \$400 worth of free usage

### Thanks for signing up with Snowflake!

Help us better serve you by answering these questions.

#### Why are you signing up for a trial?

- Company is considering Snowflake
- Personal learning and development
- Training or Certification
- Other

Skip

Continue

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### Thanks for signing up with Snowflake!

Help us better serve you by answering these questions.

#### Select your preferred language(s) to work in

- Scala
- Python
- SQL
- Java
- No coding language experience
- Other [Tell us more](#)

Skip

Continue

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Help us better serve you by answering these questions.

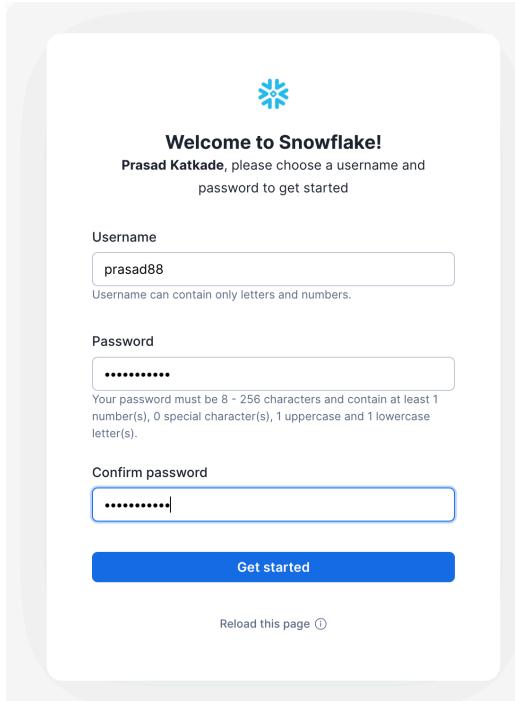
#### What will you use Snowflake for?

- Load data, build a data pipeline or migrate an existing warehouse
- Use Snowflake Cortex AI to run LLMs, build RAG apps, and deploy ML models
- Build or train a machine learning model
- Use Snowflake as a data warehouse and data lake
- Build or distribute an application with Snowflake
- List or buy data from the Snowflake marketplace
- Run data analysis and build visualizations

Skip

Submit

4] Check your email and activate your account. Set up your **Username** and **Password**.



5] You will be redirected to your **Snowflake Dashboard**, where you can find your **Free Tier Credits** at the bottom left.

Home

Feedback

Search this account, Marketplace, and documentation

Quick actions

- Upload local files
- Load from cloud storage
- Query data
- Create User

Get started with tutorials

- Account setup (10 min)
- Load sample data from S3 (30 min)
- Load data from cloud storage (5 min)
- Creating users with SQL (15 min)
- Cost and performance
- Intro to managing compute resources

\$400 credits left

Trial ends in 30 days

Upgrade

Recently viewed

All projects Worksheets Notebooks Streamlit Dashboards Folders

Create your first project

You can start querying in SQL, develop workflows, or visualize data insights.

Prasad Katkade ACCOUNTADMIN

# Creating a Snowflake Database

1] From the side navigation, go to **Data → Database**. Click on the **Create Database** button (top right) and provide a database name: **TEST** (use capital letters for naming conventions).

The screenshot shows the Snowflake web interface. On the left, the sidebar has 'Databases' selected. In the center, a modal window titled 'New Database' is open, showing the input field 'Name' with 'TEST' typed into it. Below the name field is a 'Comment (optional)' input field which is empty. At the bottom of the modal are two buttons: 'Cancel' and 'Create'. To the right of the modal, the main content area displays a table of databases. The table has columns for 'OWNER', 'CREAT...', and three more columns that are mostly blank or show '21 min...'. The first database listed is 'ACCOUNTADMIN'.

2] You can now access the database. Your tables will be listed under the **Public** schema. Since this is a new database, it won't have any tables initially. Your **Access Role** will be set to **ACCOUNTADMIN** by default.

The screenshot shows the Snowflake web interface. The left sidebar is identical to the previous screenshot, with 'Databases' selected. The main content area shows the 'TEST' database expanded. Under the 'TEST' database, the 'PUBLIC' schema is selected and highlighted with a blue background. Below the schema, it says 'No Objects found'. To the right, a detailed view of the 'TEST / PUBLIC' schema is shown. It includes sections for 'Schema Details' and 'Privileges'. Under 'Privileges', it shows 'ACCOUNTADMIN (Current Role)' and 'OWNERSHIP'. There are also buttons for 'Group by Role' and '+ Privilege'.

# Getting Snowflake Credentials for Connection

1] Open a **Notepad** and write down the following details:

```
user=' ', # Username  
password=' ', # Password to your snowflake account  
account=' ', # Account URL ID  
warehouse='COMPUTE_WH', # Warehouse ID (Default)  
database='TEST', # Database Name  
schema='PUBLIC', # Schema Type PUBLIC (Default)  
role='ACCOUNTADMIN' # Access role - ACCOUNTADMIN (Default)
```

Fill in your **User (Username)** and **Password** (same as used for login).

To find your **Account ID**:

- Navigate to **Admin → Accounts Tab** from the side navigation.
- Hover over the **info icon** next to your **Account ID**.
- Since the column does not display the full **Account ID**, copy the **Account ID** from the **current URL**: <https://{Account ID}.snowflakecomputing.com>
- Paste the copied **Account ID** into the **Notepad**.

The screenshot shows the Snowflake web interface. On the left, the sidebar includes links for Create, Home, Search, Projects, Data, Data Products, AI & ML, Monitoring, Admin (which is selected), Cost Management, Warehouses, Compute Pools, Users & Roles, Accounts (which is highlighted in blue), and Security. The main content area is titled "Accounts Replication" with a "PREVIEW" button. It shows two tabs: "Active Accounts" (selected) and "Dropped Accounts". Below the tabs are filters for Search Account, Edition All, Cloud All, Region All, and a count of 1 Account. A table header with columns ACCOUNT, EDITION, CLOUD, and REGION is shown. One row in the table is highlighted, displaying AE79467, Standard, AWS, and US East (Ohio). A tooltip over the "Current URL" field shows the URL <https://wcaxzuv-ae79467.snowflakeco...>.

2] The **Warehouse ID** can be found under the **Warehouses Tab**.

- The default warehouse "**COMPUTE\_WH**" is created during account setup.

# Connection with the python script to upload and retrieve data.

1] For this assignment, install the following four essential Python libraries:

Head to the terminal and download the following packages - (**Use pip for windows, pip3 for mac**)

- **Pandas** - For computing and managing data-frames
  - Command - *pip3 install pandas*
- **Snowflake Connector Python** - For setting up connection between Snowflake account and python
  - Command - *pip3 install snowflake-connector-python*
- **Snowflake Pandas** - for uploading and retrieving data from Snowflake
  - Command - *pip3 install "snowflake-connector-python[pandas]"*
- **requests** - for calling the service API, this package comes as default with python no need to install

2] Download the **Python Notebook** from here - [[Assign1.ipynb](#)]

3] Fill in your **Snowflake Credentials** in the notebook as copied from **Notepad**.

```
Connect to your snowflake account using snowflake connector library

conn = snowflake.connector.connect(
    user='', # Username
    password='', # Password to your snowflake account
    account=' ', # Account URL ID
    warehouse='COMPUTE_WH', # Warhouse ID
    database='TEST', # Database Name
    schema='PUBLIC', # Schema Type Def - PUBLIC
    role='ACCOUNTADMIN' # Access role - ACCOUNTADMIN
)
```

4] Select the **Python Environment** installed on your system (Make sure you have Jupyter Extension installed in Vs Code).

- Click **Run All** to execute the entire notebook or run each section step by step.
- Observe how the data gets uploaded and retrieved.

+ Code + Markdown | ▶ Run All ⏪ Restart ⏴ Clear All Outputs | ⏷ Variables ⏷ Outline ... Python 3.11.9

```

def fetch_data(url):
    auth = ('admin1', 'admin2025')
    response = requests.get(url, auth=auth)
    if response.status_code == 200:
        return response.json().get('d', {}).get('results', [])
    return []

```

Call The fetch\_data() function

```

# API URLs
inventory_url = "https://verona.cob.csuchico.edu:8045/odata/315/Inventory?$format=json"
sales_url = "https://verona.cob.csuchico.edu:8045/odata/315/Sales?$format=json"
market_url = "https://verona.cob.csuchico.edu:8045/odata/315/Market?$format=json"

# Fetching data
inventory_data = fetch_data(inventory_url)
sales_data = fetch_data(sales_url)
market_data = fetch_data(market_url)
print("Data Fetched Successfully")

```

## 5] To verify data upload:

- Log in to **Snowflake**.
- Navigate to **Data → Database → TEST → Public**.
- Select **Data Preview** to view the uploaded data.

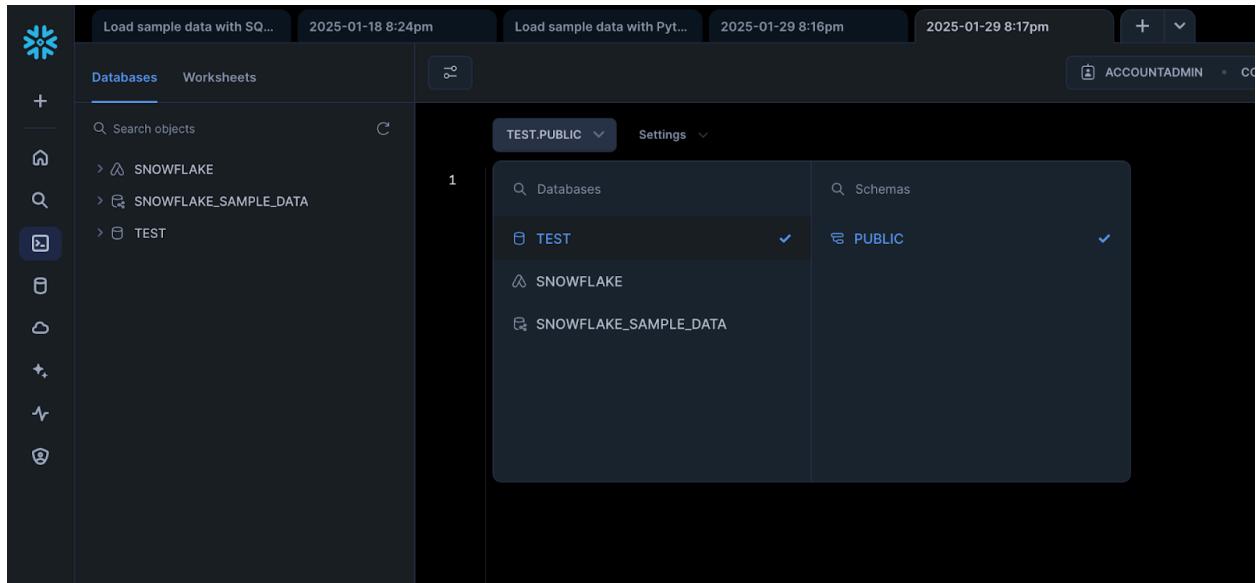
The screenshot shows the Snowflake web interface. On the left, the navigation sidebar includes 'Create', 'Home', 'Search', 'Projects', 'Data' (with 'Databases' selected), and 'Add Data'. The main content area shows the 'TEST / PUBLIC / InventoryTable' page. The table has 462 rows and was last updated 3 minutes ago. The columns are ID, ROW\_ID, PLANT, SIM\_ROUND, SIM\_STEP, and SIM\_DATE. The data preview table is as follows:

	ID	ROW_ID	PLANT	SIM_ROUND	SIM_STEP	SIM_DATE
1	.1~404	404	AA	1	19	01/19
2	.1~184	184	AA	1	9	01/09
3	.1~448	448	AA	2	1	02/01
4	.1~162	162	AA	1	9	01/09

# Data Visualization with Snowflake

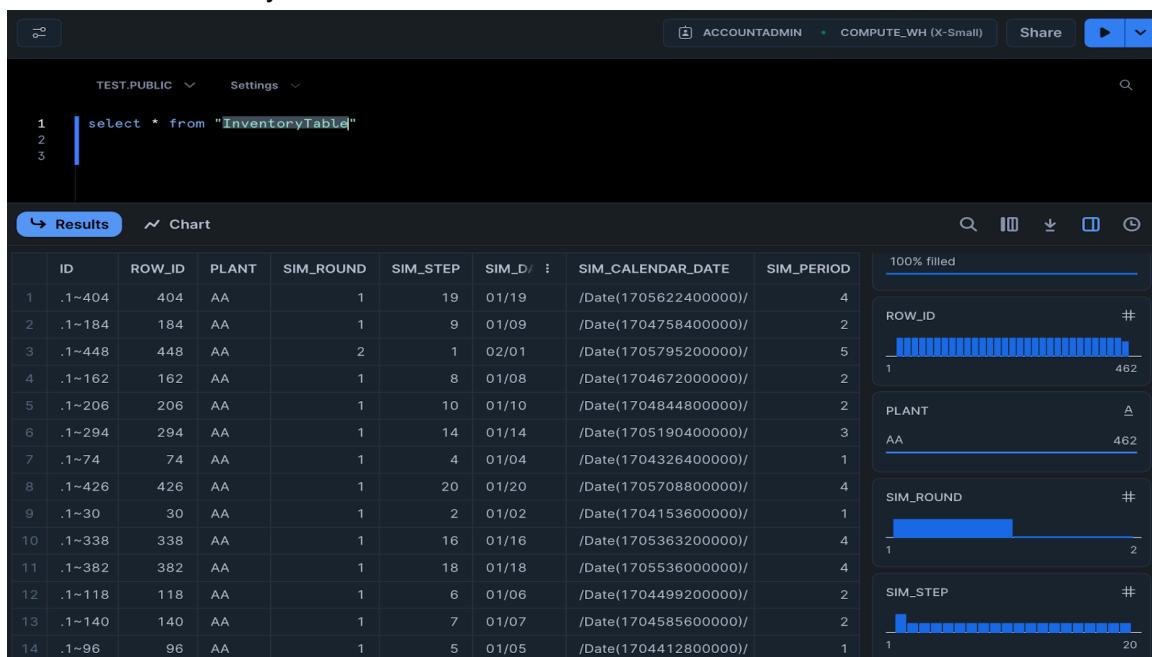
1] Navigate to **Projects** → **Worksheets** from the side panel. Click **Create SQL Worksheet** (or click the "+" icon at the top right).

2] Select your **database** and rename your **worksheet** from the tabs (optional).



The screenshot shows the Snowflake web interface. On the left is a dark sidebar with various icons for navigation. The main area has three tabs at the top: "Databases" (selected), "Worksheets", and "Shares". Below these are three cards: "Load sample data with SQ..." (2025-01-18 8:24pm), "Load sample data with Pyt..." (2025-01-29 8:16pm), and "2025-01-29 8:17pm". A modal window is open in the center, titled "TEST.PUBLIC". It shows a list of databases under "TEST": SNOWFLAKE, SNOWFLAKE\_SAMPLE\_DATA, and TEST. Under the selected database "TEST", there is a list of schemas: PUBLIC and SNOWFLAKE\_SAMPLE\_DATA.

3] Try running a simple query like “`select * from “InventoryTable”`” which would show all the data and will automatically create some visualizations based on the data



The screenshot shows a SQL worksheet in the Snowflake interface. The query entered is:

```
1 select * from "InventoryTable"
```

The results are displayed in a table and several embedded visualizations:

ID	ROW_ID	PLANT	SIM_ROUND	SIM_STEP	SIM_DATE	SIM_CALENDAR_DATE	SIM_PERIOD	
1 .1~404	404	AA		1	19	01/19	/Date(1705622400000)/	4
2 .1~184	184	AA		1	9	01/09	/Date(1704758400000)/	2
3 .1~448	448	AA		2	1	02/01	/Date(1705795200000)/	5
4 .1~162	162	AA		1	8	01/08	/Date(1704672000000)/	2
5 .1~206	206	AA		1	10	01/10	/Date(1704844800000)/	2
6 .1~294	294	AA		1	14	01/14	/Date(1705190400000)/	3
7 .1~74	74	AA		1	4	01/04	/Date(1704326400000)/	1
8 .1~426	426	AA		1	20	01/20	/Date(1705708800000)/	4
9 .1~30	30	AA		1	2	01/02	/Date(1704153600000)/	1
10 .1~338	338	AA		1	16	01/16	/Date(1705363200000)/	4
11 .1~382	382	AA		1	18	01/18	/Date(1705536000000)/	4
12 .1~118	118	AA		1	6	01/06	/Date(1704499200000)/	2
13 .1~140	140	AA		1	7	01/07	/Date(1704585600000)/	2
14 .1~96	96	AA		1	5	01/05	/Date(1704412800000)/	1

Visualizations include:

- A bar chart for "ROW\_ID" showing values from 1 to 462.
- A bar chart for "PLANT" showing values for AA (462).
- A bar chart for "SIM\_ROUND" showing values from 1 to 2.
- A bar chart for "SIM\_STEP" showing values from 1 to 20.

4] Click on individual columns to see column-specific visualizations.

A screenshot of a Snowflake worksheet interface. At the top, there is a code editor with the following SQL query:

```
1 select * from "InventoryTable"
2
3
```

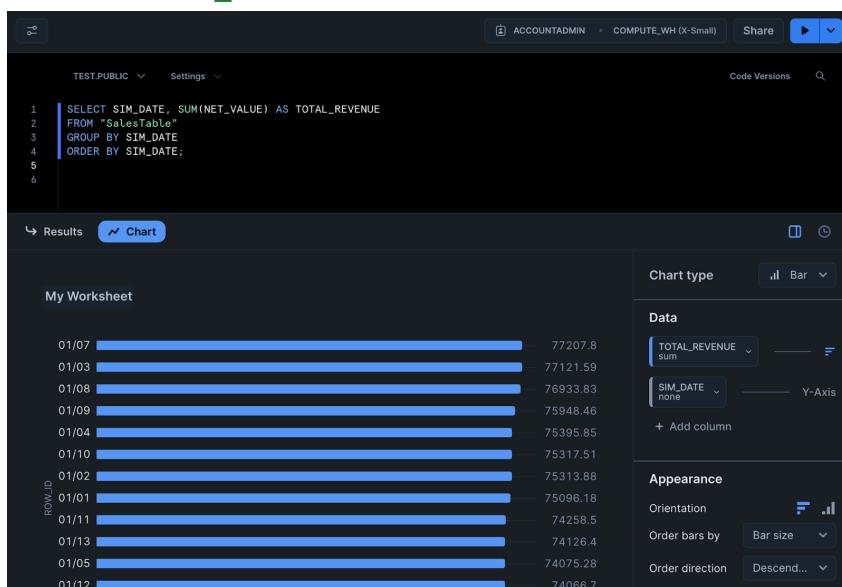
Below the code editor are two tabs: "Results" (selected) and "Chart". The "Results" tab displays a table with 11 rows of data. The columns are: ID, ROW\_ID, PLANT, SIM\_ROUND, SIM\_STEP, SIM\_DATE, SIM\_CALENDAR\_DATE, and SIM\_PERIOD. The "Chart" tab is active, showing a histogram for the "SIM\_STEP" column. The histogram has 20 bins, labeled "1 — 20" on the x-axis. The distribution is highly skewed, with most values falling between 1 and 10. Summary statistics on the right side of the chart area show: Sum = 4642 and Average = 10.0476190476190476190...

With these simple steps, you can create data visualizations effortlessly in Snowflake.

5] Let's do a simple data visualization

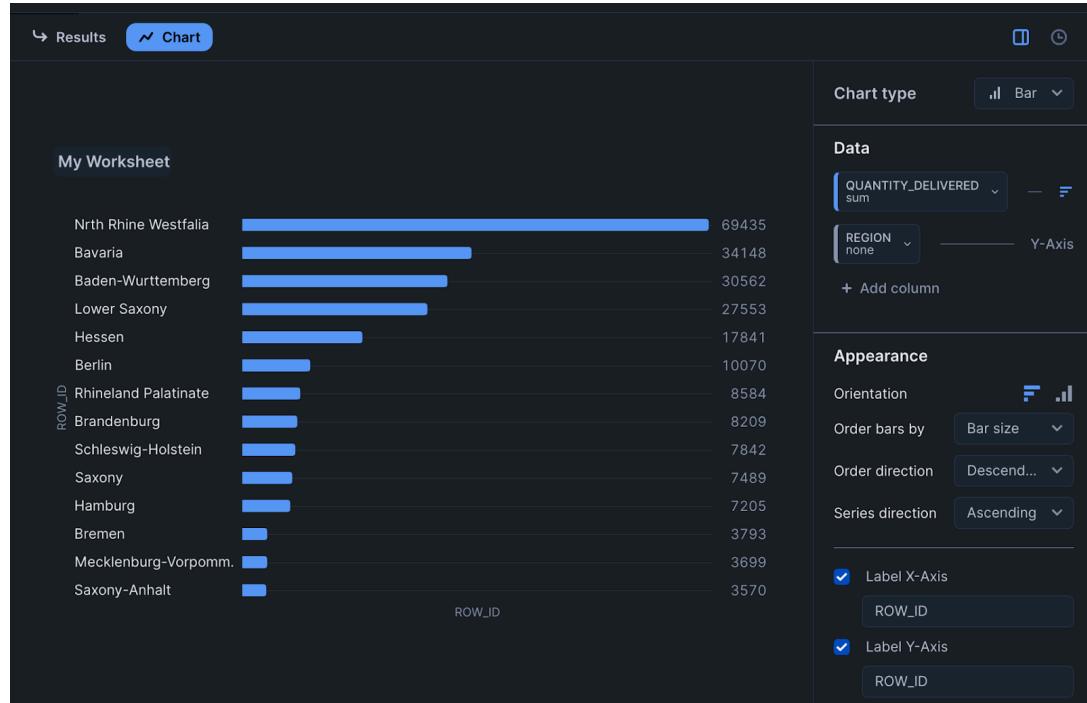
- a) **Sales Trend Over Time** - write the following query in the worksheet hit Run and click on Charts tab.

```
SELECT SIM_DATE, SUM(NET_VALUE) AS TOTAL_REVENUE
FROM "SalesTable"
GROUP BY SIM_DATE
ORDER BY SIM_DATE;
```



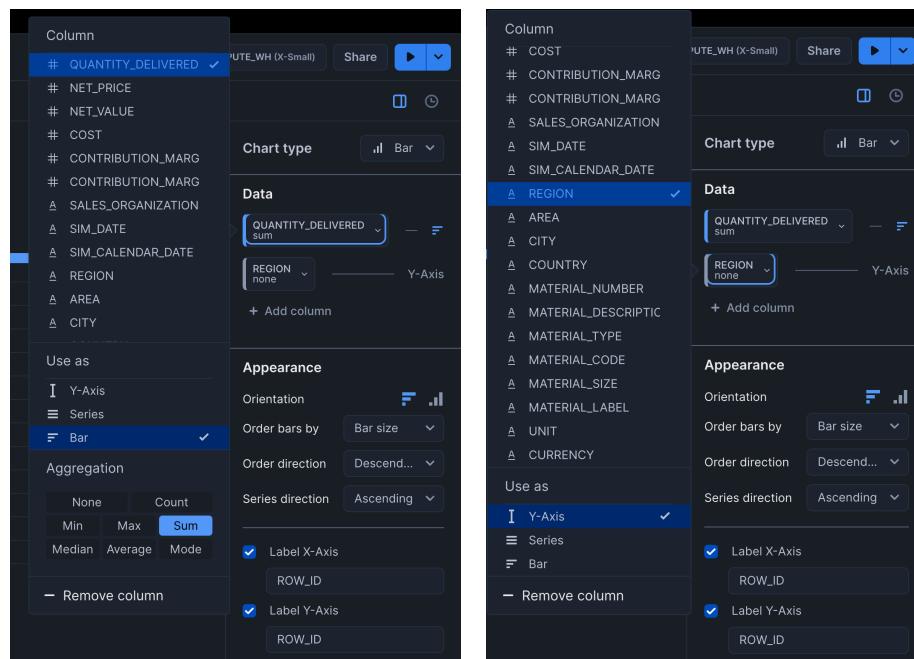
b) **Regional Sales Analysis** - This time we would do analysis without writing any special query except “`select * from "SalesTable"` to fetch all the sales records.

- i) Move over to Chart tabs, select chart type as “**Bar Type**”
- ii) Select X-axis as **QUANTITY\_DELIVERED** and Y-axis as **REGION** (if some columns are selected as default you click on data->col name->remove)



iii)

iv)



If you face any difficulties at any step, feel free to reach out.

Thank you & Happy Coding! 🎉

