Data Analyst

A REPORT

submitted by

Santhosh Kumar Santhanam (21BCE1829)

in partial fulfilment for the award

of

B. Tech. Computer Science and Engineering

School of Computer Science and Engineering

April 2024

School of Computer Science and Engineering

DECLARATION

I hereby declare that the project entitled **"Data Analyst"** submitted by me to the School of Computer Science and Engineering, Vellore Institute of Technology, Chennai Campus, Chennai 600127 in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology – Computer Science and Engineering** is a record of bonafide work carried out by me**.** I further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma of this institute or of any other institute or university.

Signature

Santhosh Kumar S (21BCE1829)

School of Computer Science and Engineering

CERTIFICATE

The project report entitled "**Data Analyst**" is prepared and submitted by **Santhosh Kumar Santhanam** (**Register No: 21BCE1829**). It has been found satisfactory in terms of scope, quality and presentation as partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology – Computer Science and Engineering** in Vellore Institute of Technology, Chennai, India.

Examined by:

Examiner   I   **Examiner   II**

Internship Certificate

ARMSOFTECH.AIR

CIN : U72900TN2017PTC115929

ARMSOFTECH PRIVATE LIMITED

Prince Info Tech, Tower A , 2ⁿᵈ floor, No. 81B, 2ⁿᵈ Main Road, Ambattur Ind. Est. Ambattur, Chennai - 600058

November 01, 2023
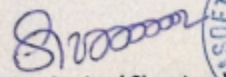
INTERNSHIP COMPLETION CERTIFICATE

We are glad to inform you that Mr. Santhosh Kumar Santhanam (21BCE1829) from Vellore Institute of Technology Chennai, has successfully completed his internship at Armsoftech Private Limited from 07-08-2023 to 01-11-2023

During his internship, he was exposed to the activities in Data Analytics & Development Team

We found his extremely inquisitive hard working. He was very much interested to learn the functions of the above said area and also willing to put his best efforts and get in to depth of subject to understand it better.

His association with us was very fruitful and we wish his all the best in his future endeavors.

For Armsoftech Private Limited

(Authorized Signatory)

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ACKNOWLEDGEMENT

First and foremost, I extend my sincere appreciation to Dr. Nithyanandam P, Head of the Department of B. Tech Computer Science and Engineering (CSE) at VIT Chennai, for his invaluable guidance, unwavering support, and insightful mentorship throughout my academic endeavours. His expertise and encouragement have been indispensable in shaping my academic and professional trajectory.

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I also want to express my gratitude to Dr. Parvathi R, Associate Dean (Academics) of the VIT Chennai School of Computer Science & Engineering, for her invaluable assistance and support during my academic journey. Her guidance has been instrumental in navigating the challenges of higher education.

Additionally, I am deeply appreciative of Dr. Geetha S., Associate Dean (Research) of the School of Computer Science & Engineering, VIT Chennai, for her encouragement and support. Her expertise in research methodologies has profoundly influenced my approach to scholarly inquiry.

Lastly, I wish to convey my admiration for the unwavering support of my family members and friends. Their sacrifices, love, and encouragement have been a constant source of strength and inspiration throughout my academic and professional pursuits.

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LIST OF ABBREVIATIONS

Abbreviation	Expansion
PowerBI	Power Business Intelligence
MySQL	My Structured Query Language
ICICI	Industrial Credit and Investment Corporation of India
AI	Artificial Intelligence
UI	User Interface
NLP	Natural Language Processing

ABSTRACT

The internship at Armsoftech Private Limited provided an immersive experience in the realm of data analytics and development, within the dynamic landscape of AI-driven solutions. Over the course of the internship, a diverse array of projects were undertaken, each contributing to the exploration and application of cutting-edge technologies in real-world scenarios.

The initial phase of the internship involved an exploration of macros and other Excel functions, laying the foundation for automation in data processing. This phase culminated in the development of an efficient attendance management system, showcasing proficiency in Excel macros and automation techniques. Subsequently, emphasis shifted towards harnessing the power of data visualisation and analysis using PowerBI. Leveraging MySQL as the database backend, a comprehensive dashboard was crafted to analyze the ICICI bank dataset, comprising millions of data points. Through the integration of JavaScript, Django, and MySQL, a bespoke dashboard solution was engineered, empowering clients with intuitive data insights.

Throughout the internship, a spirit of inquiry and dedication was exhibited, evidenced by a proactive approach to learning and mastering new technologies. The fusion of technical acumen with a commitment to understanding the intricacies of data analytics underscored the successful completion of projects within the Data Analytics & Development Team.

The internship at Armsoftech Private Limited not only provided valuable hands-on experience but also offered insights into the innovative landscape of AI and Bot Solutions. As a testament to the enriching journey, the internship served as a catalyst for personal and professional growth, paving the way for future endeavors in the dynamic field of data-driven innovation.

INTRODUCTION

In the realm of technological innovation, internships serve as pivotal experiences for aspiring professionals to gain hands-on exposure and refine their skills. This report chronicles my internship journey at Armsoftech Private Limited, a prominent player in AI and Bot Solutions in India, spanning from August 7th, 2023, to November 1st, 2023.

Within the vibrant ecosystem of Armsoftech, I had the opportunity to collaborate with the Data Analytics & Development Team, embarking on a journey marked by exploration, challenges, and growth. Over the course of my internship, I engaged in a series of projects aimed at harnessing the power of data analytics and development to address real-world challenges.

The report begins by outlining the objectives of the internship, providing context for the projects undertaken and the skills developed. From there, each project is examined in detail, highlighting the methodologies employed, challenges encountered, and outcomes achieved.

Throughout the report, emphasis is placed on the practical application of skills and the alignment of projects with the overarching goals of Armsoftech. Additionally, reflections on personal growth, lessons learned, and areas for future development are woven into the narrative, offering insights into the internship experience. Join me as we navigate through the intricacies of data analytics and development, exploring the transformative impact of my internship at Armsoftech Private Limited. Together, let us uncover the lessons learned, accomplishments achieved, and the path forward in the dynamic landscape of AI-driven solutions.

INTRODUCTION TO THE INTERNSHIP

2.1: About The Internship

During my internship at Armsoftech Private Limited, my objectives were centered around maximizing my learning experience and contributing effectively to the Data Analytics & Development Team. I aimed to achieve the following:

- Skill Development: Enhance my technical skills in data analytics, visualization, and software development, including Excel macros, PowerBI, MySQL, JavaScript, and Django.
- Real-World Application: Gain practical experience in applying data analytics techniques to real-world scenarios within AI and Bot Solutions.
- Collaboration and Networking: Collaborate with experienced professionals within the team and across departments, engaging in meaningful discussions and building professional relationships.
- Contribution to Projects: Make tangible contributions to assigned projects, demonstrating my capabilities and adding value to team efforts.

These objectives guided my approach throughout the internship, shaping my commitment to learning, collaboration, and professional development. The supportive environment and diverse opportunities provided by Armsoftech enabled me to exceed my own expectations and emerge with enhanced skills and valuable experiences.

2.2: Company Background

Armsoftech.AIR leads the AI and Bot Solutions sector in India with its rapid growth and innovative offerings, delivering exceptional Customer Experience across diverse sectors. Notable among its achievements is the development of VIDYA, India's pioneering NLP Conversational AI, proficient in 10 Indian languages, including Hinglish, showcasing the company's commitment to linguistic diversity.

The AIR Voice BOT is at the core of Armsoftech.AIR's solutions, enabling intelligent customer dialogue round-the-clock with minimal human intervention. This flagship product, alongside solutions like WhatsApp Bot, Chatbot, and CRM & Dialler, caters to diverse customer needs.

Initially focusing on BFSI, Armsoftech.AIR has expanded its client base to leading private banks, fostering strong relationships and driving innovations such as the Man-Machine Model, solidifying its position as a top-rated provider in Voice Based Services.

The company's success is driven by a diverse team of professionals with over 40 years of collective experience, collaborating to develop tailored products and services meeting clients' evolving needs.

Headquartered in Chennai, Armsoftech Private Limited diversifies into new sectors like Telecom and Insurance, driven by innovation and excellence. Recognized with prestigious awards like the ICICI Bank Innovation Award 2020 and the Economic Times Excellence Awards 2021, Armsoftech.AIR continues to lead the AI space, delivering transformative solutions nationwide.

2.3: Internship Duration and Timeline

My internship at Armsoftech Private Limited spanned from August 7th, 2023, to November 1st, 2023. Over this period, I engaged in a series of projects aimed at harnessing the power of data analytics and development to address real-world challenges within the dynamic landscape of AI and Bot Solutions.

Timeline Overview:
- August 7th, 2023 - August 21st, 2023: The initial two weeks were dedicated to exploring macros and other Excel functions for automation of basic functionalities. This phase laid the groundwork for subsequent project work.
- August 22nd, 2023 - September 4th, 2023: Following the exploration phase, the next two weeks were devoted to developing a mini-project focusing on an attendance management system using Excel macros skills acquired during the exploration phase.
- September 5th, 2023 - October 30th, 2023: For the remaining two months, I worked on a project involving PowerBI to create a dashboard analyzing the ICICI bank dataset. This involved testing using MySQL as the database to handle large datasets and creating a custom dashboard using JavaScript, Django, and MySQL.

Throughout the internship, I experienced a progression in my responsibilities and skill development, guided by the supportive environment and diverse opportunities

provided by Armsoftech Private Limited. This timeline encapsulates the duration and key milestones of my internship journey, reflecting the breadth and depth of experiences gained during this transformative period.

2.4: Roles and Responsibilities:

During my tenure with the Data Analytics & Development Team at Armsoftech Private Limited, my roles and responsibilities were diverse and impactful. I was tasked with:

- Utilizing Excel macros and other functions for automation, particularly in the development of an attendance management system.
- Employing PowerBI to create a comprehensive dashboard for analyzing the ICICI bank dataset, utilizing MySQL as the database backend.
- Collaborating with team members to ensure the successful completion of projects, including contributing to discussions, sharing insights, and providing support where needed.

2.5: Skills Development:

Throughout my internship, I aimed to enhance various skills crucial for success in the field of data analytics and development. These included:

- Technical skills in Excel macros, PowerBI, MySQL, JavaScript, Django, and other relevant tools and technologies.
- Communication skills through interactions with team members and stakeholders, presenting findings, and explaining complex technical concepts.
- Problem-solving abilities by tackling challenges encountered during project implementation and troubleshooting issues as they arose.

Armsoftech provided ample opportunities for skill development through:
- Access to training programs, workshops, and resources aimed at enhancing technical proficiency and fostering professional growth.
- Mentorship from experienced professionals within the organization, who offered guidance, feedback, and support throughout the internship.

2.6: Challenges and Learnings:

During my internship, I encountered several challenges, including:

- Technical challenges in data manipulation, visualization, and analysis, particularly when working with large datasets and complex queries in MySQL.
- Logistical challenges in managing project timelines, coordinating with team members, and ensuring the smooth execution of tasks.
- Interpersonal challenges in communication, collaboration, and navigating team dynamics.

However, overcoming these challenges provided invaluable lessons and insights, contributing to my personal and professional growth. I learned the importance of resilience, adaptability, and effective communication in overcoming obstacles and achieving success in a dynamic work environment.

2.7: Expectations vs. Reality:

Reflecting on my initial expectations of the internship and comparing them to the actual experiences and outcomes, I found:

- While I anticipated a steep learning curve and challenging projects, the reality exceeded my expectations in terms of the depth and breadth of experiences gained.
- I initially expected to primarily focus on technical skills development but found that the internship provided opportunities for holistic growth, including communication, teamwork, and problem-solving abilities.
- Overall, the internship experience not only met but exceeded my expectations, providing a rich learning journey that will undoubtedly shape my future career trajectory in data analytics and development.

THE PROJECT
Title: Analytics Dashboard Website

3.1: Project Description

The "Analytics Dashboard Website" project was conceived with the goal of establishing a robust web-based platform dedicated to data analytics and visualization. Through the adept utilization of a diverse array of tools including PowerBI, Excel macros, MySQL, and Django, the project endeavored to craft an intuitive interface facilitating seamless exploration, analysis, and interaction with data sets. By amalgamating cutting-edge technologies with user-centric design principles, the project aspired to empower users with actionable insights and enhanced decision-making capabilities.

3.2: Methodology and Approach

An overview of the methodology employed in the development of the project:

- Data Collection and Storage:
    - Data is collected from various sources and stored in the database tables using Django models (my_table, Card_data, Connect_by_Month, etc.).
    - The collected data includes information such as account details, payment status, call statistics, and product types.

- Data Processing and Preparation:
    - Django ORM methods are used to process the collected data, including filtering, aggregation, and transformation as needed.
    - Data cleaning and validation are performed to ensure accuracy and consistency in the stored data.

- Data Visualization:
    - The Django views utilize various charting libraries to visualize the processed data, such as pie charts, line charts, and radar charts.
    - Visualizations are generated dynamically based on the data retrieved from the database, providing insights into key metrics and trends.

- User Interaction and Filtering:

- ○ Users interact with the visualizations through filter options available in the UI.
- ○ Selected filters dynamically update the displayed data, allowing users to customize their view based on criteria such as paid status, zone, month, etc.

- ● Authentication and Authorization:
  - ○ User authentication is implemented using Django's built-in authentication views (LoginView, LogoutView, etc.) and user model.
  - ○ Authentication ensures that only authorized users can access the dashboard views and data.

- ● Performance Optimization:
  - ○ Efforts are made to optimize performance by reducing database queries, caching data where appropriate, and optimizing code execution.
  - ○ Performance optimizations aim to enhance the user experience by ensuring fast loading times and smooth interaction with the dashboard.

- ● Continuous Improvement:
  - ○ Regular updates and improvements are made to the project based on user feedback and changing requirements.
  - ○ Continuous integration and deployment practices may be employed to streamline the development process and ensure smooth deployment of updates.
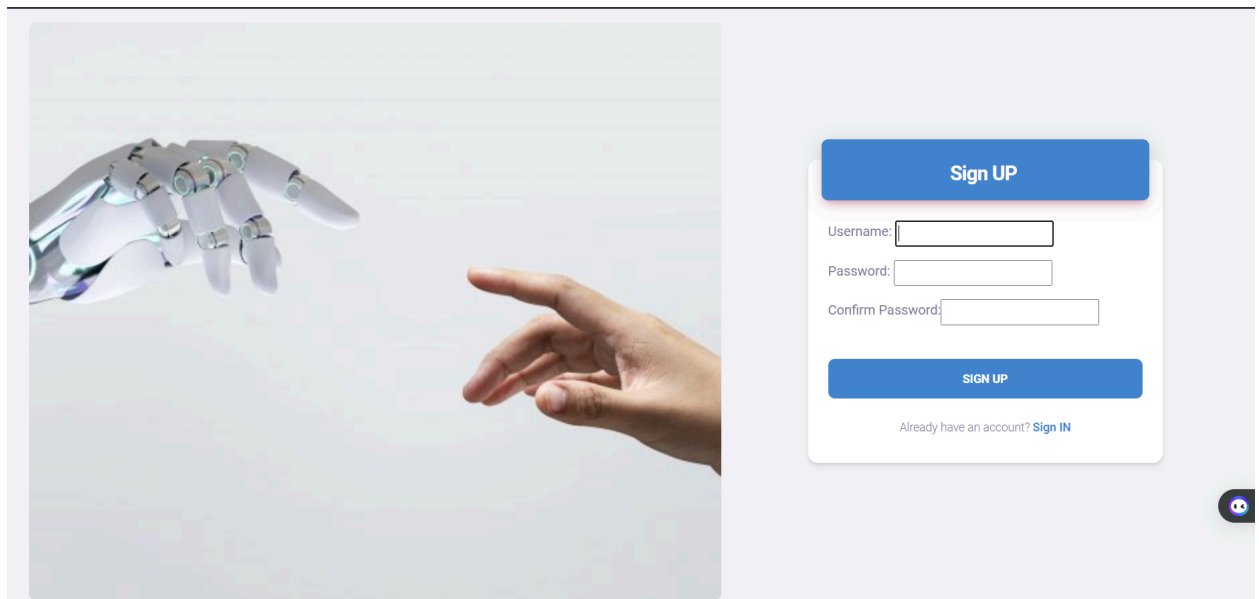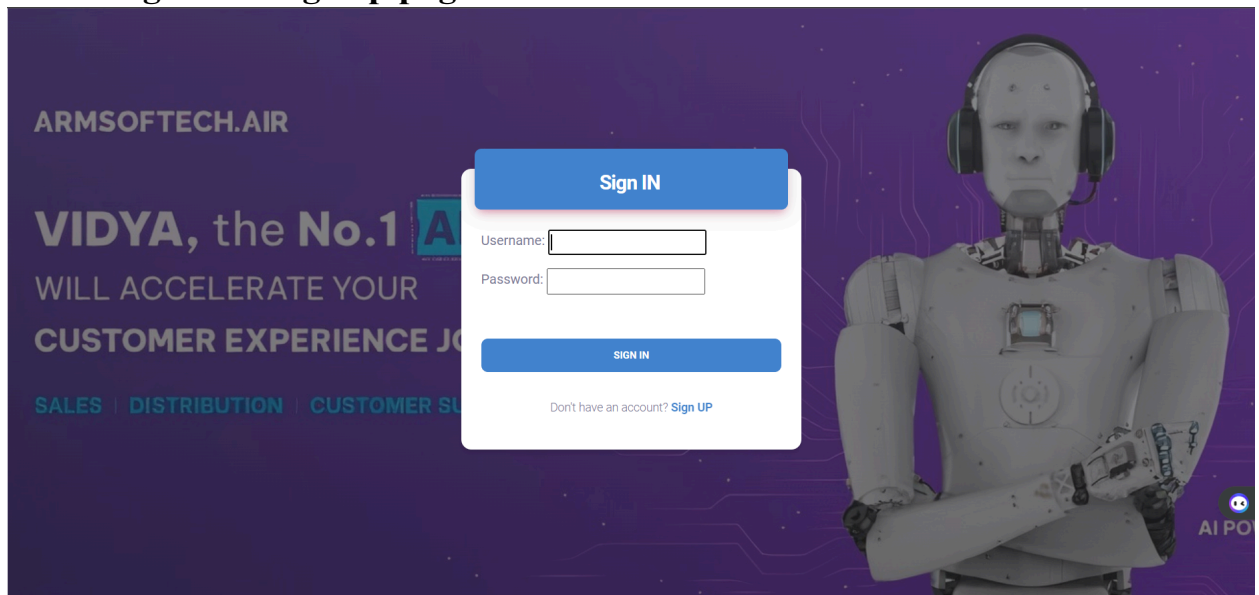
3.3: Results and Outcome

The project yielded significant results and outcomes:

- ● Comprehensive Dashboard: The developed dashboard website provided users with a comprehensive platform for data analytics and visualization. It offered interactive reports, charts, and graphs, enabling users to explore and analyze data intuitively.

- ● Efficient Data Processing: The integration of Macros and MySQL facilitated efficient data processing and management. Macros were utilized for automation, while MySQL served as a robust database backend for storing and retrieving data.
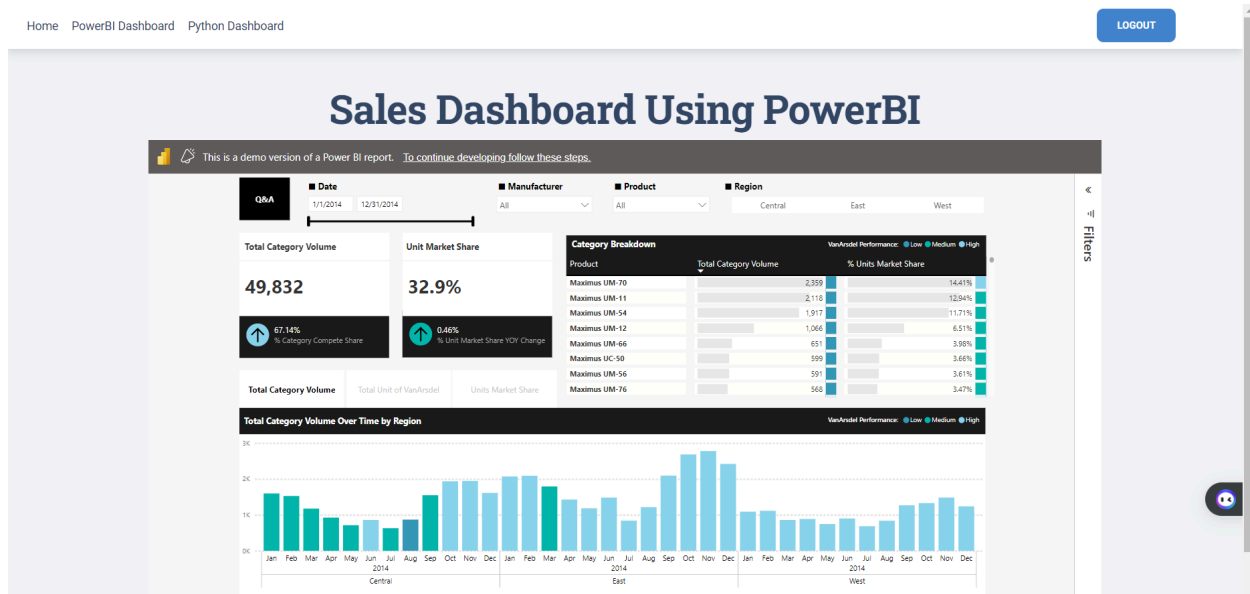
- User-Friendly Interface: The Django framework enabled the creation of a user-friendly interface with features such as user authentication, data filtering, and export functionalities. This enhanced user experience and accessibility.

1. **Login and SignUp pages:**

2. Dashboards:

1. PowerBI DashBoard:

2. Python Dashboard:

3. Python Dashboard with Filters on:

CONCLUSION

My internship at Armsoftech Private Limited has been a rewarding experience, immersing me in the dynamic world of data analytics and development. Throughout my tenure, I contributed to various projects, collaborated with talented professionals, and gained valuable insights into the AI and Bot Solutions industry in India.

Reflecting on my internship, I take pride in the achievements and contributions I made. From developing an attendance management system using Excel macros to creating a comprehensive dashboard for analyzing the ICICI bank dataset with PowerBI and MySQL, each project presented unique challenges and learning opportunities, fostering both personal and professional growth.

Working alongside a diverse team of professionals was immensely rewarding. Their knowledge, expertise, and guidance played a pivotal role in my learning journey and overall success.

This internship not only enhanced my technical skills but also developed valuable soft skills such as communication, collaboration, and problem-solving, invaluable assets for my future endeavours.

As I conclude my internship at Armsoftech, I express gratitude towards the company, supervisors, colleagues, and mentors for their unwavering support and encouragement. I eagerly anticipate future opportunities to apply the knowledge and experiences gained during my internship to contribute positively to the field of data analytics and development.

In essence, my internship at Armsoftech has been transformative, equipping me with the skills, knowledge, and confidence to pursue my career aspirations with enthusiasm. I am grateful for the experiences gained and relationships formed, excited about the possibilities that the future holds.

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APPENDIX I

A. Understanding PowerBI in Data Analytics:

PowerBI is a powerful business intelligence tool developed by Microsoft that allows users to visualize and analyze data from various sources. It enables data analysts and professionals to create interactive reports, dashboards, and visualizations, providing valuable insights into organizational data. Key features of PowerBI include:

- Data Integration: PowerBI seamlessly integrates with a wide range of data sources, including databases, spreadsheets, cloud services, and online platforms, enabling users to consolidate and analyze data from multiple sources in one place.
- Data Visualization: PowerBI offers a rich set of visualization tools and customizable charts, graphs, and maps, allowing users to create compelling visual representations of data trends, patterns, and insights.
- Interactive Dashboards: PowerBI enables users to build interactive dashboards that can be shared and accessed across teams and organizations. These dashboards provide real-time updates and drill-down capabilities, empowering users to explore data and gain deeper insights.

From a data analytics perspective, PowerBI facilitates data exploration, analysis, and decision-making by providing robust tools for data visualization, reporting, and collaboration. Its intuitive interface and powerful features make it a valuable asset for data-driven organizations seeking to leverage their data for strategic insights and actionable intelligence.

B. Understanding Excel and MySQL for Data Analytics

Macros in Excel:

Macros in Excel are automated scripts or sequences of commands that allow users to perform repetitive tasks and automate data processing workflows. In the context of data analytics, macros are commonly used to streamline data manipulation, cleaning, and analysis processes. Key aspects of macros in Excel include:

- Task Automation: Macros enable users to automate repetitive tasks such as data formatting, sorting, filtering, and calculations, saving time and reducing manual errors in data analysis workflows.
- Custom Functions: Macros allow users to create custom functions and procedures tailored to specific data analysis requirements, providing flexibility and scalability in data processing tasks.
- Integration with Data Analytics Tools: Macros can be integrated with other data analytics tools and platforms to enhance data processing capabilities and streamline workflow automation.
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From a data analytics perspective, macros in Excel serve as a valuable tool for improving productivity, efficiency, and accuracy in data manipulation and analysis tasks. By automating routine tasks and workflows, macros empower data analysts to focus on higher-level analysis and interpretation, driving insights and decision-making.

MySQL:

MySQL is an open-source relational database management system that is widely used for storing, managing, and retrieving structured data. It is commonly used in data analytics projects for storing large volumes of data and performing complex queries and analysis. Key features of MySQL include:
- Scalability: MySQL is highly scalable and can efficiently handle large datasets, making it suitable for data-intensive applications and analytics projects.
- Performance: MySQL offers high performance and speed, allowing for quick data retrieval and analysis, even with large datasets.
- Flexibility: MySQL supports various data types, indexing options, and storage engines, providing flexibility in data modeling and storage.

From a data analytics perspective, MySQL plays a crucial role in storing and managing data for analysis, enabling users to perform complex queries, joins, and

aggregations to extract insights and generate reports. Its scalability, performance, and flexibility make it a popular choice for data analytics projects across industries.

C. Understanding Django

Django is a high-level Python web framework that encourages rapid development and clean, pragmatic design. It simplifies the process of building web applications by providing a set of tools and libraries for handling common tasks such as URL routing, database interaction, and template rendering. Key features of Django include:

- Model-View-Controller Architecture: Django follows the MVC architectural pattern, separating the data model, user interface, and application logic, which promotes code organization and maintainability.
- Object-Relational Mapping (ORM): Django's ORM allows developers to interact with the database using Python objects, abstracting away the complexity of SQL queries and database management.
- Built-in Admin Interface: Django includes a customizable admin interface that provides a ready-made solution for managing application data, user authentication, and permissions.

From a data analytics perspective, Django can be used to build data-driven web applications that interact with databases, process user input, and display dynamic content. Its robust features and scalability make it well-suited for building data visualization dashboards, reporting tools, and analytics platforms that empower users to explore and interact with data in meaningful ways.