RESTUARANT BILLING SYSTEM

Abstract

The **Restaurant Billing System** is a Python-based desktop application designed to simplify and automate the process of generating bills in a restaurant. The system enables the user to enter food item quantities, calculate costs, apply taxes and service charges, and generate professional invoices in PDF format. All transactions are stored in a CSV file for future reference, making the system both **user-friendly and efficient**.

This project demonstrates the use of **Python GUI programming with Tkinter**, **file handling with CSV**, and **PDF generation with ReportLab**, making it an excellent beginner-to-intermediate project in software development.

Objectives

- To automate the manual process of restaurant billing.
- To provide an easy-to-use graphical interface for staff.
- To maintain records of all transactions in digital format.
- To generate professional and printable PDF receipts.
- To allow searching and reprinting of past bills when needed.

Features

1. **Graphical User Interface (GUI)** with Tkinter for easy order entry.
2. **Automatic Calculations**: Subtotal, Tax (20%), Service Charge, and Grand Total.
3. **Data Storage in CSV** (`bills.csv`) – every bill is saved for record-keeping.
4. **PDF Invoice Generation** using ReportLab with itemized details.
5. **Auto-Open PDF Receipts** in the default PDF viewer.
6. **View Past Bills**: Search bills by reference number.
7. **Export Old Bills to PDF** for reprinting invoices.

Technologies Used

- **Python 3** – Programming Language
- **Tkinter** – GUI Framework
- **CSV Module** – Data storage for billing history
- **ReportLab** – PDF invoice generation
- **OS & Platform Libraries** – Auto-opening PDF files across operating systems

System Workflow

1. **Start Application** → Opens the restaurant billing GUI.
2. **Enter Order** → Staff enters quantities of Fries, Noodles, Soup, Burger, Sandwich, and Drinks.
3. **Calculate Total** → On clicking **Total**, the system:
   o Generates a unique bill reference number.
   o Calculates subtotal, tax, service charge, and total amount.
   o Saves all details into `bills.csv`.
4. **Generate Receipt** → On clicking **Save & Open Bill (PDF)**:
   o A professional invoice is generated in PDF format.
   o PDF opens automatically for viewing or printing.
5. **Manage Past Bills** → On clicking **View Bills**:
   o Staff can see a table of all past bills.
   o Search bills by reference number.
   o Export any old bill to PDF for reprinting.
6. **Reset or Exit** → Staff can reset the form or exit the application anytime.

Advantages

- Eliminates manual billing errors.
- Saves time with automatic calculations.
- Provides professional digital receipts.
- Maintains history of all bills for auditing.
- User-friendly interface for staff with minimal training.

Limitations

- Menu items are **fixed in code** (not dynamic).
- Data storage is limited to **CSV files** (not a database).
- No support for multi-user login or role-based access.

Future Enhancements

- Add **database support** (MySQL/SQLite) instead of CSV.
- Implement **discounts, coupons, and loyalty points**.
- Add **more menu items dynamically** through admin login.
- Integrate with **POS hardware** (printers, barcode scanners).
- Add **multi-language support** for different regions.

Conclusion

The **Restaurant Billing System** successfully demonstrates the use of **Python for GUI-based applications** in real-world scenarios. It automates the billing process, reduces manual errors, and provides a professional invoicing system for restaurants. With enhancements, it can be extended into a full-fledged POS (Point of Sale) system suitable for small and medium-sized restaurants.