VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI - 590018

Internship Seminar Report on

"POSTGRESQL"

Submitted in partial fulfillment of the requirements as per VTU curriculum of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE & ENGINEERING

By

GOWRIKA G N 4AL20CS042

Under the Guidance of

Dr. Bramha Prakash H P
Associate Professor

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY
MOODBIDRI-574225, KARNATAKA

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ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

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CERTIFICATE

This is to certify that the Internship report on "POSTGRESQL" submitted by GOWRIKA G N(4AL20CS042) is work done by him and submitted during the academic year 2023–24, in partial fulfilment of the requirements for the award of the degree of BACHELOR OF ENGINEERING in COMPUTER SCIENCE AND ENGINEERING

Internship Mentor
Department of CSE

Internship Coordinator
Department of CSE

Dr Manjunath Kotari
Professor and Head of the Department

Examiners

Name

Signature

1)

2)

ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany a successful completion of any task would be incomplete without the mention of people who made it possible, success is the epitome of hard work and perseverance, but steadfast of all is encouraging guidance.

First, I would like to thank **GTS Tech Labs** for giving me the opportunity to do an internship within the organization.

The selection of Technical Seminar Topic as well as the timely completion is mainly due to the interest and persuasion of my Seminar Coordinator **Dr. Bramha Prakash H P ,** Associate Professor, Department of Computer Science & Engineering. He has been especially enthusiastic in giving his valuable guidance and critical reviews. I will remember his contribution for ever.

I sincerely thank, **Dr. Manjunath Kotari**, Professor and Head, Department of Computer Science & Engineering who has been the constant driving force behind the completion of the seminar.

I thank Principal **Dr. Peter Fernandes,** for his constant help and support throughout.

I am also indebted to **Management of Alva's Institute of Engineering and Technology, Mijar, Moodbidri** for providing an environment which helped me in completing the seminar.

Also, I thank all the teaching and non-teaching staff of Department of Computer Science & Engineering for the help rendered.

Finally I would like to thank my parents and friends whose encouragement and support was invaluable.

Gowrika G N 4AL20CS042

INTERNSHIP CERTIFICATE

GLOBE
TELESERVICES

Internship Attendance

Date - 3-05-2024

To,

Dr Manjunath Kotari

HOD of CSE department

Alva's Institute of Engineering and Technology

Mijar, Moodbidri

This is to certify that, Ms. **Gowrika G N** USN **4AL20CS042** is currently pursuing her Internship with **GTS TECHLABS** commencing on **21st Feb 2024** and ongoing. During her Internship so far, she has been exposed to different processes and she is punctual & hardworking.

Sincerely Yours: -

For **GTS Telecom Services (I) Private Limited**

Manager – Human Resources

ABSTRACT

PostgreSQL, a free and open-source relational database management system, stands out for its reliability, rich features, and commitment to SQL standards. Used for over 3 decades, it powers web services, mobile apps, and analytics applications. PostgreSQL combines the familiar structure of relational databases with object-oriented concepts for flexible data modelling. It prioritizes data integrity with ACID transactions and ensures smooth handling of concurrent users through multiversion concurrency control. Available on major operating systems, PostgreSQL's open-source nature and powerful features make it a compelling choice for diverse data management needs.

COMPANY DETAILS

GTS is a telecom solutions provider company which has been helping medium and large businesses in their success story for over a decade now, by providing top-notch, new-age telecom solutions across the globe. With our innovative approach, extensive experience, and pioneering technology, we serve all the requirements of the global telecom industry. Our roots are deep seated in voice, messaging and data service along with detailed attention towards ensuring regulatory compliance and security vulnerabilities. We have taken our expertise in international voice and SMS in the development of trusted telecom products and solutions. Our customer service delivery expertise also makes us a preferable choice for Enterprises to deploy our in-house brand GTS Techlabs built products, solutions and platform for their customers.

Fig-1.1 Logo of GTS Tech

CONTACT DETAILS:

Websites: https://gtstechlabs.com/

Headquarters: Bangalore

Year Founded: 2022

Address: RMZ Galleria, Ambedkar Colony, Yelahanka, Bengaluru, Karnataka 560065

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INTERNSHIP OBJECTIVES

Title: Internship Report: PostgreSQL Database Management Internship

Objective:
The primary objective of my internship at [Company Name] was to gain practical experience and hands-on knowledge in PostgreSQL database management. Throughout the internship, I aimed to:

1. Acquire Practical Skills: Develop proficiency in setting up, configuring, and optimizing PostgreSQL databases for various applications and use cases.

2. Understand Database Administration: Gain insights into database administration tasks such as user management, backups, replication, and monitoring.

3. Problem-Solving Abilities: Enhance problem-solving skills by troubleshooting and resolving issues related to database performance, security, and reliability.

4. Team Collaboration: Collaborate with experienced professionals to understand real-world challenges and contribute to solving them effectively within a team environment.

5. Professional Growth: Explore advanced PostgreSQL features and best practices to broaden my understanding of database management and enhance my professional capabilities.

6. Documentation and Reporting: Document my learning journey, experiences, challenges faced, and solutions implemented during the internship to create a comprehensive report for future reference and knowledge sharing.

By achieving these objectives, I aimed to not only enhance my technical skills but also contribute positively to the projects and initiatives of the organization while establishing a solid foundation for a career in database management.

CHAPTER 1

INTRODUCTION

Database structures play a crucial role in defining how data is organized, accessed, and managed within a database system. The relational model, for instance, arranges data into tables consisting of rows and columns, with relationships established between tables through keys. This model is widely adopted due to its simplicity, flexibility, and robustness in handling complex data relationships. On the other hand, hierarchical and network structures are useful for representing data with hierarchical relationships, such as organizational charts or file systems. These structures allow for parent-child relationships between records, enabling efficient navigation of data paths. Object-oriented database structures organize data as objects, similar to how they are represented in object-oriented programming languages. This approach is beneficial for applications where data and behavior are tightly coupled, facilitating easier development and maintenance.

Document-oriented databases store data as documents, typically in JSON or XML format, allowing for flexible and schema-less data storage. This structure is suitable for scenarios where data is unstructured or semi-structured, such as in content management systems or IoT applications. Key-value databases, meanwhile, store data as a collection of key-value pairs, offering high performance and scalability for applications requiring fast retrieval and storage of simple data structures.

The choice of database structure depends on various factors, including the nature of the data being stored, the complexity of relationships, performance requirements, scalability needs, and the capabilities of the database management system being used. Each structure has its strengths and weaknesses, and selecting the appropriate one is crucial for designing efficient and scalable database systems.

Fig 1.1. Database structure

Structured Query Language (SQL) serves as the cornerstone of modern data management systems, facilitating the storage, retrieval, manipulation, and administration of structured data. As an integral part of database management, SQL proficiency is essential for individuals pursuing careers in data analytics, database administration, software development, and related fields.

This introduction serves as a brief overview of SQL, outlining its significance, core components, and the role it plays in shaping data-driven decision-making processes within organizations.

1. Significance of SQL:

SQL's significance lies in its ability to provide a standardized language for interacting with relational databases, enabling users to perform a wide array of operations such as data retrieval, insertion, deletion, and modification. Its versatility and widespread adoption across various database management systems make it an indispensable tool for data professionals worldwide.

2. Core Components of SQL:

SQL comprises several key components, including Data Definition Language (DDL), Data Manipulation Language (DML), Data Control Language (DCL), and Transaction Control Language (TCL). Each component serves a specific purpose in managing and manipulating data within a relational database environment.

3. Role in Data Management:

SQL plays a pivotal role in data management by providing a standardized method for defining database schema, querying data, enforcing data integrity constraints, and administering database security. Its query capabilities allow users to extract valuable insights from large datasets, empowering organizations to make informed decisions and drive business growth.

4. Practical Applications:

From executing simple SELECT queries to complex JOIN operations and transaction management, SQL finds applications across various industries and domains. Whether it's generating reports, analyzing customer behavior, or optimizing database performance, SQL proficiency is essential for extracting actionable intelligence from data repositories.

As I embarked on my internship journey, mastering SQL became a primary objective, laying the groundwork for acquiring in-depth knowledge and practical experience in database management and data analytics. Through hands-on projects, mentorship, and collaborative learning, I aimed to harness the power of SQL to address real-world challenges and contribute meaningfully to the organization's objectives.

CHAPTER 2

PROJECT DETAILS

2.1 PROJECT AREAS/DOMAINS:

The scope of telecom services encompasses a wide range of activities and functionalities that facilitate communication, connectivity, and information exchange. This includes:

1. **Network Infrastructure:** Building and maintaining the physical infrastructure required for communication transmission, such as cables, towers, and satellites.
2. **Wireless and Wired Communication**: Providing services for both wireless (e.g., cellular networks, Wi-Fi) and wired (e.g., landline phones, broadband internet) communication.
3. **Voice Services:** Offering voice communication services through traditional phone calls, VoIP (Voice over Internet Protocol), and other technologies.
4. **Messaging Services:** Facilitating text-based communication through SMS (Short Message Service), instant messaging platforms, and email.
5. **Data Services:** Enabling the transfer of data over networks, including internet access, file sharing, and cloud services.
6. **Value-Added Services:** Providing additional services on top of basic communication, such as caller ID, voicemail, conferencing, and multimedia messaging.
7. **Internet Services:** Offering access to the internet, including web browsing, online streaming, and online gaming.
8. **Enterprise Solutions:** Providing telecom solutions tailored for businesses, including enterprise communication systems, cloud-based collaboration tools, and cybersecurity services.
9. **Mobile Services:** Offering mobile communication services, including voice, data, and messaging, as well as mobile applications and content delivery platforms.
10. **Emerging Technologies**: Exploring and implementing emerging technologies such as 5G, Internet of Things (IoT)

CHAPTER 3

METHODOLOGY

Methodology for PostgreSQL Database Management Internship:

- Orientation and Training:

Attend orientation sessions to understand the company's database infrastructure and specific PostgreSQL implementation.

- Hands-on Setup and Configuration:

Set up PostgreSQL locally or on cloud platforms like AWS or Azure to gain practical experience. Configure database settings, including authentication methods, memory allocation, and storage options.

- Database Design and Schema Creation:

Learn principles of database design and normalization to create efficient and scalable PostgreSQL schemas. Practice creating tables, defining relationships, and enforcing constraints using SQL.

- Data Manipulation and Querying:

Gain proficiency in writing SQL queries for data manipulation, retrieval, filtering, and sorting.

- Indexing and Optimization:

Understand indexing principles and techniques to improve query performance. Experiment with different indexing strategies and analyze query execution plans for optimization opportunities.

- Backup and Recovery Procedures:

Learn backup and recovery methods to ensure data integrity and disaster recovery. Practice creating database backups, scheduling automated backups, and restoring data from backups.

- Security Implementation:

Explore PostgreSQL's security features, including user authentication, role-based access control, and encryption. Implement security measures to protect sensitive data and prevent unauthorized access.

- Monitoring and Maintenance:

Familiarize with monitoring tools and techniques for tracking database performance metrics. Develop proactive maintenance routines to identify and address potential issues before they impact operations.

- Replication and High Availability:

Understand concepts of replication and high availability to ensure database reliability and fault tolerance.

- Documentation and Reporting:

Document all learning activities, experiments, and findings throughout the internship. Prepare a detailed report summarizing the internship experience, including challenges faced.

CHAPTER 4

IMPLEMENTATION

4.1 STEPS TO HACKING WEBSITE DATABASE USING SQLMAP TOOL

1.Sample Outcome

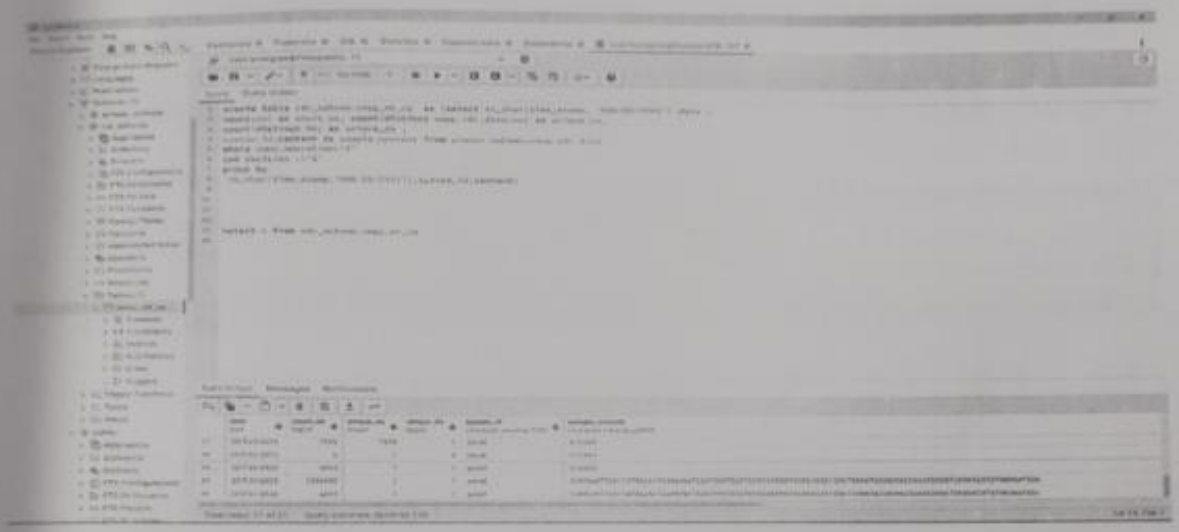


Fig 4.1 Sample Outcome

2. Changes done

Fig 4.2 Changes done

3. Updated data

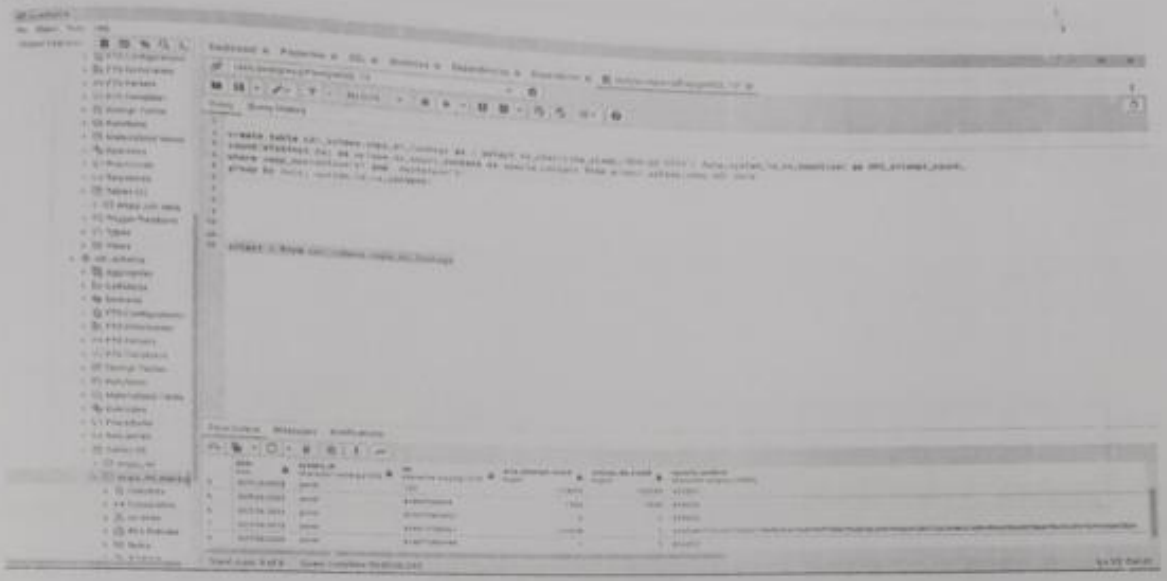


Fig 4.3 Updated done

4. Deleted data

Fig 4.4 Deleted data

5. Changes done

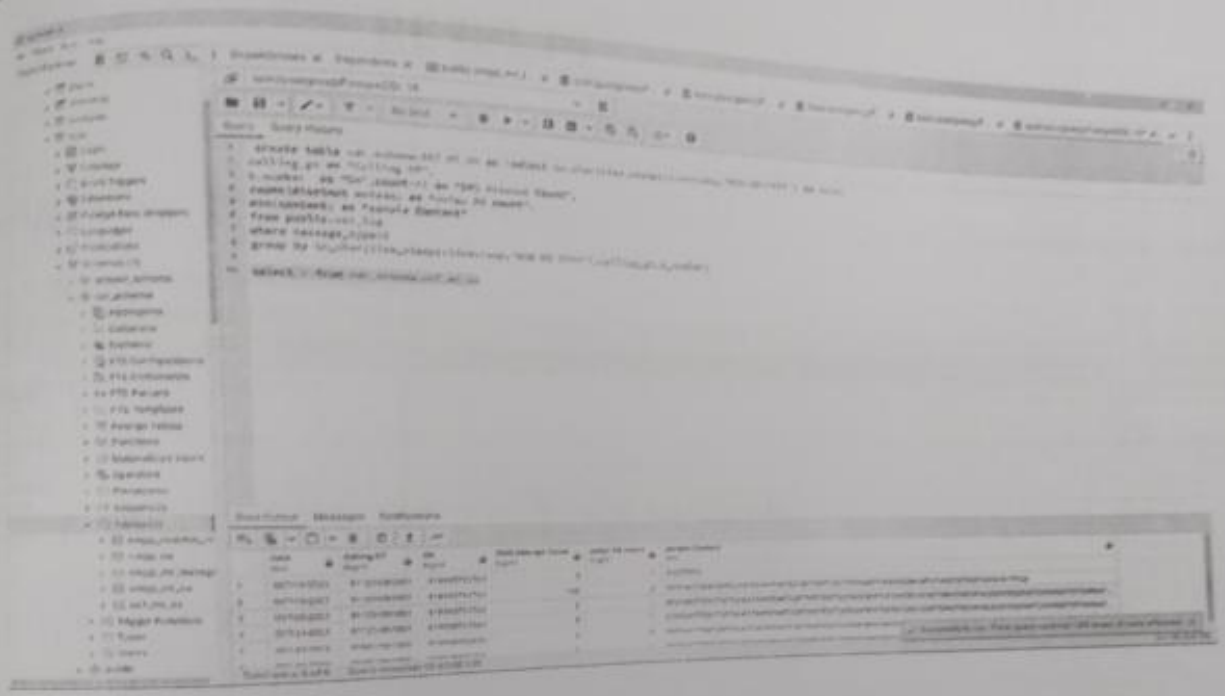


Fig 4.5 Changes done

6. Finding the data

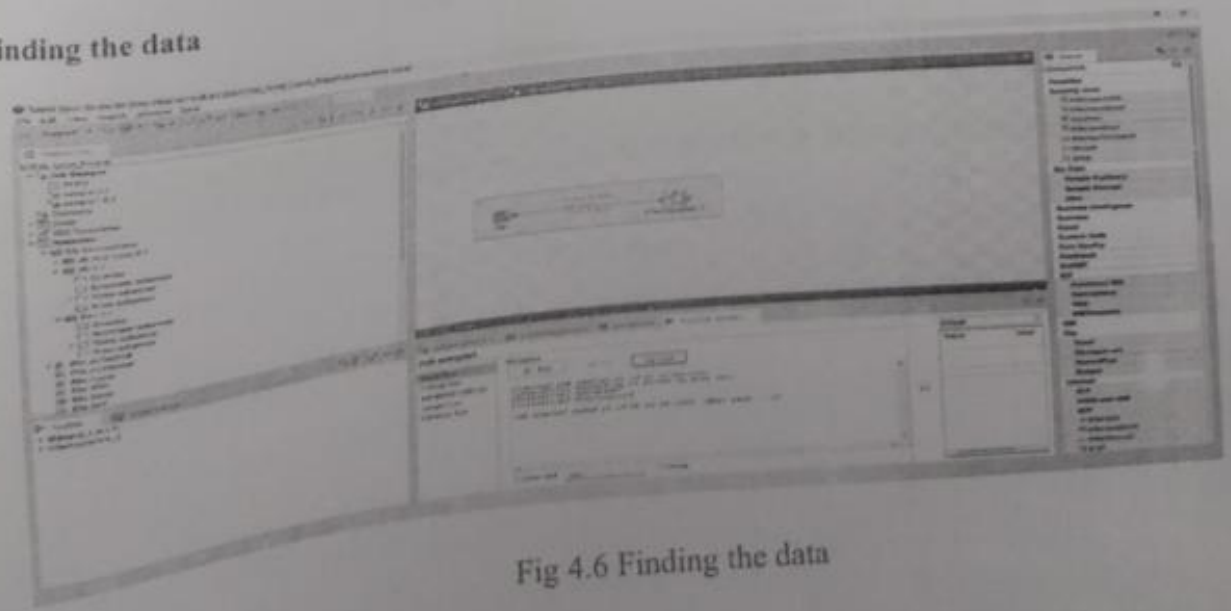
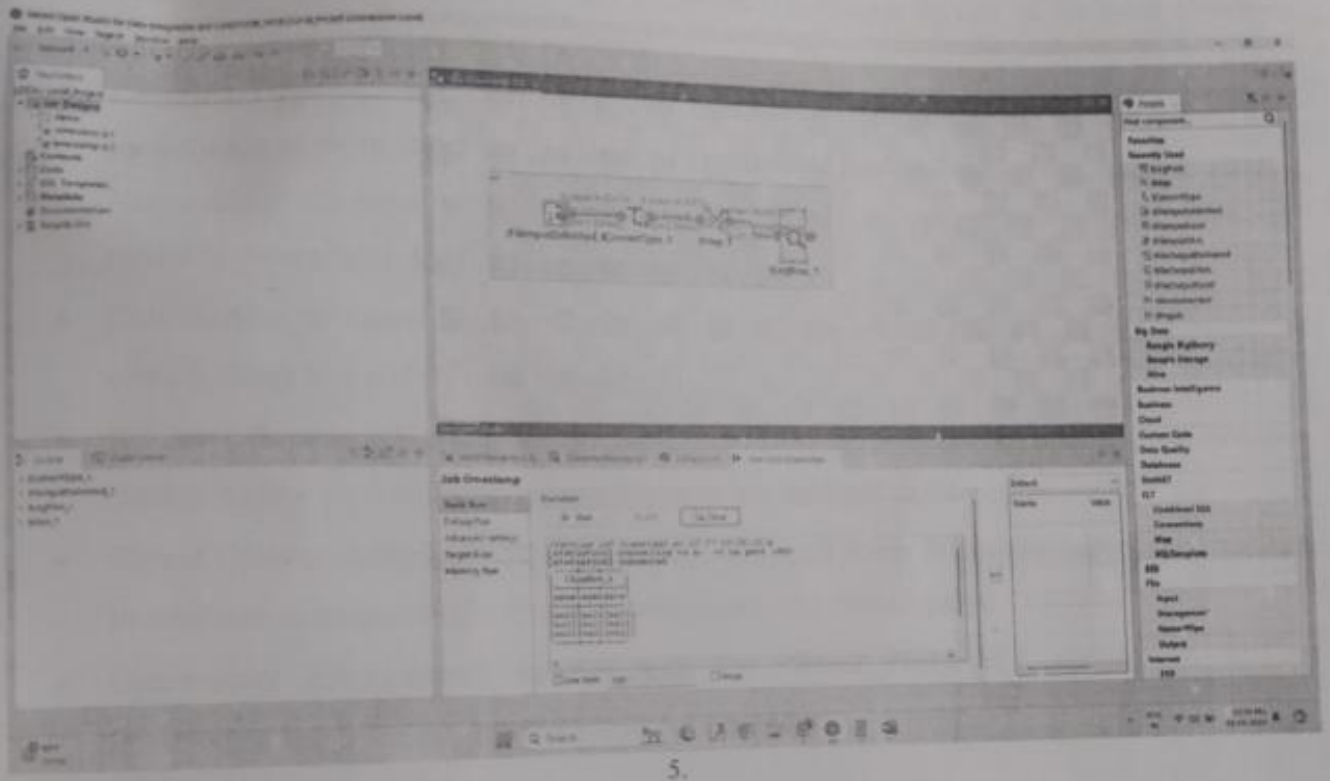


Fig 4.6 Finding the data

CHAPTER 5

RESULTS

Final Result



5.

Fig 5.1 Result

CHAPTER 6

INTERNSHIP BENEFITS

Interning with PostgreSQL offers a range of benefits:

- Hands-on Experience: Gain practical experience working with one of the most advanced open-source relational database systems.
- Learning Opportunities: Deep dive into database architecture, query optimization, data modeling, and more under the guidance of experienced professionals.
- Networking: Connect with industry experts, developers, and fellow interns, fostering valuable connections for future career opportunities.
- Contribution to Open Source: Contribute to an open-source project, making meaningful contributions to a widely used technology.
- Resume Booster: Having PostgreSQL internship experience enhances your resume, demonstrating your skills and commitment to professional development.
- Career Growth: Interning with PostgreSQL can open doors to exciting career opportunities in database management, software development, and related fields.
- Community Engagement: Engage with the vibrant PostgreSQL community, sharing knowledge and learning from others in the ecosystem.

CONCLUSION

Interning with PostgreSQL presents a compelling array of benefits for aspiring database professionals and software developers alike. Firstly, it provides invaluable hands-on experience with one of the most sophisticated open-source relational database systems available today. This practical exposure allows interns to delve deeply into PostgreSQL's architecture, its various features, and best practices for efficient database management. urthermore, interning with PostgreSQL facilitates valuable networking opportunities within the industry. Interns can connect with seasoned professionals, fellow interns, and members of the PostgreSQL community, building relationships that can lead to future collaborations, job opportunities, and professional growth. In conclusion, interning with PostgreSQL offers a comprehensive learning experience, hands-on skill development, networking opportunities, and the chance to contribute to a widely used open-source project. It equips interns with the knowledge, experience, and connections necessary for a successful career in database management and software development.