

A Project Report

On

Develop a software for Restaurant billing Project

*Submitted in partial fulfilment of the
requirement for the award of the degree of*

BACHELOR OF TECHNOLOGY



(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

Subject : Advanced Data Structures and Algorithms

Course code : (E2UC503C)

Session 2023 -24

In

CSE(AIML)

By

Name of students	Roll no.
1.Shivam Kumar Singh	22SCSE1010050
2.Vaibhav Singh	22SCSE1010550
3. Krishna Kumar	22SCSE1010086

**SCHOOL OF COMPUTING SCIENCE AND ENGINEERING DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING**

GALGOTIAS UNIVERSITY, GREATER NOIDA

INDIA

ABSTRACT

The Restaurant Billing Management System is an innovative software solution designed to optimize and automate the billing procedures within a restaurant. This project is geared towards improving operational efficiency, accuracy, and customer satisfaction by replacing traditional manual billing methods with a sophisticated digital system. With a user-friendly interface, the system facilitates seamless navigation for restaurant staff, ensuring swift and precise execution of billing tasks. It incorporates features such as order management, customizable menus, real-time updates, integration with Point of Sale (POS) systems, and support for multiple payment options. Emphasizing billing accuracy, the system minimizes errors associated with manual calculations, providing transparent and precise billing for both customers and management. Robust security measures are implemented to safeguard sensitive customer and financial data, ensuring compliance with data protection regulations. Additionally, the system offers comprehensive reporting and analytics on sales, revenue, and customer preferences, empowering restaurant owners and managers to make informed business decisions. Its scalability makes it adaptable for various restaurant sizes , fostering a more efficient, customer-centric environment and contributing to it. One of the system's key strengths lies in its emphasis on billing accuracy, aiming to minimize errors associated with manual calculations. This not only benefits customers by providing transparent and precise billing but also aids management in maintaining accurate financial records. To safeguard sensitive customer and financial data, the system incorporates robust security measures, ensuring compliance with data protection regulations. In summary, the Restaurant Billing Management System is a technologically advanced solution designed to optimize billing processes, enhance security, and provide valuable insights for better decision-making within the restaurant industry. Its implementation is expected to contribute to a more efficient, customer-focused environment, ultimately bolstering the success of restaurant businesses.

INTRODUCTION

Restaurant Billing System Using Python can be very useful within a business environment. Instead of doing manual work for making up a bill at Restaurant, which gets tiring and time consuming, you can generate a bill including tax and service charges in just few clicks. When making up a bill manually at a Restaurant may contain

some human errors like adding wrong items into the bill or summing up their total also may end up wrong, it also sometimes results into a Bad Impression towards the Restaurant from a Customer. Ideally, user should be able to generate bill without any mistakes and quickly, enabling them to fasten or improve their process. To overcome this problem, we have come up with this project, that is, Restaurant Billing System Using Python.

The Restaurant Billing System Using Python is very useful to small business or restaurant or cafe or food truck owners. This helps the owner to fasten the process which is bug free and easy to use. It also has a calculator to ease the use of the user. This project firstly has the menu and then adds up the selected items by customer and sums up the total of all items adds tax and service charges and displays total. To perform any other operation like division, multiplication, etc.

Moving on, this restaurant billing management system project in Python focuses mainly on dealing with customer's payment details with their respective food orders and amounts. Also, the system allows the selection of food and drink items for calculation and entering the quantities. But here, the project only contains Admin Panel. In an overview of this app, the system user has to select a particular food and drink item, enter a certain quantity and generate the total cost. In addition, the system generates the total bill amount with tax. Besides, the system also generates a bill receipt with a reference number. Additionally, the system also contains a mini calculator where the user can perform simple mathematics for calculation too. So with it, this simple project can perform all the important tasks for calculations of the total bill amount of the customer.

Finally, a clean and simple GUI is presented with simple color combinations for a greater user experience while using this restaurant billing system project in Python. For its UI elements, a standard GUI library; Tkinter is on board. Presenting a new restaurant/cafe billing system in Python project which includes a user panel that contains all the essential features to follow up, and a knowledgeable resource for learning purposes.

Problem definition

The Restaurant industry is enlarging rapidly, and restaurant owners are keen to improve every section of their business. Though much attention is paid to digitalizing the restaurant management and the menu, not many business owners realize the importance of applying digital billing software in the restaurant. The customer's experience at your restaurant includes the billing and payment experiences too. Billing software provides some exclusive features that ease up the restaurant services. It upgrades the billing process and uplifts the customer's experience. It enables customers to pay bills more easily. The software can generate detailed bills that eliminate the need to calculate bills separately when the guests wish to know total GST amount. Apart from billing, the software enables you to organize several processes at

the restaurant. It makes your system more effective and helps you provide faster and easy services to the customers. So many times, customers leave unhappy due to improper billing. When the crowd is vast in the restaurant, it might take you some time to generate manual bills that may leave your customers unsatisfied. This is where the automated billing system can be used. It generates digital bills automatically and allows customers to make quick payments.

PURPOSE

The Restaurant Management System helps the restaurant manager to manage the restaurant more effectively and efficiently by computerizing meal ordering, billing, and inventory control.

EXISTING SYSTEM

There is always a need of a system that will perform easy billing calculation in a grocery store. This system will reduce the manual operation required to maintain all the bills. And also generates bill receipts with unique bill numbers.

EXISTING SYSTEM DRAWBACKS

Time consuming.

Human error.

No backup records in case of loss or damage. May require specialized knowledge to maintain.

PROPOSED SYSTEM

Since many restaurant or café owners make bills for their customers manually with a pen paper. This sometimes results into an error of total or wrong items added or some items missing in bill or extra items added. This may end up by building up a bad impression of customer towards the Café or restaurant. So, to overcome this problem we've come up with this helpful project named Restaurant Billing System Using Python. We all love going to cafes or restaurants but when it takes time for them to make a bill or if they Make wrong bill then it's time consuming. So, to avoid all such chaos our project will help in All possible terms.

The key features and benefits of the proposed system include:

Automation of Billing Process:

The system automates the bill generation process, reducing the reliance on manual calculations. Automation helps in minimizing errors related to addition, subtraction, and item inclusion/exclusion.

Accuracy and Precision:

By leveraging Python programming, the system ensures accurate and precise calculations for the total bill amount. The use of algorithms and logical checks helps in minimizing billing discrepancies.

Time Efficiency:

The automated system significantly reduces the time required to generate bills compared to manual methods. Quick and efficient bill generation contributes to a positive customer experience by minimizing wait times.

User-Friendly Interface:

The system is designed with a user-friendly interface that makes it easy for restaurant or cafe staff to input order details and generate bills. Intuitive design reduces the learning curve for employees, contributing to faster adoption.

Error Handling and Validation:

The system incorporates error-handling mechanisms and validations to identify and rectify any discrepancies in the billing process. This ensures that bills are accurate and reflective of the customer's order.

Improved Customer Satisfaction:

By providing a swift and error-free billing experience, the system contributes to improved customer satisfaction. Customers are less likely to encounter issues with their bills, leading to a positive perception of the establishment.

Customization and Reporting:

The system may include features for customization of bills and the generation of comprehensive reports. Customization allows businesses to adapt the billing system to their specific needs, while reports offer insights into sales and customer preferences.

In summary, the proposed Restaurant Billing System Using Python addresses the challenges associated with manual bill generation in cafes and restaurants. By

introducing automation, accuracy, and efficiency into the billing process, the system aims to enhance overall customer satisfaction and streamline the operations of food establishments.

SYSTEM DESIGN

Overview:

The system will be a desktop application developed in Python. Utilizes a graphical user interface (GUI) for ease of use. Data storage may be implemented using a lightweight database or file storage system.

Components:

a. User Interface (UI):

Input forms for entering customer orders. Display for itemized bills and total calculations.

Options for customization (discounts, taxes, etc.).

b. Billing Engine:

Python algorithms for accurate and automated bill calculations. Error-handling mechanisms for input validation. Customizable parameters for business-specific needs.

c. Data Storage:

Store menu items, prices, and order details. Consider using SQLite or simple file storage for data persistence.

Functionality:

a. Order Processing:

Staff input customer orders through the UI. The system processes orders, calculates totals, and generates itemized bills.

b. Customization:

Allows for discounts, promotions, and tax adjustments. Customizable bill formats to accommodate business preferences.

c. Reporting:

Generate daily, weekly, or monthly reports on sales and popular items. Exportable reports for further analysis.

d. User Authentication:

Implement user roles (e.g., cashier, manager) with appropriate permissions. Secure login for authorized users.

Security:

Secure user authentication to prevent unauthorized access. Encryption for sensitive data such as login credentials. Regular updates and patches to address security vulnerabilities.

Scalability:

Design the system to handle an increasing number of menu items, orders, and transactions. Consider future integration with other systems (e.g., inventory management).

Testing:

Conduct thorough testing of the system to identify and address any bugs or issues. Implement test cases for different scenarios, including edge cases.

Documentation:

Provide comprehensive documentation for users and administrators. Include a user manual, system architecture overview, and troubleshooting guide.

Maintenance:

Establish a maintenance schedule for updates and improvements. Monitor system performance and address issues promptly. System Specifications for Restaurant Billing System Using Python:

Programming Language:

Python 3.x for backend development. Utilize a Python GUI library such as Tkinter for the user interface.

User Interface:

Intuitive forms for order entry. Clear display for itemized bills. Customization options presented in a user-friendly manner.

Billing Logic:

Algorithms for accurate calculation of totals. Error handling for input validation and correction.

Customization:

Discount and tax calculation features. Customizable bill formats.

Implementation & Result

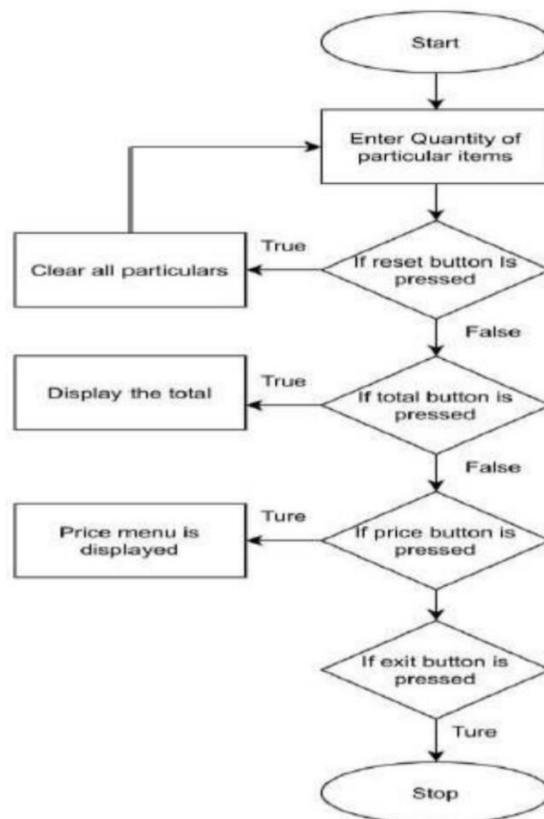


Figure 1 – flowchart of the software



Figure 2 – implementation of software

Use case Diagram.

This use case diagram is a graphical depiction of the interactions among the elements of Restaurant Billing System. It represents the methodology used in system analysis to identify, clarify, and organize system requirements of restaurant billing System. The main actors of Restaurant Billing System in this use case diagram are :-Service Manager and Customer who performs different types of use cases such as adding customer details, adding quantities for the items, generating tax, generates the bill in bill area, view bill, save the bill, searches the bill .

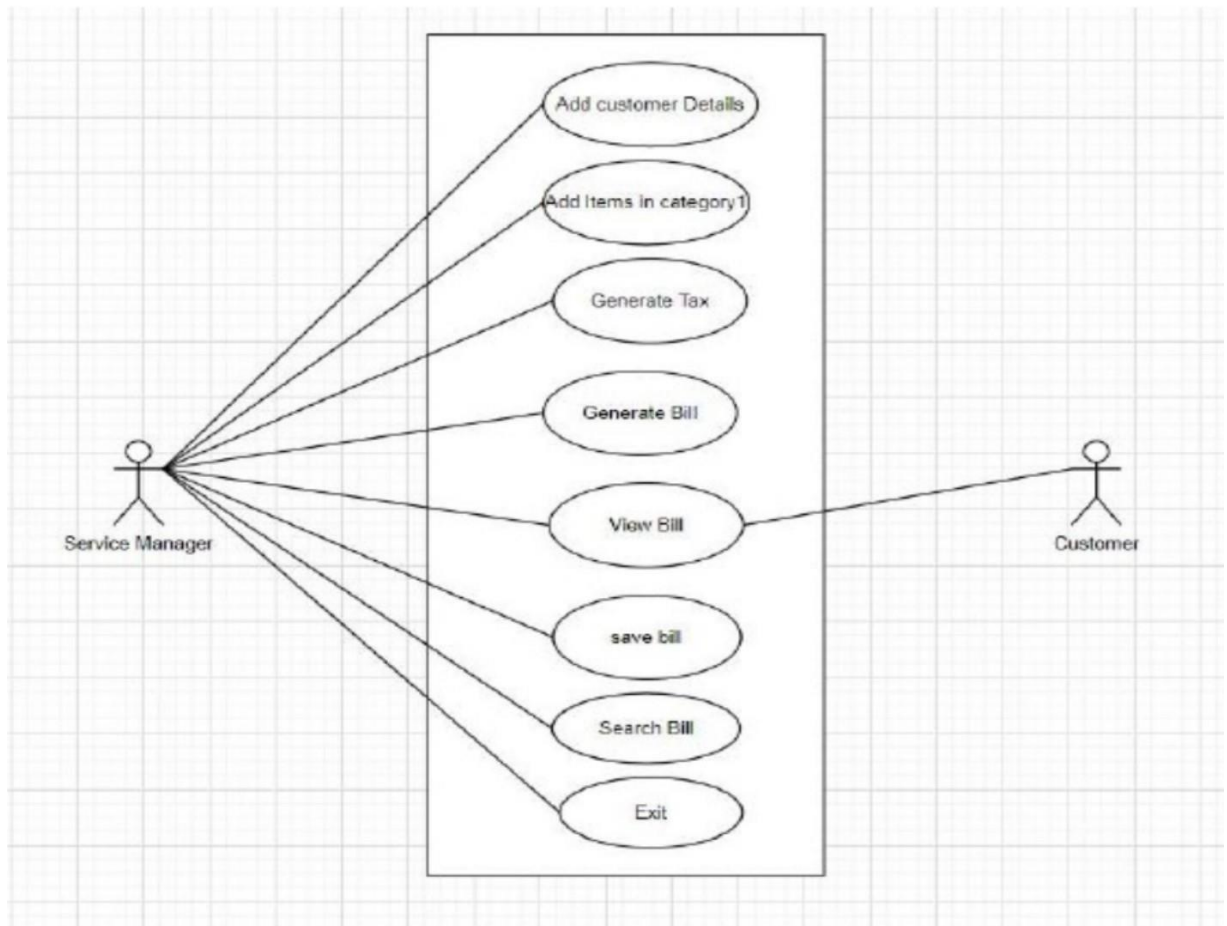


Figure 3 – use case diagram.

CONCLUSION

In conclusion, the "Restaurant Billing System Using Python" presents a practical and efficient solution to address the manual and error-prone process of bill generation in cafes and restaurants. The proposed system leverages the capabilities of Python to automate and streamline the billing process, offering several advantages for both customers and staff. By automating the calculation and generation of bills, the system significantly reduces the likelihood of errors such as incorrect totals, missing items, or unnecessary additions. This not only improves the accuracy of transactions but also contributes to a positive customer experience by minimizing wait times and potential billing disputes. The user-friendly interface ensures that staff can easily input customer orders, contributing to a faster and more efficient workflow. The incorporation of error handling and validation mechanisms adds an extra layer of reliability, further reducing the chances of mistakes in the billing process. The system's ability to interact with a database for storing menu items, prices, and order history enhances its functionality and supports future scalability. Businesses can benefit from insights provided by optional reporting features, enabling them to make informed decisions based on sales data and customer preferences. Overall, the "Restaurant Billing System " not only addresses the current challenges associated with manual billing but also lays the foundation for a more streamlined and customer-centric approach in cafe and restaurant operations. The implementation of this system has the potential to improve efficiency, accuracy, and customer satisfaction, ultimately contributing to the success and reputation of food establishments. As technology continues to play a crucial role in the hospitality industry, such automated solutions become essential for staying competitive and providing a seamless dining experience.

FUTURE WORK

In future, this application can be updated with some more food items. Many other latest features will be added. Project will surely be enhanced with respect to looks and appearance and as per user requirements. Many more functionalities will be added. Some enhancement can also be made with the calculator. For now, this application generates the bill but with respect to future application it will be enhanced that it will also print a bill. It can also be used on a large scale. Many more modifications can be made to the menu or prices or tax as well. It will be easy to use and bug free to all future or upcoming users. This can also be enhanced in future as per customer requirements. Many more features can be added. This will surely help users instead of making a bill manually. Continued development in these areas can contribute to the long-term success and relevance of the "Restaurant Billing System " in an ever-evolving hospitality industry. Regular updates and improvements will help the system adapt to changing customer expectations, technological advancements, and industry standards.

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