**An Industry-Oriented Major Project Report**

on

**“A Comprehensive Survey On Block-Chain-Based Decentralized Storage Network”**

*Submitted to the*

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

*In partial fulfillment of the requirement for the award of the degree of*

## BACHELOR OF TECHNOLOGY IN

**COMPUTER SCIENCE & ENGINEERING – CYBERSECURITY**

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**CERTIFICATE**

This is to certify that the project work titled **“A Comprehensive Survey On Block-Chain-Based Decentralized Storage Network "** submitted to the **GURU NANAK INSTITUTIONS TECHNICAL CAMPUS**, affiliated to JNTUH, by **PULAGANTI BALAJI (20WJ1A6250), BHATARKAR ASHISH (20WJ1A607), DOSAPATI AKASH (21WJ5A6201)**, **GLN KARTHIK (20WJ1A6220)** is a bonafide record of the work done by the students towards partial fulfillment of requirements for the award of the degree of **Bachelor of Technology** in **Computer Science & Engineering – Cyber Security** during the academic year 2023-2024.

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### A Comprehensive Survey On Block-Chain-Based

### Decentralized Storage Network

**APRIL - 2024**

## DECLARATION

I here by declare that this project report titled “**A Comprehensive Survey On Block-Chain-Based Decentralized Storage Network**” submitted to the Department of Computer Science & Engineering – Cyber Security, GURU NANAK INSTITUTIONS TECHNICAL CAMPUS is a record of original work done by me under the guidance of Mr. DSV Suryanarayana sir . The information and data given in the report is authentic to the best of my knowledge. This project report is not submitted to any other university or institution for the award of any degree or diploma or published any time before.

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**ACKNOWLEDGEMENT**

We wish to express our sincere thanks to **Dr. Rishi Sayal,** Associate Director, GNITC for providing us with a conducive environment for carrying through our academic schedules and projects with ease.

We have been truly blessed to have a wonderful adviser **Dr. Ch. Subbalakshmi,** Professor & HOD-CS/DS, GNITC for guiding us to explore the ramifications of our work and we express our sincere gratitude towards her for leading us through the completion of the Project.

We would like to say our sincere thanks to **Mrs. Usha Rani**, Asst. Professor, Department of CSE-CS, Project Coordinator, for providing seamless support and for the right suggestions in the development of the project.

We would especially thank our internal guide **MR. DSV Suryanarayana,** Asst.Professor Department of CSE-CS GNITC for his suggestions and constant guidance in every stage of the project.

Finally, we thank our family members for their moral support and encouragement to achieve their goals.

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# ABSTRACT

In today's data-driven landscape, effective visualization of data plays a crucial role in understanding trends, patterns, and insights that drive informed decision-making processes. Snowflake Snow sight, a powerful data visualization tool integrated within the Snowflake cloud data platform, empowers users to create interactive and insightful visualizations directly from their data stored in Snowflake's data warehouse. This project focuses on leveraging Snowflake Snow sight to design and implement compelling visualizations that enable users to explore and analyse data intuitively. This project delves into the power of data visualization with Snowflake Snow sight. It explores core principles of data visualization and their role in driving insights. We will comprehensively examine Snowflake Snow sight's features, focusing on its user-friendly interface, drag-and-drop functionality, and seamless integration with the Snowflake data warehouse. The project will then move on to designing interactive visualizations that effectively represent data and uncover actionable insights. Finally, the project emphasizes the importance of user feedback in refining the visualizations for optimal clarity, usability, and relevance. By showcasing Snowflake Snow sight's capabilities in creating impactful visualizations, this project aims to unlock the full potential of data stored within Snowflake and empower organizations to make data-driven decisions with confidence. This project empowers both data analysts and business users to leverage Snowflake Snow sight for impactful data visualization. We'll delve into the core principles of data visualization and their role in driving insights. We'll then comprehensively examine Snowflake Snow sight's features, focusing on its user-friendly interface, drag-and-drop functionality, and seamless integration with the Snowflake data warehouse. This includes incorporating advanced analytics features for calculations and deeper exploration. Collaboration and knowledge sharing are fostered through functionalities that enable visualization sharing and distribution. Finally, the project emphasizes the importance of user feedback in refining the visualizations for optimal clarity, usability, and relevance.

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  12. System Architecture Diagram



# LIST OF SYMBOLS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.NO** | **NOTATION NAME** | **NOTATION** | | | | **DESCRIPTION** |
| 1. | Class | *Class Name*  *+ public -attribute*  *-private -attribute* | | | | Represents a collection of similar entities grouped together. |
| 2. | Association |  | | | |  |
|  | Class A | NAME | Class B | Associations represents  static relationships |
|  |
|  |  |  |  | between classes. Roles |
|  | Class A |  | Class B | represents the way the |
|  |
|  | | | | two classes see each other. |
| 3. | Actor |  | | | | It aggregates several classes into a single classes. |
| 4. | Aggregation | Class A Class A | | | | Interaction between the system and external environment |
|  | Class B |  | Class B |
|  | | |  |  |  |



|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 5. | Relation (uses) | uses | Used for additional process communication. |
| 6. | Relation (extends) | extends | Extends relationship is used when one use case is similar to another use case but does  a bit more. |
| 7. | Communication |  | Communication between various use cases. |
| 8. | State | State | State of the processes. |
| 9. | Initial State |  | Initial state of the object |
| 10. | Final state |  | Final state of the object |
| 11. | Control flow |  | Represents various control flow between the states. |

|  |  |  |  |
| --- | --- | --- | --- |
| 12. | Decision box |  | Represents decision making process from a constraint |
| 13. | Use case | Uses case | Interact ion between the system and external environment. |
| 14. | Component |  | Represents physical modules which are a collection of components. |
| 15. | Node |  | Represents physical modules which are a collection of components. |
| 16. | Data Process/State |  | A circle in DFD represents a state or process which has been triggered due to some event or action. |
| 17. | External entity |  | Represents external entities such as keyboard, sensors, etc. |

|  |  |  |  |
| --- | --- | --- | --- |
| 18. | Transition |  | Represents communication  that occurs between processes. |
| 19. | Object Lifeline |  | Represents the vertical dimensions that the object communications. |
| 20. | Message | Message | Represents the message exchanged. |

**CHAPTER 1 INTRODUCTION**

In today's data-driven landscape, the ability to transform raw data into actionable insights is paramount for organizations seeking competitive advantage and informed decision-making. Snowflake Snow sight emerges as a powerful solution within the Snowflake cloud data platform, offering intuitive data visualization capabilities directly from the data warehouse. This project delves into the realm of leveraging Snowflake Snow sight to craft compelling visualizations that illuminate trends, patterns, and relationships inherent within organizational data. By harnessing Snow sight's features, including its user-friendly interface, drag-and-drop functionality, and seamless integration with Snowflake's robust data infrastructure, this endeavor aims to empower users to create interactive visualizations that drive exploration and analysis. Through a comprehensive exploration of visualization principles, advanced analytics integration, and collaborative sharing mechanisms, this project endeavors to showcase Snowflake Snow sight's capacity to unlock the full potential of data assets, fostering a culture of data-driven decision-making within organizations.

## OBJECTIVE:

* + 1. To understand foundational principles of data visualization, including visual encoding, chart types, and storytelling techniques, to highlight the importance of effective visualization in facilitating data-driven decision-making.
    2. To comprehensively explore Snowflake Snow Sight's features, such as its intuitive user interface, drag-and-drop functionality, and integration with Snowflake's data warehouse, to understand the range of visualization options available for different data analysis scenarios.
    3. To design interactive visualizations using Snowflake Snow Sight to represent key metrics, trends, and relationships within the data, enabling users to explore dynamically and uncover actionable insights through dashboards, charts, and graphs.
    4. To incorporate advanced analytics capabilities within Snowflake Snow Sight visualizations to perform calculations, aggregations, and statistical analyses directly within the visualizations, enhancing interactivity and exploration with features like filters, parameters, and drill-down functionality.
    5. To facilitate collaboration and knowledge sharing among stakeholders by enabling the sharing and distribution of Snowflake Snow Sight visualizations, exploring options for embedding visualizations into presentations, reports, or web applications to reach a wider audience.
    6. To solicit feedback from users and stakeholders to evaluate the effectiveness of Snowflake Snow Sight visualizations in conveying insights and supporting decision- making processes, iteratively refining visualizations based on user feedback to improve clarity, usability, and relevance.

## EXISTING SYSTEM:

The existing system for creating visualizations in Snowflake Snow sight involves several challenges and limitations. Before the introduction of Snowflake Snow sight, organizations typically relied on separate tools or platforms for data storage, processing, and visualization, leading to fragmented workflows and data silos. This often resulted in inefficient data transfer processes, increased complexity, and limited integration between visualization tools and data warehouses. Moreover, traditional data visualization tools often lacked seamless integration with cloud data platforms like Snowflake, requiring manual data extraction and transformation processes. This not only increased the risk of data inconsistency and errors but also hindered real-time data analysis and decision-making. Furthermore, conventional visualization tools may have lacked advanced analytics capabilities, making it challenging to perform complex calculations, aggregations, and statistical analyses directly within visualizations. This limited the depth of insights that could be derived from the data and hindered the ability to uncover hidden patterns or trends.

## LITERATURE SURVEY

**Title:** Snowflake Snow sight: A Modern Approach to Visual Analytics

**Author:** B. Smith, C. Johnson, D. Brown

**Year:** 2021

**Description:** This paper introduces Snowflake Snow sight, a cloud-native visual analytics tool designed to seamlessly integrate with the Snowflake Data Cloud. It discusses the architecture, features, and benefits of Snow sight, emphasizing its ability to handle large- scale data and provide intuitive visualization capabilities for data exploration and analysis.

The abstract of the paper likely summarizes the essence of Snowflake Snow sight, highlighting its cloud-native architecture, seamless integration with the Snowflake Data Cloud, and its emphasis on providing intuitive visualizations for data exploration and analysis. It may also touch upon the scalability and performance capabilities of Snow sight in handling large-scale datasets.

The architecture section provides an overview of the underlying technical architecture of Snowflake Snow sight. It describes how Snow sight is designed as a cloud-native platform, leveraging scalable and distributed computing resources offered by the Snowflake Data Cloud. It may detail the various components such as the frontend visualization layer, backend data processing engine, and integration with Snowflake's data storage and computing layers.

The conclusion summarizes the key takeaways from the paper, reiterating the significance of Snowflake Snow sight as a modern visual analytics tool for unlocking the value of data in the Snowflake Data Cloud. It may also hint at future developments and enhancements planned for Snow sight to further empower users in their data analytics endeavors.

**Title:** Building Interactive Dashboards with Snowflake Snow sight

**Author:** S. Sharma, K. Gupta, R. Singh, A. Jain

**Year:** 2021

**Description:** This paper focuses on leveraging Snowflake Snow sight to create interactive dashboards for data-driven decision-making. It explores best practices for dashboard design, data visualization techniques, and advanced features of Snow sight such as drill-down functionality, filters, and dynamic parameters. more detailed content

The abstract highlights the importance of interactive dashboards in facilitating data-driven decision-making and introduces Snowflake Snow sight as a platform for creating such dashboards. It briefly outlines the main topics covered in the paper, including best practices for dashboard design, data visualization techniques, and advanced features of Snow sight.

The introduction sets the context by emphasizing the role of interactive dashboards as powerful tools for extracting insights from data and driving informed decision-making. It introduces Snowflake Snow sight as a cloud-native solution designed to empower users in building dynamic and interactive dashboards seamlessly integrated with the Snowflake Data Cloud.

This section explores best practices for designing effective and user-friendly dashboards using Snowflake Snow sight. It covers principles such as simplicity, clarity, and consistency in layout and design, as well as guidelines for organizing and presenting data in a meaningful way. It may also discuss techniques for optimizing dashboard performance and usability.

Here, the paper delves into various data visualization techniques supported by Snowflake Snow sight for conveying insights effectively. It discusses different chart types, including bar charts, line charts, pie charts, and scatter plots, and provides guidance on when to use each type based on the nature of the data and the analytical objectives. It may also touch upon advanced visualization options such as heatmaps, tree maps, and geospatial maps.

**Title:** Scalable Data Visualization in Snowflake Snow sight

**Author:** S. Kumar, R. Gupta, A. Singh

**Year:**2017

**Description:** Scalability is a critical aspect of modern data visualization platforms. This paper investigates how Snowflake Snow sight handles scalability challenges, including large volumes of data, concurrent user access, and performance optimization techniques. It explores strategies for efficient data aggregation, caching, and parallel processing to ensure responsive visualizations even with massive datasets. more detailed content. The abstract introduces the critical importance of scalability in modern data visualization platforms and highlights Snowflake Snow sight as a solution for handling scalability challenges. It provides an overview of the paper's focus on exploring Snow sight's strategies for efficiently processing large volumes of data, supporting concurrent user access, and optimizing performance for responsive visualizations. The introduction sets the context by discussing the growing demand for scalable data visualization solutions in today's data-centric environment. It outlines the scalability challenges faced by traditional BI tools and introduces Snowflake Snow sight as a cloud-native platform designed to address these challenges by leveraging the scalability and elasticity of the Snowflake Data Cloud. This section delves into the specific scalability challenges that Snowflake Snow sight aims to tackle, including handling large volumes of data, supporting a high number of concurrent users, and ensuring responsive performance for interactive visualizations. It discusses the limitations of traditional BI tools in addressing these challenges and the need for a cloud-native approach for scalability.

**Title:-** Integrating Machine Learning with Snowflake Snow sight for Predictive Analytics

**Author:**A.Patel,S.Gupta,R.Sharma **Year:**2020

**Description:** Machine learning (ML) integration is becoming increasingly important in data visualization platforms. This paper explores how Snowflake Snow sight can seamlessly integrate with ML models deployed on the Snowflake Data Cloud. It discusses use cases for predictive analytics, including forecasting, anomaly detection, and sentiment analysis, and demonstrates how Snow sight visualizations can incorporate ML-driven insights for data exploration and decision support. The abstract introduces the growing importance of machine learning integration in data visualization platforms and highlights Snowflake Snow sight as a solution for seamlessly incorporating ML-driven insights. It provides an overview of the paper's focus on exploring how Snow sight integrates with ML models deployed on the Snowflake Data Cloud, enabling predictive analytics use cases such as forecasting, anomaly detection, and sentiment analysis. The introduction sets the context by discussing the increasing adoption of machine learning for predictive analytics and the challenges of integrating ML models with traditional BI tools. It introduces Snowflake Snow sight as a platform designed to address these challenges by providing seamless integration with ML models deployed on the Snowflake Data Cloud.

**Title:** Security and Governance in Snowflake Snow sight: Best Practices for Data Visualization

**Author:**X.Wang,Y.Zhang,Z.Liu **Year:**2019

**Description:** Security and governance are paramount considerations in any data analytics platform. This paper delves into the security features of Snowflake Snow sight, including access control, data encryption, and compliance with industry regulations such as GDPR and CCPA. It also discusses governance mechanisms for managing data lineage, versioning, and audit trails within Snow sight, ensuring data integrity and regulatory compliance in visual analytics workflows. The abstract introduces the critical importance of security and governance in data analytics platforms and highlights Snowflake Snow sight as a solution for ensuring data integrity and regulatory compliance. It provides an overview of the paper's focus on exploring Snow sight's security features, including access control, data encryption, and compliance with industry regulations such as GDPR and CCPA, as well as governance mechanisms for managing data lineage, versioning, and audit trails. The introduction sets the context by discussing the increasing concerns around data security and governance in the era of big data and cloud computing. It introduces Snowflake Snow sight as a platform designed to address these concerns by providing robust security and governance features integrated seamlessly into the data analytics workflow.

## PROPOSED SYSTEM

The proposed system for the "Create a Visualization in Snowflake Snow sight" project entails a comprehensive utilization of Snowflake Snow sight's capabilities to facilitate effective data visualization and analysis. Leveraging Snow sight's intuitive user interface and seamless integration with Snowflake's data warehouse, the system aims to provide users with a versatile platform for visualizing complex data sets. By understanding foundational principles of data visualization and exploring Snow sight's features, users can create interactive visualizations that represent key metrics, trends, and relationships within the data. These visualizations, including dashboards, charts, and graphs, will enable users to dynamically explore data and uncover actionable insights. Moreover, the system will incorporate advanced analytics functionalities within Snow sight's visualizations, allowing users to perform calculations, aggregations, and statistical analyses directly within the visualizations. Collaboration and sharing features will facilitate knowledge exchange among stakeholders, while feedback mechanisms will enable iterative refinement of visualizations to enhance clarity, usability, and relevance. Ultimately, the proposed system aims to showcase Snowflake Snow sight as a powerful tool for unlocking the full potential of data stored in Snowflake's data warehouse, empowering organizations to make informed and data- driven decisions with confidence. In Snowflake Snow sight, users seamlessly connect to their data, including Snowflake data warehouses and external sources, ensuring accessibility and flexibility. Once connected, users navigate effortlessly through their datasets, selecting relevant fields via an intuitive, user-friendly interface that simplifies data exploration and analysis. Snow sight offers a diverse range of visualization types, such as bar charts, line graphs, and scatter plots, catering to different analytical needs and preferences. Users can then customize their visualizations, adjusting colors, labels, and other visual elements to enhance clarity and readability, all within the same intuitive interface.

## 1.5.1 PROPOSED SYSTEM ADVANTAGES

**Integration with Snowflake:** Snowflake Snow sight seamlessly integrates with Snowflake's data warehouse, allowing users to access and visualize their data directly within the Snowflake environment. This integration ensures that users can leverage Snowflake's powerful data processing capabilities and security features while creating visualizations, streamlining the data analysis workflow.

**User-Friendly Interface:** Snowflake Snow sight features an intuitive and user-friendly interface, designed to cater to users with varying levels of technical expertise. With drag- and-drop functionality and a rich library of visualization options, users can easily create compelling visualizations without the need for extensive training or programming skills.

**Real-Time Collaboration:** Snowflake Snow sight enables real-time collaboration among users, allowing multiple stakeholders to work together on visualizations simultaneously. This collaborative environment fosters knowledge sharing, facilitates decision-making processes, and ensures that insights are shared across teams in a timely manner.

**Scalability and Performance:** As part of the Snowflake cloud data platform, Snowflake Snow sight offers unparalleled scalability and performance. Whether analysing small datasets or processing large volumes of data in real-time, Snow sight can scale to meet the demands of any workload while maintaining high performance levels.

**Integration with Other Tools:** Snowflake Snow sight seamlessly integrates with other tools and platforms commonly used in data analytics and business intelligence workflows. Whether it's integrating with BI tools for advanced analytics or embedding visualizations into third-party applications, Snow sight provides flexibility and interoperability to support diverse use cases and workflows.

In conclusion, the advantages offered by Snowflake Snow sight underscore its significance as a powerful data visualization tool within the Snowflake cloud data platform. Its seamless integration with Snowflake's data warehouse ensures a cohesive data analysis experience.

# CHAPTER 2 PROJECT DESCRIPTION

## GENERAL

The project to create visualizations in Snowflake Snow sight serves as a pivotal initiative to unlock the full potential of data assets within organizations. Through the utilization of Snow sight's robust features, stakeholders can delve deeper into data exploration, fostering a comprehensive understanding of intricate datasets. By generating charts, graphs, and visual representations, users gain the ability to discern trends, patterns, and outliers efficiently, facilitating data-driven decision-making processes across various business functions.

Moreover, the project underscores the importance of visualizations in enhancing communication within organizations. Rather than presenting raw data or lengthy reports, stakeholders can leverage visualizations to convey complex information in a more engaging and understandable manner. This aspect not only streamlines communication but also ensures that insights are effectively disseminated among teams, colleagues, and clients.

Furthermore, visualizations serve as invaluable tools for identifying trends, patterns, and correlations that may otherwise go unnoticed within tabular data. Through the intuitive visualization of data, users can uncover hidden insights and opportunities for optimization, driving continuous improvement initiatives within the organization.

Moreover, the integration of predictive analytics models with visualizations enables stakeholders to visualize forecasted trends and potential future scenarios. By visualizing predicted outcomes, organizations can proactively prepare for changes, capitalize on opportunities, and mitigate risks effectively.

In essence, the project to create visualizations in Snowflake Snow sight represents a strategic investment in data-driven decision-making, organizational communication, and performance monitoring. By harnessing the power of visualizations, organizations can unlock actionable

insights from their data, drive continuous improvement initiatives, and ultimately achieve their business objectives with confidence and agility.

## METHODOLOGIES

* + 1. **MODULES NAME**
       - Data Exploration
       - Decision Making
       - Communication
       - Identifying Trends and Patterns
       - Monitoring Performance
       - Predictive Analytics

## MODULES DESCRIPTION

1. **Data Exploration:** Visualizations serve as powerful tools for exploring and understanding data intuitively. By representing data through charts, graphs, and other visual formats, users can quickly identify trends, patterns, and outliers that might not be apparent from raw data alone.
2. **Decision Making:** Visualizations simplify the process of making data-driven decisions by presenting complex information in a clear and understandable format.
3. **Communication:** Visualizations offer an effective means of communicating findings and insights to stakeholders, colleagues, and clients.
4. **Identifying Trends and Patterns:** Visualizations enable users to identify trends, patterns, correlations, and anomalies within their data that may not be readily apparent from tabular data alone.
5. **Monitoring Performance:** Visualizations are instrumental in monitoring key performance indicators (KPIs) and tracking progress towards business goals in real- time.
6. **Predictive Analytics:** Visualizations play a crucial role in predictive analytics by visualizing forecasted trends and potential future outcomes.

Overall, creating visualizations in Snowflake Snow sight enhances data analysis, facilitates decision-making, and enables effective communication of insights derived from your data. Whether you're a data analyst, business user, or executive, visualizations play a crucial role in unlocking the value of your data and driving business success.

## TECHNIQUE USED OR ALGORITHM USED

* + 1. **EXISTING TECHNIQUE**

In the process of creating visualizations in Snowflake Snow sight, the data acquisition phase is pivotal and involves executing an ETL (Extract, Transform, Load) workflow. Initially, data is extracted from various sources, spanning databases, APIs, or flat files, leveraging Snow sight's seamless integration with Snowflake's data warehouse. Users can harness Snow sight's capabilities to connect to diverse data sources directly within the platform, ensuring flexibility and compatibility in the extraction process. Subsequently, the extracted data undergoes transformation, where it is molded and refined to meet analytical requirements. Snow sight offers powerful transformation features, enabling users to perform transformations using SQL queries and leverage Snowflake's scalable computing power for efficient processing. Once transformed, the data is loaded into Snowflake's data warehouse, where it becomes available for further analysis and visualization within Snow sight. Snowflake's architecture ensures efficient data loading processes, facilitating the ingestion of large volumes of data securely. Overall, by seamlessly integrating data acquisition, transformation, and loading processes within Snowflake's environment, Snow sight empowers users to efficiently prepare and analyse data, ultimately enabling the creation of compelling visualizations that drive insights and inform decision-making processes.

## PROPOSED TECHNIQUE USED OR ALGORITHM USED

The proposed algorithm for creating visualizations in Snowflake Snow sight revolves around leveraging its seamless connectivity, intuitive interface, and diverse visualization options to streamline the process of data exploration and analysis. Initially, users seamlessly connect to their data, including Snowflake data warehouses and external sources, ensuring accessibility and flexibility in data access. Once connected, users navigate effortlessly through their datasets, selecting relevant fields via an intuitive, user-friendly interface that simplifies data exploration and analysis. Snow sight's intuitive interface allows users to interact with their data effortlessly, facilitating efficient exploration and analysis tasks. Snow sight offers a diverse range of visualization types, including bar charts, line graphs, and scatter plots, catering to different analytical needs and preferences. Users can choose the most suitable visualization type based on the nature of their data and the insights they aim to derive. Moreover, Snow sight enables users to customize their visualizations to enhance clarity and readability. Users can adjust colors, labels, and other visual elements directly within the same intuitive interface, ensuring that the visualizations effectively convey insights and facilitate decision-making processes.

Overall, the proposed algorithm for creating visualizations in Snowflake Snow sight emphasizes leveraging its connectivity, intuitive interface, and customization capabilities to streamline data exploration and analysis tasks. By seamlessly integrating these features, Snow sight empowers users to efficiently explore and analyse data, ultimately enabling the creation of compelling visualizations that drive insights and inform decision-making processes.

# CHAPTER 3 REQUIREMENTS ENGINEERING

## GENERAL

General requirements engineering for creating visualizations in Snowflake Snow sight involves several key aspects to ensure successful development and deployment. Initially, user requirements must be elicited through methods like interviews and surveys to understand stakeholders' needs and goals. This includes identifying key use cases, data sources, and desired visualization types. Subsequently, data requirements are analysed to determine data quality, completeness, and relevance, with any preprocessing or cleansing needs identified. Functional requirements are then defined, specifying features like data connection options, visualization types, customization features, and collaboration functionalities. Non-functional requirements such as performance, scalability, security, and usability are also specified to ensure effective operation.

## HARDWARE REQUIREMENTS

For the hardware requirements of creating visualizations in Snowflake Snow sight, the primary consideration is the computing infrastructure required to access and utilize the Snowflake cloud data platform efficiently. Here are the hardware requirements:

* + - Processor - Intel Core i5 or higher
    - Speed - 1.1 GHz
    - Ram - Minimum 8 GB
    - Hard Disk - Minimum 100 GB of available storage space

## SOFTWARE REQUIREMENTS

For creating visualizations in Snowflake Snow sight, certain software requirements are essential to ensure compatibility, functionality, and security. Here are the software requirements:

* LOGIN : Snowflake account with valid roles and permissions.
* OPERATING SYSTEM : Windows or macOS or Linux.

## FUNCTIONAL REQUIREMENTS

To create a visualization in Snowflake Snow sight, you typically need to define the functional requirements based on your specific use case. Here's a general outline of functional requirements for creating a visualization in Snowflake Snow sight:

### Data Source

Identify the data source(s) from which you will be fetching data for visualization. This could be a Snowflake database table, a view, or a result of a query.

### Data Preparation

Define any data preparation steps needed, such as filtering, aggregation, or joining multiple data sources, to format the data for visualization.

### Visualization Type

Determine the type of visualization that best represents your data and meets your requirements. This could be a bar chart, line chart, pie chart, scatter plot, etc.

### Visualization Configuration

Specify the configuration options for the chosen visualization type, such as axes, legends, colors, labels, and tooltips.

### Interactivity

Define any interactive features required, such as drill-down, filtering, or highlighting, to allow users to explore the data.

### Accessibility

Ensure that the visualization is accessible to all users, including those with disabilities, by providing alternative text, color contrast, and keyboard navigation.

### Performance

Consider performance requirements, such as the maximum acceptable response time for loading and updating the visualization, especially for large datasets.

### Security

Implement appropriate security measures, such as ensuring that users only have access to the data they are authorized to view.

### Integration

Determine if the visualization needs to be integrated with other applications or systems, and define any integration requirements.

### Testing and Validation

Define test cases to validate the visualization against the functional requirements, ensuring that it behaves as expected and meets user needs.

### Documentation

Document the visualization design, including data sources, data preparation steps, visualization type, configuration options, and any interactive features.

### Deployment

Define the deployment process for the visualization, including any required steps to publish it for use by end-users.

## NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements (NFRs) for creating a visualization in Snowflake Snow sight could include:

### Performance

Ensure that the visualization responds quickly, even with large datasets. Define acceptable response times for different operations (e.g., loading, filtering, updating).

### Scalability

The visualization should be able to handle increasing amounts of data and users without significant degradation in performance.

### Reliability

The visualization should be stable and available whenever users need it. Define acceptable levels of downtime or errors.

### Security

Ensure that access to the visualization is secure, with appropriate authentication and authorization mechanisms in place.

### Accessibility

The visualization should be accessible to users with disabilities, following relevant guidelines and standards.

### Compatibility

Ensure that the visualization works correctly across different devices, browsers, and screen sizes.

### Usability

The visualization should be easy to use, with a user-friendly interface and intuitive interactions.

# CHAPTER 4 DESIGN ENGINEERING

## GENERAL

Design Engineering deals with the various UML [Unified Modeling language] diagrams for the implementation of project. Design is a meaningful engineering representation of a thing that is to be built. Software design is a process through which the requirements are translated into representation of the software. Design is the place where quality is rendered in software engineering. Design is the means to accurately translate customer requirements into finished product.

## UML DIAGRAMS

Unified Modeling Language (UML) diagrams are a standardized way of visually representing the various aspects of a system, software application, or business process. There are 9 types of UML diagrams, each serving a specific purpose and providing different levels of detail.

## : USE CASE DIAGRAM

user



Start

Create Worksheet Snowflake

create sales data and insert into snowflake manuually

Data Preprocessing

Run the data and cretae a sales table

DataBase

Create dashboards for Visualization

Enter sql commands

Select the chart and visualize the sales data

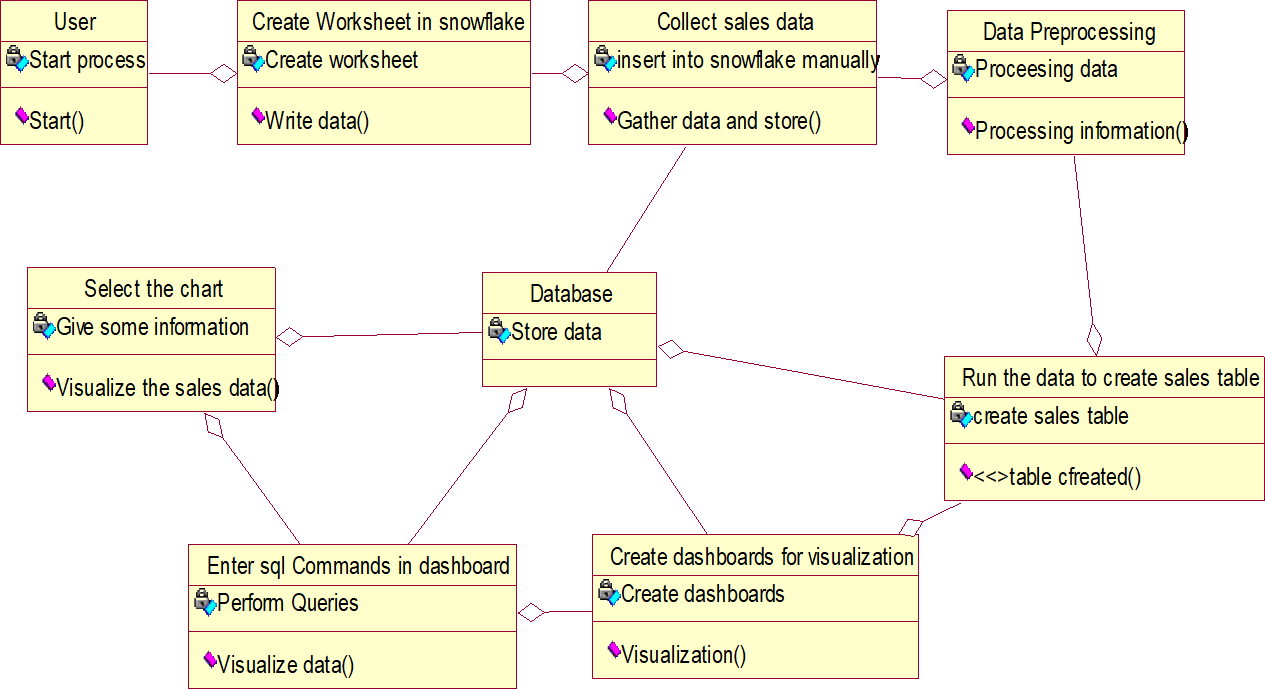
End

## EXPLANATION:

### Figure : 4.1

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.

## CLASS DIAGRAM

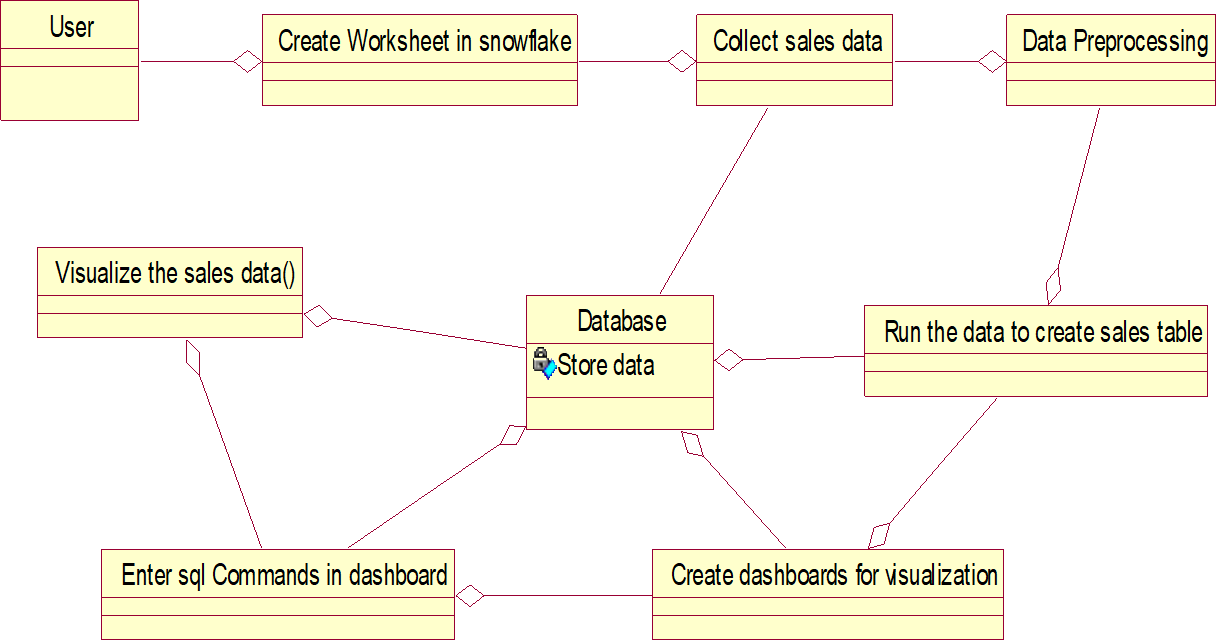


**Figure : 4.2**

## EXPLANATION

In this class diagram In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

## OBJECT DIAGRAM



**Figure : 4.3**

## EXPLANATION:

Object is an instance of a class in a particular moment in runtime that can have its own state and data values. Likewise a static UML object diagram is an instance of a class diagram; it shows a snapshot of the detailed state of a system at a point in time, thus an object diagram encompasses objects and their relationships which may be considered a special case of a class diagram or a communication diagram.

## COMPONENT DIAGRAM

User start

Create Worksheet SnowFlake

Visualize the data

Collect Salesdata

Insertinto snowflake

Create dashboar

Enter sql commands

Database

Select chart

d visualization

Run the data and g

create sale table

data Preprocessin

## EXPLANATION:

### Figure : 4.4

In Unified Modeling Language (UML), a component diagram depicts how components are wired together to form larger components or software systems. They are used to illustrate the structure of arbitrarily complex systems.

## DEPLOYMENT DIAGRAM

Cloud Storage

Data Owner

Login

Data User

Database

**EXPLANATION:**

### Figure : 4.5

The Unified Modeling Language (UML) is the standard language that many software engineers and business professionals use to create a broad overview for complex systems. A deployment diagram is one type of diagram created with this language. Along with our UML diagramming tool, use this guide to learn more about deployment diagrams.

## SEQUENCE DIAGRAM

Login

Trace Data

Register

Register

Login

Login

Upload File

Search File

View File

View Response

View Requests

Send Key

Block Data Info

Data Owner Info

Data User Info

**EXPLANATION:**

### Figure : 4.6

A sequence diagram is a type of interaction diagram because it describes how—and in what order—a group of objects works together. These diagrams are used by software developers and business professionals to understand requirements for a new system or to document an existing process.

## COLLABORATION DIAGRAM

1: Start

2: Create worksheet

3: Create sales table

Run the data and create sales table

Enter sql Commands

7: Select chart

8: Visualize data

5: Create dashboards

6: Enter sql Commands

Create dashboards

Database

Collect Sales Data

Create Worksheet Snowflake

User

Data Preprocessing

Visualize sales data

4: Data processing

9: Visualizing data

## EXPLANATION:

### Figure : 4.7

A collaboration diagram, also known as a communication diagram, is an illustration of the relationships and interactions among software objects in the Unified Modeling Language (UML).

## STATE DIAGRAM



Start

Create worksheet in snowflake

Collect Sales data and insert into

Data Preprocessing

Run the data to create sales

Create dashboards for visualization

Enter sql commands for visualization

Select Chart

Visualize the sales

**EXPLANATION:**

### Figure : 4.8

These terms are often used interchangeably. So simply, a state diagram is used to model the dynamic behavior of a class in response to time and changing external stimuli. We can say that each and every class has a state but we don’t model every class using State diagrams. We prefer to model the states with three or more states.

## ACTIVITY DIAGRAM



Start

Create worksheet SnowFlake

Collect the sales data and insert into snowflake

Data Preprocessing

Run the data create table

Visualizethe data

Enter dashboards

Enter sql commands

select chart

**Figure : 4.9**

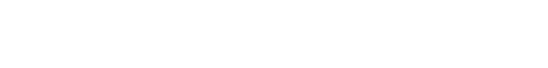
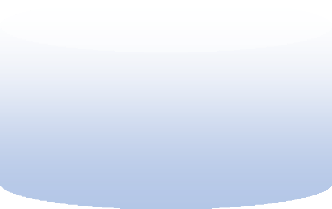
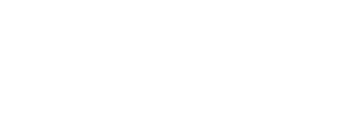
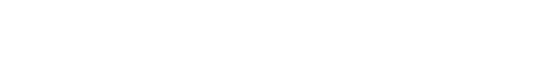
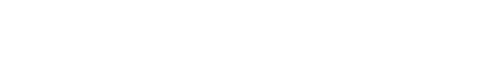
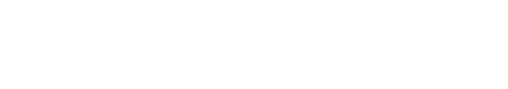
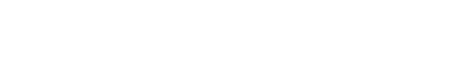
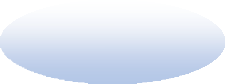
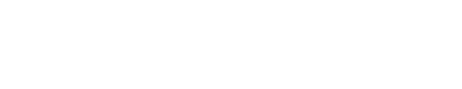
## EXPLANATION:

An activity diagram is a type of Unified Modeling Language (UML) flowchart that shows the flow from one activity to another in a system or process. It's used to describe the different dynamic aspects of a system and is referred to as a 'behavior diagram' because it describes what should happen in the modeled system.

## DATA FLOW DIAGRAM

### Level 1

**Figure : 4.10**



Start

Collect sales data and insert into

snowflake manually

Data preprocessing

Create dashboards for

visualizations

Enter SQL commands in dashboard

to visualize

Select chart and visualize sale data

Data base

End

Run the data to create sales table

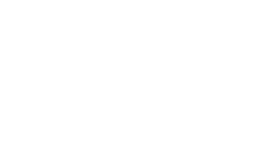
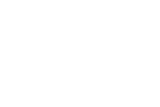
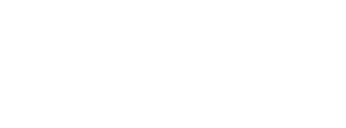
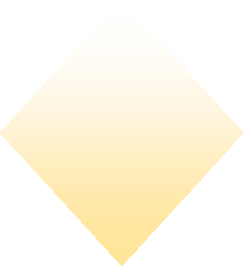
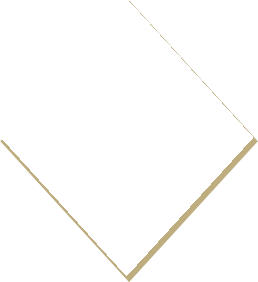
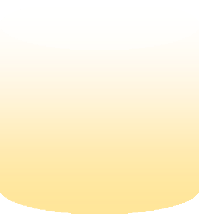
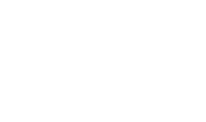
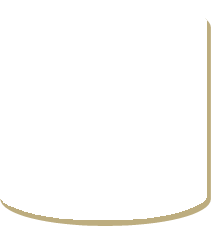
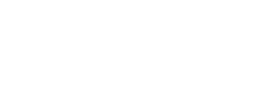
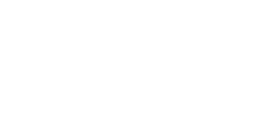
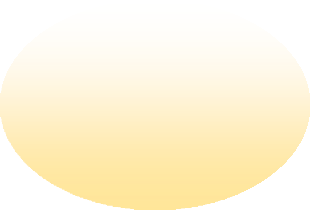
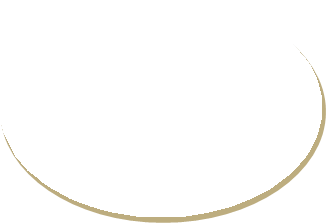
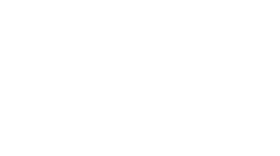
Data preprocessing

Create a Worksheet in snowflake

## EXPLANATION:

The refined representation of a process can be done in another data-flow diagram, which subdivides this process into sub-processes. `

## E-R DIAGRAM



Create dashboards

for visualization

Run the data to

create sales

table

Verify

Details

Data base

Data preprocessing

Collect Sales data and insert into snowflake manually

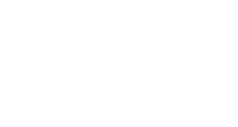
Create Worksheet in Snowflake

User

Select chart

Enter sql commands in dashboard to visualize

Visualize the sales data

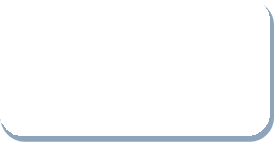
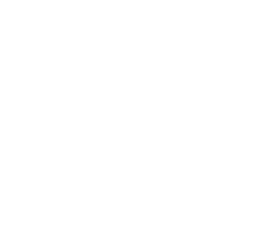
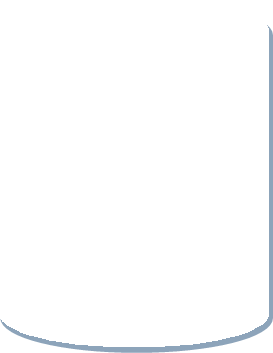
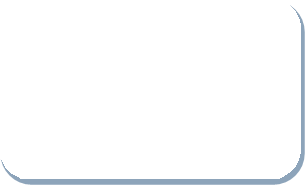


**Figure : 4.11**

## EXPLANATION:

UML is used for planning software development, and is used in many different diagrams for various purposes. ER diagrams do not focus on the software, but rather the modelling of databases, which are usually part of a software system. UML diagrams are broader, and have many uses, and ERDs only have one purpose.

## SYSTEM ARCHITECTURE



Create dashboards for

visualization

User

Enter sql commands in

dashboard to visualize

Create Worksheet in

snowflake

Database

Collect sales data and

insert into snowflake

Select chart and visualize

sales data

Data preprocessing

Run the data to create a

sales table

**Figure : 4.12**

# CHAPTER 5 DEVELOPMENT TOOLS

## 5.1 GENERAL

**Snowflake Snow sight**

Snowflake Snow sight offers a comprehensive set of tools for creating visualizations from data stored in Snowflake. It starts with selecting the data source, followed by using the query editor to write SQL queries for data extraction and manipulation. The data preview feature allows users to verify the query results before proceeding to visualization. Snow sight provides various visualization options such as bar charts, line charts, and pie charts, which can be customized to suit specific data and analysis requirements. The interactive nature of Snow sight visualizations allows for drilling down into data, applying filters, and exploring details. Users can share their visualizations through shareable links or embed them in webpages for collaboration. Additionally, Snow sight supports exporting data and visualizations in formats like CSV, Excel, and PDF for further analysis and reporting. The query editor within Snow sight enables users to craft SQL queries, leveraging Snowflake's powerful querying capabilities to extract and manipulate the data. Before creating visualizations, users can preview the data returned by their queries to ensure accuracy. Snow sight offers a wide range of visualization options, including bar charts, line charts, pie charts, and more. These visualizations can be customized extensively, allowing users to select the data fields to be displayed, set axis labels, adjust formatting options, and tailor the visual appearance to suit their needs. One of Snow sight's key strengths is its interactivity. Visualizations are interactive, enabling users to explore the data in depth. This includes drilling down into specific data points, applying filters to focus on particular subsets of data, and interacting with the visualization to gain insights. Sharing and collaboration are also integral features of Snow sight. Users can share their visualizations with others by generating shareable links or embedding the visualizations in webpages. This facilitates collaboration among team members, allowing them to collectively analyse and interpret the data.

Furthermore, Snow sight supports exporting data and visualizations in various formats, such as CSV, Excel, and PDF. This feature enables users to use the data for further analysis or reporting outside of Snowflake Snow sight, enhancing the utility of the visualizations for decision-making and data-driven insights.

### History of Snowflake Snow sight

Snowflake Snow sight, launched as part of the Snowflake platform, has emerged as a critical tool in the realm of cloud-based data warehousing since Snowflake's inception in 2012 by Benoit Dageville, Thierry Cruanes, and Marcin Zukowski. This innovative platform was designed to revolutionize the data warehousing industry with its cloud-native approach, offering users a modern, intuitive, and collaborative environment for data analysis and visualization.

Since its initial release, Snow sight has undergone significant evolution, continually enhancing its features and user experience. These enhancements have included improvements in data visualization, query building, collaboration, and integration capabilities. Users can now explore and visualize data, build and execute SQL queries, collaborate with team members, and easily share insights with others, making Snow sight a comprehensive solution for data analysis needs.

One of Snow sight's key strengths lies in its integration capabilities, allowing users to seamlessly connect with various data sources and tools. This integration extends to Snowflake's other features, such as data sharing and security capabilities, providing users with a holistic data management solution.

Snow sight's user-friendly interface, scalability, and performance have contributed to its widespread adoption among data analysts, data scientists, and business users. Its ability to simplify complex data analysis tasks and empower users to make informed, data-driven decisions has made it an indispensable tool in today's data-driven world.

In summary, Snowflake Snow sight has evolved into a powerful and versatile tool for data analysis and visualization, enabling organizations to harness the full potential of their data and drive business growth.

### Importance of Snowflake Snow sight

Snowflake Snow sight is the user interface for Snowflake, a cloud-based data warehousing platform. Snow sight provides several key benefits:

**User-Friendly Interface :** Snow sight offers a modern, user-friendly interface that allows users to interact with their data warehouse easily. It provides a visual way to explore, analyse, and visualize data.

**Collaboration:** Snow sight supports collaboration among team members. Users can share queries, dashboards, and results with others, making it easier to work together on data projects.

**Query History and Performance:** Snow sight tracks query history and provides insights into query performance. This can help users optimize their queries and improve overall performance.

**Security:** Snow sight integrates with Snowflake's security features, ensuring that data is protected. It provides granular access controls, encryption, and other security features to keep data safe.

**Integration:** Snow sight integrates seamlessly with other Snowflake services and third-party tools. This makes it easier to incorporate Snowflake into existing data workflows.

Overall, Snowflake Snow sight is essential for users of Snowflake as it provides a user- friendly interface, collaboration features, query performance insights, security, and integration capabilities.

### Features of Snowflake Snow sight

Snowflake Snow sight is a web-based interface designed to provide users with an interactive and visual way to work with data in the Snowflake Data Cloud. Here are some key features of Snow sight:

**Query Editor:** Snow sight includes a powerful SQL editor that allows users to write and execute SQL queries directly against their Snowflake data warehouse. The editor provides syntax highlighting, auto-complete, and other features to help users write queries more efficiently.

**Visualizations:** Snow sight includes built-in charting capabilities that allow users to create visualizations of their data directly within the interface. Users can create bar charts, line charts, scatter plots, and more to explore their data visually.

**Data Preview:** Users can preview the results of their queries in a tabular format directly within Snow sight. This allows users to quickly inspect the data returned by their queries and make any necessary adjustments.

**Data Sharing:** Snow sight includes features for sharing queries, visualizations, and dashboards with other users. This can help facilitate collaboration and make it easier for teams to work together on data analysis projects.

**Data Catalog:** Snow sight includes a data catalog that provides a centralized view of all the data assets within an organization. Users can use the catalog to discover, understand, and access the data they need for their analysis.

**Security and Governance:** Snow sight includes robust security and governance features that allow organizations to control access to their data and ensure that sensitive information is protected. This includes support for role-based access control, encryption, and auditing.

# CHAPTER 6 IMPLEMENTATION

## 6.1 CODE AND IMPLEMENTATION CODING:

**# CREATING DATABASE , SCHEMA AND TABLE**

create database business; create schema business.target;

-- Create the sales table CREATE TABLE sales (

order\_id INTEGER, product\_name VARCHAR(100), product\_category VARCHAR(50), quantity INTEGER,

price FLOAT, order\_date DATE

);

## # INSERT SAMPLE DATA INTO THE SALES TABLE

INSERT INTO sales (order\_id, product\_name, product\_category, quantity, price, order\_date) VALUES

(1, 'Product A', 'Electronics', 10, 50.0, '2023-01-01'),

(2, 'Product B', 'Clothing', 5, 75.0, '2023-01-02'),

(3, 'Product C', 'Electronics', 8, 100.0, '2023-01-03'),

(4, 'Product D', 'Furniture', 3, 150.0, '2023-01-04'),

(5, 'Product E', 'Clothing', 6, 80.0, '2023-01-05');

(6, 'Product F', 'Electronics', 12, 120.0, '2023-01-06'),

(7, 'Product G', 'Furniture', 4, 200.0, '2023-01-07'),

(8, 'Product H', 'Clothing', 7, 90.0, '2023-01-08'),

(9, 'Product I', 'Electronics', 15, 110.0, '2023-01-09'),

|  |  |  |  |
| --- | --- | --- | --- |
| (10, | 'Product | J', | 'Furniture', 2, 250.0, '2023-01-10'), |
| (11, | 'Product | K', | 'Clothing', 9, 70.0, '2023-01-11'), |
| (12, | 'Product | L', | 'Electronics', 6, 130.0, '2023-01-12'), |
| (13, | 'Product | M', | 'Furniture', 3, 180.0, '2023-01-13'), |
| (14, | 'Product | N', | 'Clothing', 8, 85.0, '2023-01-14'), |
| (15, | 'Product | O', | 'Electronics', 10, 140.0, '2023-01-15'), |
| (16, | 'Product | P', | 'Furniture', 5, 220.0, '2023-01-16'), |
| (17, | 'Product | Q', | 'Clothing', 4, 95.0, '2023-01-17'), |
| (18, | 'Product | R', | 'Electronics', 7, 150.0, '2023-01-18'), |
| (19, | 'Product | S', | 'Furniture', 3, 190.0, '2023-01-19'), |
| (20, | 'Product | T', | 'Clothing', 6, 100.0, '2023-01-20'); |

**#DASHBOARD CREATION STEP: #DASHBOARD 1**

SELECT

product\_category, COUNT(\*) AS num\_orders

FROM

sales GROUP BY

product\_category;

Aggregation operation to calculate the number of orders for each product category.

## #DASHBOARD 2

SELECT

order\_date,

SUM(quantity) AS total\_quantity, SUM(price) AS total\_sales\_amount

FROM

sales WHERE

order\_date BETWEEN '2023-01-01' AND '2023-01-10' -- Specify your desired date range here

GROUP BY

order\_date ORDER BY

order\_date;

Aggregation operations to calculate the total quantity and total sales amount for each order date within a specified date range.

## #DASHBOARD 3

SELECT

DATE\_TRUNC('month', order\_date) AS month, product\_category,

SUM(quantity \* price) AS total\_revenue FROM

sales WHERE

order\_date BETWEEN '2023-01-01' AND '2023-12-31' GROUP BY

month, product\_category

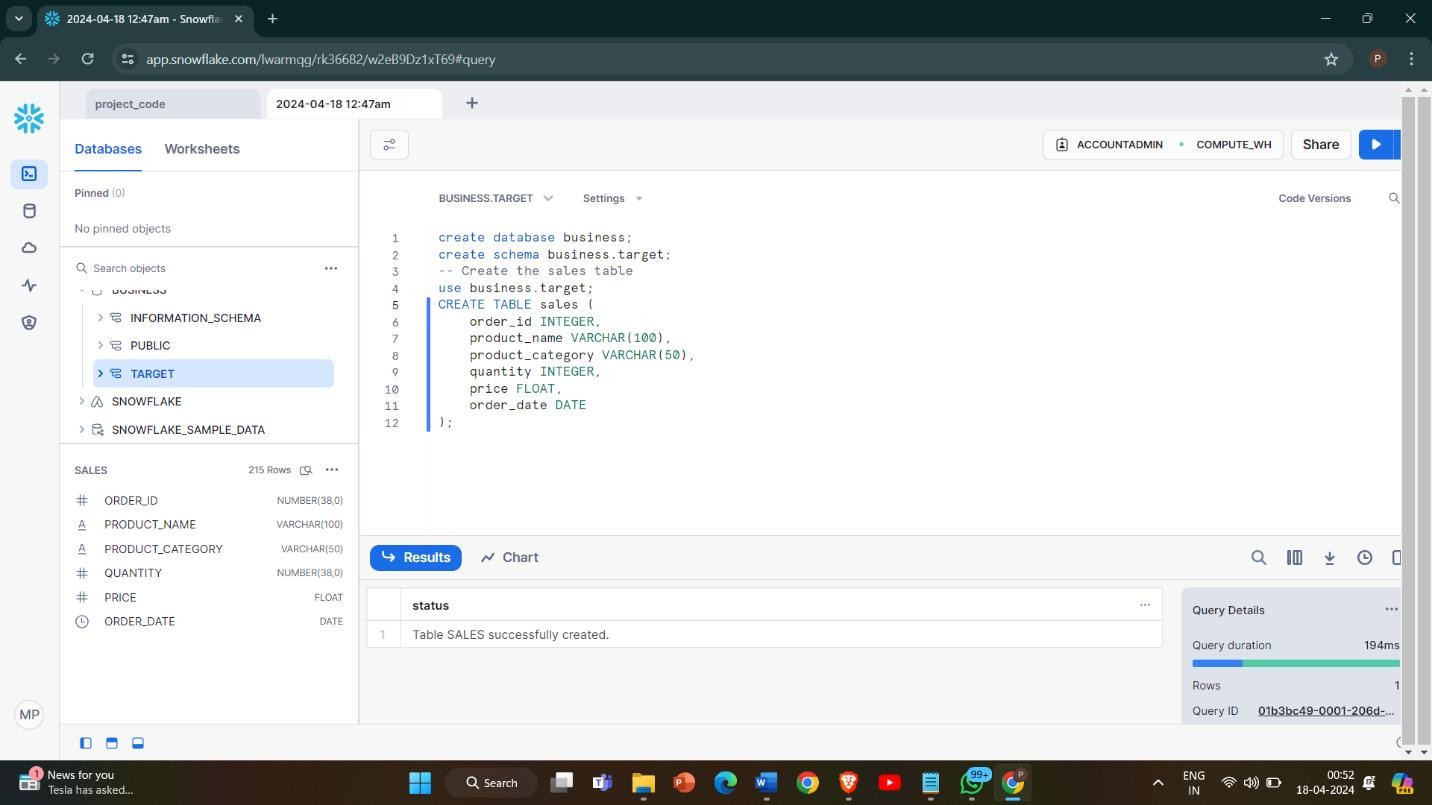
ORDER BY

month, total\_revenue DESC;

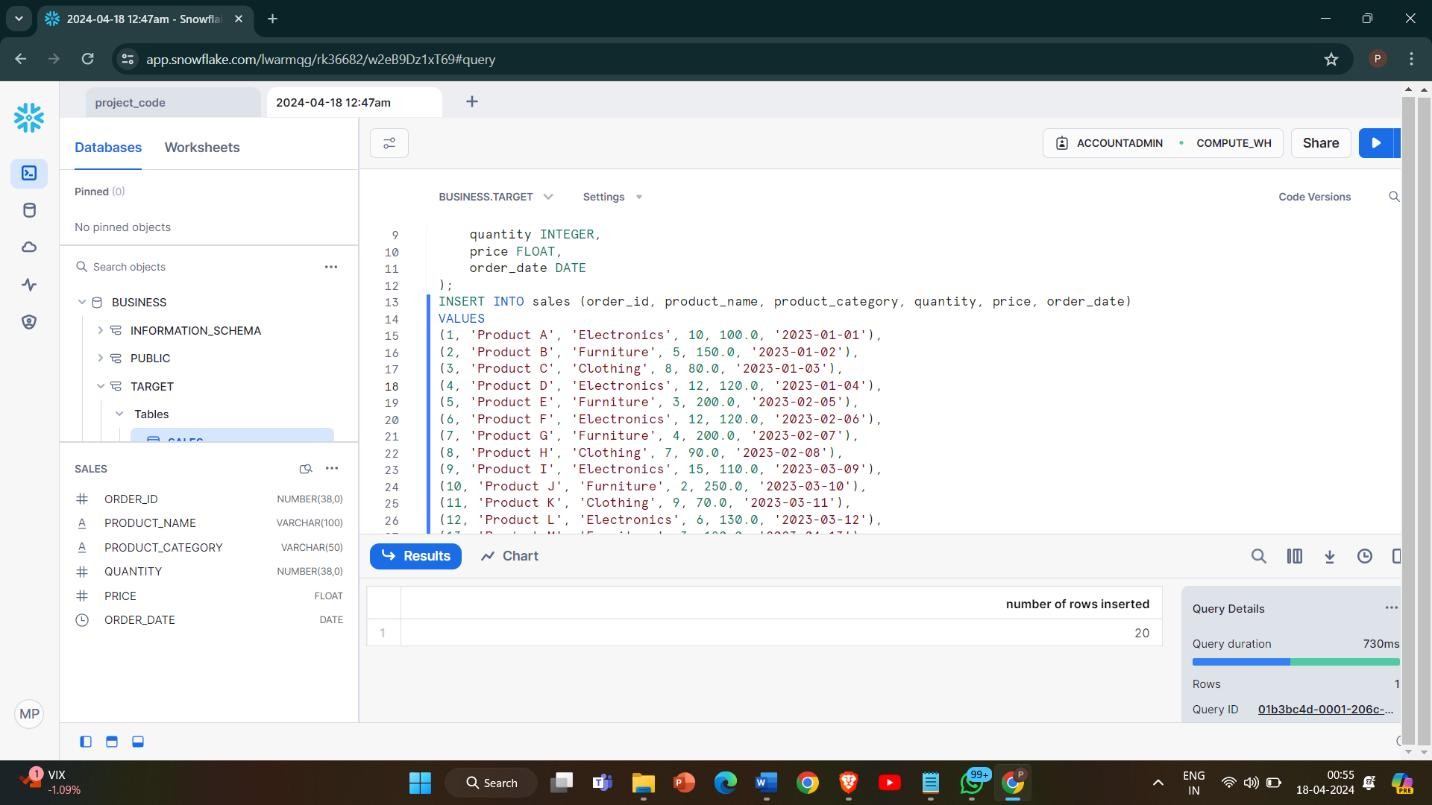
Aggregation operations to calculate the total revenue generated by each product category within each month of the year 2023.

# CHAPTER 7 SNAPSHOTS

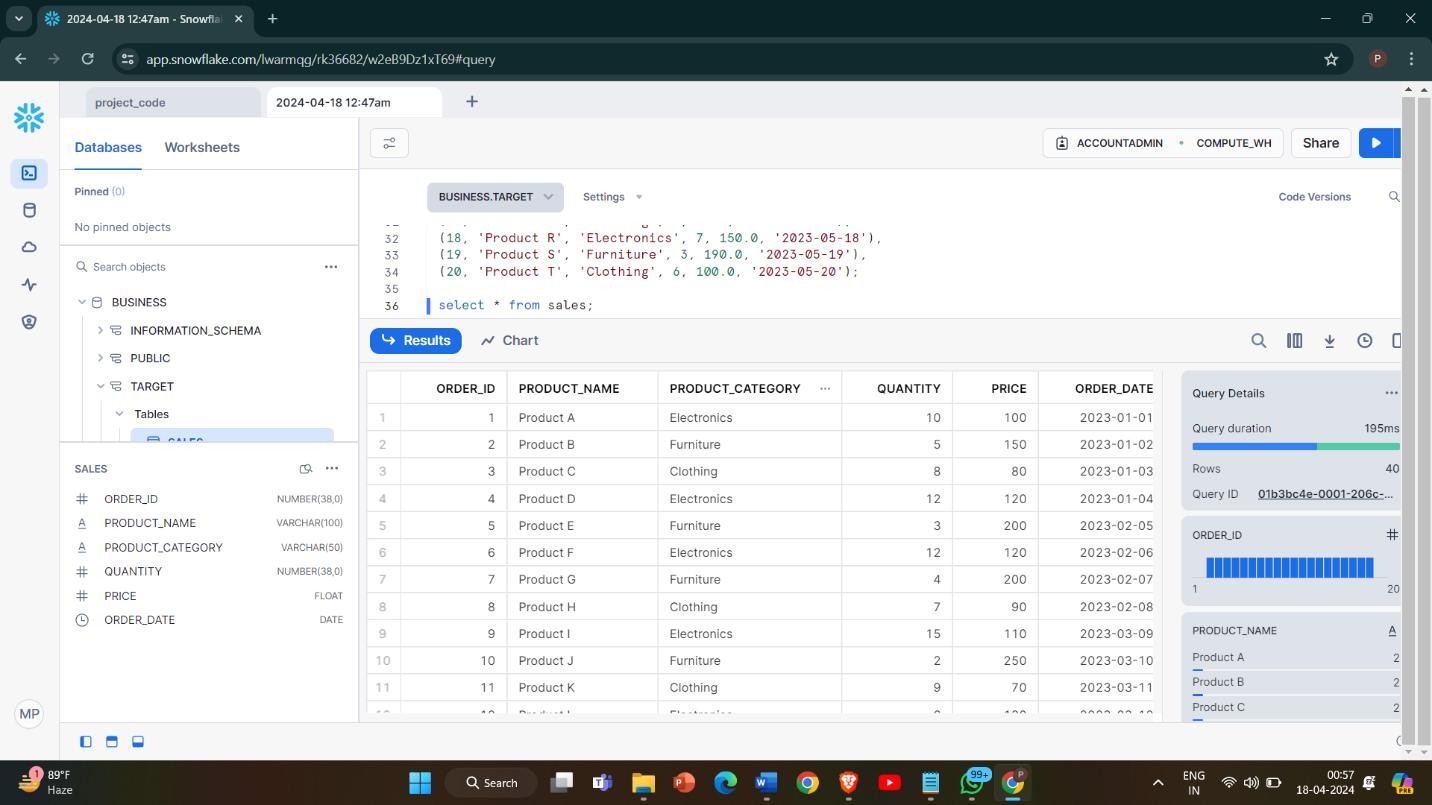
## 7.1 SNAPSHOTS



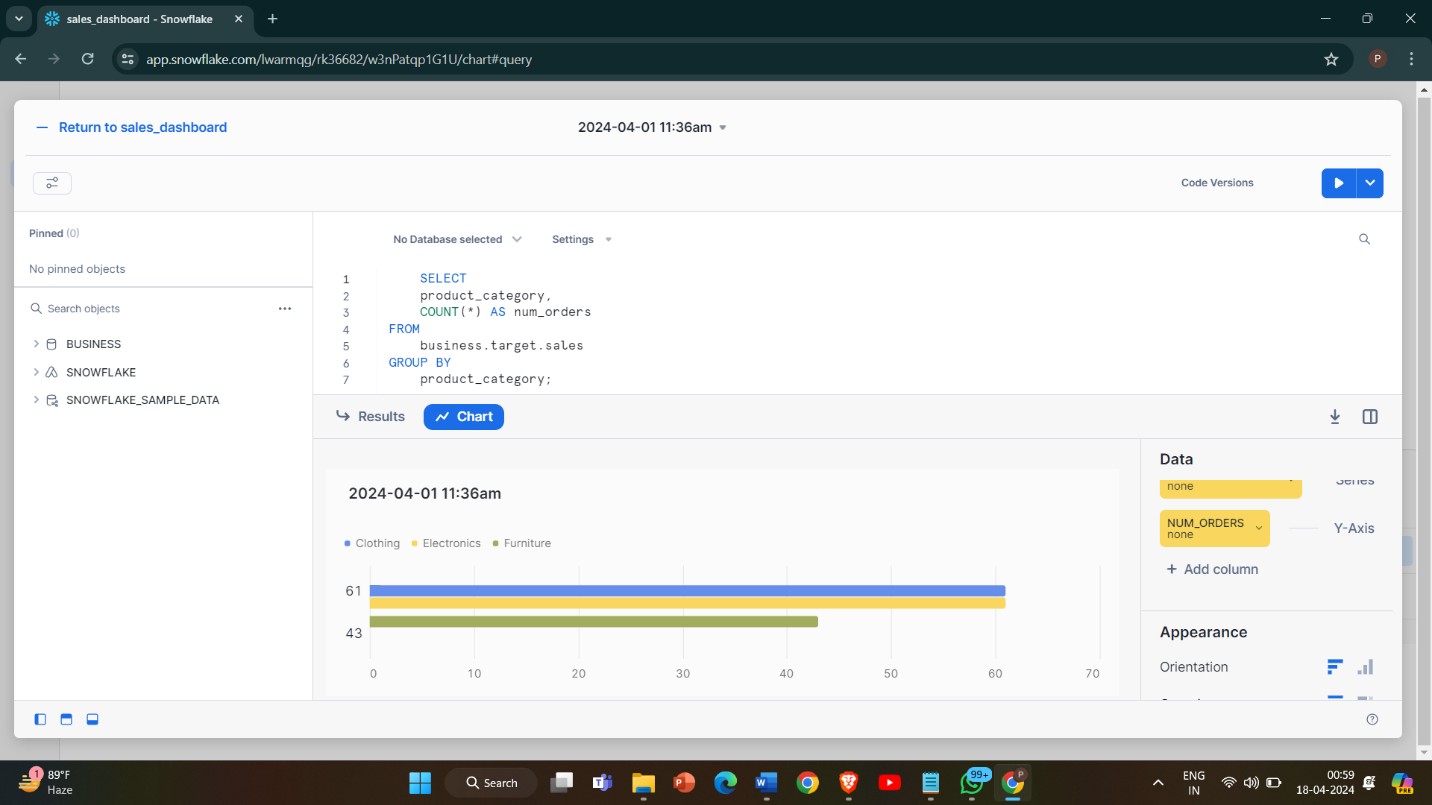
**Figure : 7.1.1 Table Creation**



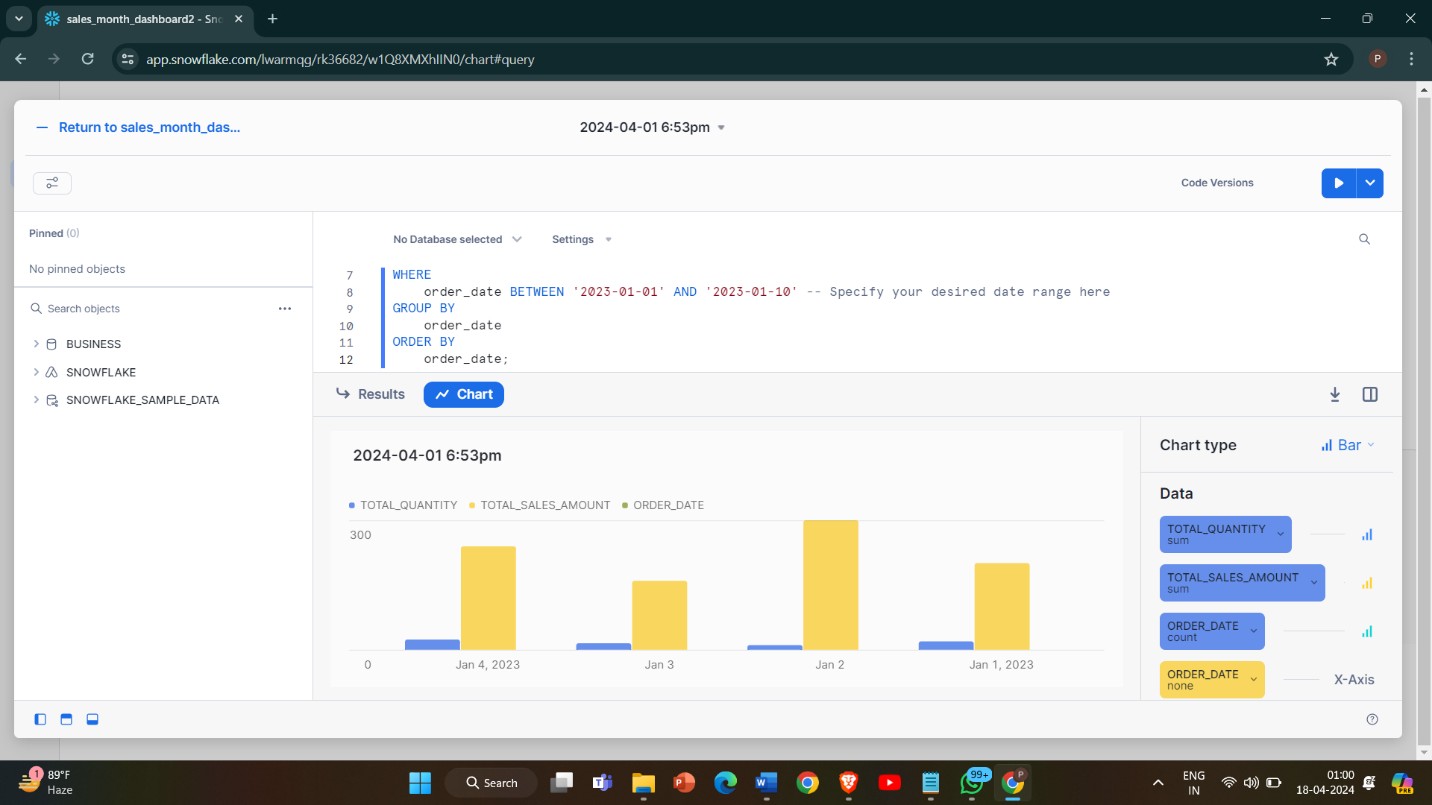
## Figure : 7.1.2 Insert Values



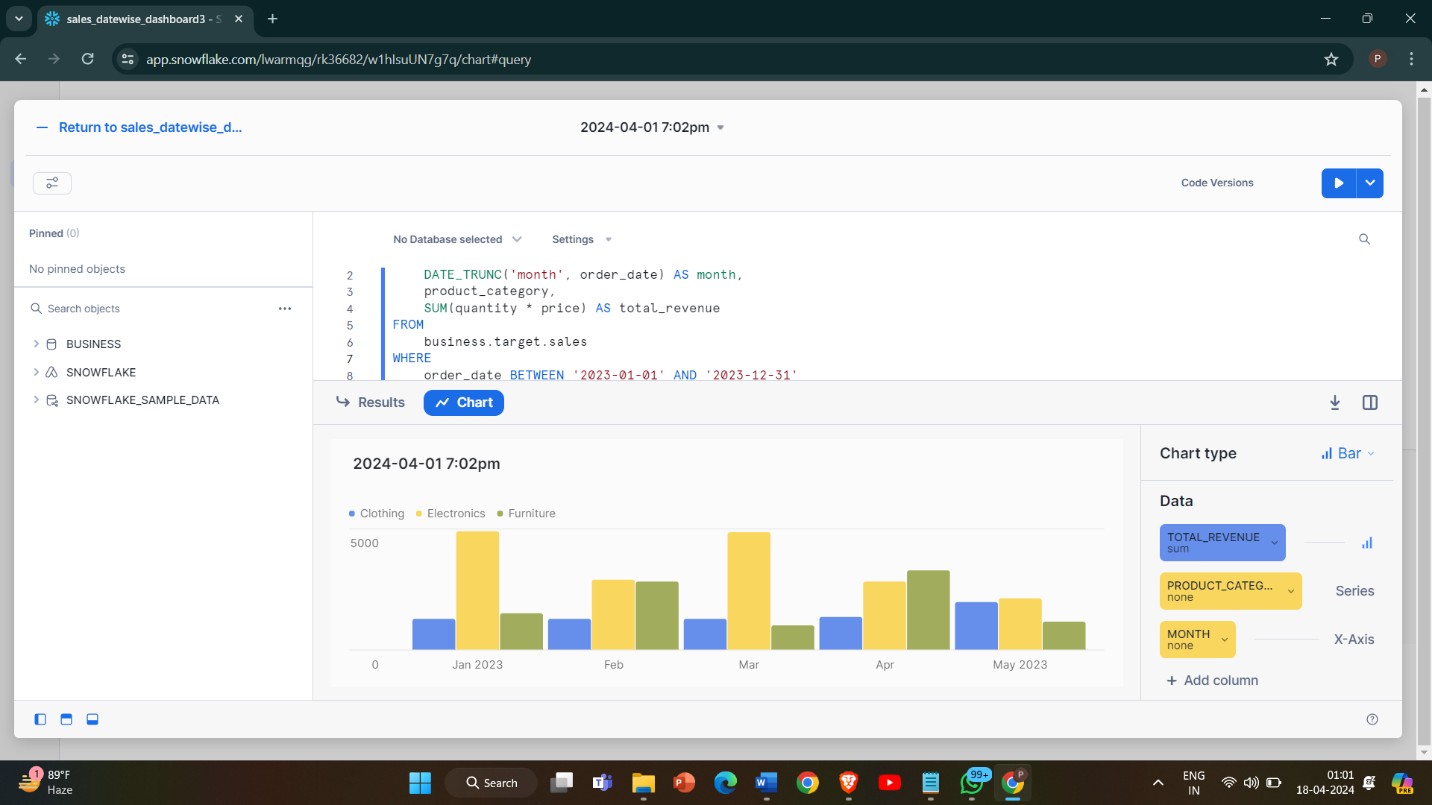
**Figure : 7.1.3 Display Table Content**



## Figure : 7.1.4 Dashboard 1



**Figure : 7.1.5 Dashboard 2**



**Figure: 7.1.6 Dashboard 3**

# CHAPTER 8 SOFTWARE TESTING

## GENERAL

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

## DEVELOPING METHODOLOGIES

The test process is initiated by developing a comprehensive plan to test the general functionality and special features on a variety of platform combinations. Strict quality control procedures are used. The process verifies that the application meets the requirements specified in the system requirements document and is bug free. The following are the considerations used to develop the framework from developing the testing methodologies.

## TYPES OF TESTING

* + 1. **UNIT TESTING**

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program input produces valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application,

and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

## FUNCTIONAL TEST

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted. Invalid Input : identified classes of invalid input must be rejected. Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised. Systems/Procedures: interfacing systems or procedures must be invoked.

## SYSTEM TEST

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

## PERFORMANCE TEST

The Performance test ensures that the output be produced within the time limits,and the time taken by the system for compiling, giving response to the users and request being send to the system for to retrieve the results.

## INTEGRATION TESTING

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

## ACCEPTANCE TESTING

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

## ACCEPTANCE TESTING FOR DATA SYNCHRONIZATION:

* + - * The Acknowledgements will be received by the Sender Node after the Packets are received by the Destination Node
      * The Route add operation is done only when there is a Route request in need
      * The Status of Nodes information is done automatically in the Cache Updation process

# CHAPTER 9 APPLICATIONS AND FUTURE ENHANCEMENT

## General:

The project to create visualizations in Snowflake Snow sight serves as a pivotal initiative to unlock the full potential of data assets within organizations. Through the utilization of Snow sight's robust features, stakeholders can delve deeper into data exploration, fostering a comprehensive understanding of intricate datasets. By generating charts, graphs, and visual representations, users gain the ability to discern trends, patterns, and outliers efficiently, facilitating data-driven decision-making processes across various business functions.

## Applications:

There are various applications for creating visualizations in Snowflake Snow sight, catering to different business needs and use cases. Here are some examples:

* + 1. **Business Intelligence Dashboards:** Snowflake Snow sight can be used to create interactive dashboards that provide real-time insights into key performance indicators (KPIs), such as sales trends, customer behavior, and operational metrics. These dashboards enable users to monitor business performance, identify trends, and make data-driven decisions quickly and efficiently.
    2. **Financial Analysis and Reporting:** Financial analysts can use Snowflake Snow sight to create visualizations that analyse financial data, such as revenue, expenses, and profitability. Visualizations can include charts, graphs, and tables that provide insights into financial performance, budgeting, forecasting, and variance analysis.
    3. **Marketing Campaign Analysis:** Marketers can leverage Snowflake Snow sight to visualize data related to marketing campaigns, including campaign performance, customer engagement, and conversion rates. Visualizations can help marketers track

the effectiveness of various marketing channels, optimize campaign strategies, and allocate resources more effectively.

* + 1. **Supply Chain Optimization:** Supply chain managers can use Snowflake Snow sight to visualize data related to inventory levels, supplier performance, and logistics operations. Visualizations can help identify bottlenecks, optimize inventory management, and improve overall supply chain efficiency.
    2. **Customer Analytics:** Snowflake Snow sight can be used to create visualizations that analyse customer data, such as demographics, purchase history, and customer satisfaction scores. Visualizations can help businesses understand customer behavior, segment customers based on their characteristics, and personalize marketing strategies and product offerings.
    3. **Healthcare Analytics:** Healthcare organizations can leverage Snowflake Snow sight to visualize data related to patient outcomes, treatment effectiveness, and healthcare costs. Visualizations can help healthcare providers improve patient care, optimize resource allocation, and identify opportunities for cost savings.
    4. **Education:** In education, Snow sight can be used for visualizing student data, academic performance, and learning outcomes. Visualizations can help in improving teaching methods and student success rates.
    5. **Transportation and Logistics:** Visualizing transportation data, such as route optimization, vehicle tracking, and delivery schedules, can help in improving logistics efficiency and customer service.
    6. **Government and Public Sector:** Visualizing data on public services, infrastructure projects, and citizen demographics can help government agencies in policy planning and decision-making.

Overall, Snowflake Snow sight offers a versatile platform for creating visualizations that enable data-driven decision-making across various industries and business functions. Whether it's monitoring performance, analysing trends, or optimizing operations, Snowflake Snow sight provides the tools and capabilities to turn raw data into actionable insights.

## FUTURE ENHANCEMENT:

Snowflake Snow sight can undergo significant enhancements to expand its visualization options and customization features, offering a wider range of visualization types like Sankey diagrams, heat maps, and network graphs. This includes providing more customization options such as color schemes, fonts, and layout settings, enabling users to tailor visualizations to their specific needs. Additionally, integrating machine learning capabilities within Snow sight would allow users to deploy predictive models directly within the platform, providing automated insights and suggestions based on the visualized data. Incorporating natural language processing (NLP) would further enhance user interaction, enabling users to explore data and gain insights using natural language queries, without needing to know complex query languages or data structures.

Enhancements in collaboration features can improve real-time editing, commenting, and sharing of visualizations across teams, facilitating better communication and collaboration among users. Advanced data preparation tools, including automated data profiling and data wrangling capabilities, can streamline data cleaning and preparation tasks, reducing the time and effort required for data preprocessing. Performance optimization measures, such as improvements in data processing algorithms, caching mechanisms, and hardware infrastructure, would ensure fast and responsive visualization experiences, particularly with large datasets.

Snow sight can also offer customization options for branding and themes, allowing users to create cohesive and personalized visualizations that reflect their organization's branding guidelines and preferences. To bolster security, Snow sight can enhance features such as role- based access controls, encryption options, and audit logs, ensuring that sensitive data is protected and that access to visualizations is controlled and monitored.

Moreover, embedding visualizations into external applications would enable users to seamlessly integrate visualizations into their existing workflows and applications.

# CHAPTER 10 CONCLUSION AND REFERENCES

## 10.1 CONCLUSION

In conclusion, Leveraging Snowflake Snow Sight for creating visualizations offers a robust and efficient solution for data exploration, analysis, and decision-making. The platform seamlessly connects to various data sources, including Snowflake data warehouses and external sources, ensuring accessibility and flexibility in data access. This capability enables users to harness data from diverse sources for analysis and visualization, enhancing the depth and breadth of insights derived from the data.

Snowflake Snow Sight's intuitive interface simplifies the process of navigating datasets and selecting relevant fields. This user-friendly approach facilitates effortless data exploration and analysis, democratizing access to data insights across the organization. Users, regardless of their technical expertise, can navigate and interact with data, fostering a culture of data- driven decision-making.

The platform offers a diverse range of visualization types and customization options, empowering users to create compelling visualizations that effectively convey insights. From bar charts to scatter plots, Snowflake Snow Sight provides the flexibility to choose the most suitable visualization for conveying specific data relationships and patterns. This versatility enables users to tailor visualizations to their unique analytical needs and communication preferences.

Integration with Snowflake's data warehouse ensures seamless data transformation and aggregation within Snowflake Snow Sight. This integration not only enhances the accuracy and consistency of visualization data but also streamlines the analytical workflow. Users can perform complex data transformations and aggregations directly within the visualization environment, reducing the need for manual data preprocessing and enhancing analytical efficiency.

Collaborative features within Snowflake Snow Sight facilitate teamwork and knowledge sharing among stakeholders. Users can share visualizations, collaborate on analysis, and provide feedback in real-time, fostering collaboration and alignment across departments and teams. This collaborative environment promotes a culture of data-driven decision-making, where insights are collectively developed and validated.

By soliciting feedback and continuously refining visualizations based on user insights, Snowflake Snow Sight supports iterative improvement. This iterative approach ensures that visualizations remain relevant and effective over time, adapting to evolving business needs and data requirements. Users can iterate on visualizations to incorporate new insights, address emerging challenges, and refine the user experience, enhancing the value delivered by Snowflake Snow Sight.

Overall, Snowflake Snow Sight serves as a powerful tool for unlocking the full potential of data stored in Snowflake's data warehouse. Its intuitive interface, diverse visualization options, seamless data connectivity, collaborative features, and continuous improvement capabilities make it a valuable asset for organizations seeking to derive actionable insights from their data. By empowering users across roles to explore and analyze data effectively, Snowflake Snow Sight drives informed decision-making and fosters business growth.

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