FINAL PROJECT REPORT CONTENT

PROJECT REPORT: RESTAURANT BILLING SOFTWARE

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1. Introduction

This report outlines the development of the Restaurant Billing Software; a comprehensive application designed to modernize and streamline the billing process in a restaurant environment. The primary objective was to create a robust system that handles order entry, dynamic bill calculation with taxes and discounts, and provides insightful sales reports. The project serves as a practical implementation of core software engineering principles, from database design to user interface development.

2. Abstract

The traditional method of manual billing in restaurants is often prone to errors, time-consuming, and lacks analytical capabilities. This project addresses these challenges by delivering a complete, web-based billing solution. The software captures customer orders through an interactive menu, calculates the final bill in real-time, and securely stores every transaction in a local SQLite database. Furthermore, it features a dedicated analytics dashboard that provides key business metrics, such as total revenue and most popular items, transforming raw sales data into actionable business insights. The final product is an efficient, user-friendly application that improves operational speed and provides valuable data for decision-making.

3. Tools & Technologies Used

- **Python:** The core programming language used for all backend logic and application structure.
- **Streamlit:** A modern Python framework used to build the interactive, multi-page web-based user interface.
- **SQLite3:** A lightweight, serverless SQL database engine used for persistent storage of the menu, orders, and transaction details.
- **pandas:** A powerful data analysis library used to process order data and generate insights for the report's dashboard.

4. Steps Involved in Building the Project

The project was developed systematically through a phased approach:

1. **Phase 0: Project Initialization:** The project foundation was established by selecting the technology stack, setting up a virtual environment for dependency management, and creating a clean, modular folder structure.
2. **Phase 1: Backend Development:** The backend was built first to ensure a solid logical core. This involved designing the SQLite database schema with three

normalized tables (menu, orders, order_items) and creating utility modules in Python to handle all database communications and financial calculations.

3. **Phase 2: Frontend Development:** An interactive user interface was built using Streamlit. This phase focused on creating a dynamic menu display, managing the user's session state to handle the live order, and ensuring the UI was responsive and intuitive.
4. **Phase 3: Integration & Reporting:** The frontend and backend were connected. The final bill generation logic was implemented to save transactions to the database. A separate reports page was created to fetch data, perform analysis with pandas, and visualize the results.
5. **Phase 4: Testing & Refinement:** The completed application was thoroughly tested against predefined scenarios to ensure accuracy and robustness. The UI/UX was polished to handle edge cases and provide clear user feedback.

5. Conclusion

The Restaurant Billing Software project successfully meets all its objectives. The final application is a feature-complete tool that effectively handles the entire billing workflow, from order entry to data analysis. It demonstrates the power of combining a simple database with modern Python libraries to create practical, real-world solutions. The modular architecture ensures the code is clean, maintainable, and easily extendable for future enhancements, such as user authentication or cloud deployment.