SUPER MARKET BILLING SYSTEM

A MINI PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report "**SUPER MARKET BILLING SYSTEM**" is the bonafide work of **"RISHIKESH T (220701226), RAJA HAREESH RG (220701226)"** who carried out the project work under my supervision.

Submitted for the Practical Examination held on _____

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ABSTRACT

The Supermarket Billing System is an advanced, user-friendly software solution designed to streamline the checkout process in retail environments. This system integrates multiple functionalities to enhance efficiency, accuracy, and customer satisfaction. Key features include Customer will select the quantity of the product and the system will display the total amount and then the order will be placed and even through we can be able to cancel the product and various payment gateway integrations. By minimizing human error and optimizing transaction speed, the system ensures a seamless shopping experience The Supermarket Billing System is scalable and customizable, making it suitable for supermarkets of all sizes, and it supports compliance with taxation and regulatory requirements. This solution represents a significant step forward in retail technology, driving operational excellence and improving overall business performance.

1. INTRODUCTION

1.1 INTRODUCTION

The retail industry continually seeks innovative solutions to enhance customer experiences and streamline operations. One such innovation is the Supermarket Billing System, an advanced, user-friendly software designed to revolutionize the checkout process in retail environments. This system incorporates a range of functionalities aimed at improving efficiency, accuracy, and customer satisfaction.

At its core, the Supermarket Billing System allows customers to select product quantities, view the total amount, and place orders with ease. It also offers the flexibility to cancel products if necessary, ensuring a hassle-free shopping experience. The name of the customer and the total amount they have purchase and the date will be stored in the data base and the excel sheet.

By minimizing human error, the Supermarket Billing System significantly enhances the efficiency of checkout operations. Its scalability and customizability make it an ideal solution for supermarkets of all sizes, while its compliance with taxation and regulatory requirements ensures smooth and lawful business operations.

This system represents a significant advancement in retail technology, driving operational excellence and improving overall business performance. Through its comprehensive features and user-centric design, the Supermarket Billing System sets a new standard for retail billing solutions, offering substantial benefits to both retailers and customers.

1.2 OBJECTIVES

1. Streamline Checkout Process:
   - Develop a user-friendly interface for efficient and accurate checkout in retail environments.
   - Implement automated systems to minimize human error and optimize transaction speed.

2. Enhance Customer Experience:
   - Enable customers to select product quantities and view the total amount before placing orders.
   - Provide options for customers to cancel products if needed, ensuring flexibility and convenience.

3. Integrate Payment Gateways:
   - Support multiple payment gateway integrations to facilitate a variety of transaction methods.
   - Ensure secure and efficient processing of payments to enhance customer satisfaction.

4. Ensure Scalability and Customization:
   - Design the system to be scalable, catering to supermarkets of all sizes.
   - Allow customization to meet specific business needs and preferences.

5. Compliance and Accuracy:
   - Ensure the system complies with taxation and regulatory requirements to avoid legal issues.
   - Maintain accurate billing and inventory management to support business operations.

6. Improve Operational Efficiency:
   - Implement functionalities that enhance overall business performance and operational excellence.
   - Use data analytics to provide insights into sales trends and customer preferences, aiding strategic decision-making.

7. Promote Technological Advancement:
   - Introduce a cutting-edge solution that represents a significant step forward in retail technology.
   - Continually update and improve the system to keep up with technological advancements and industry standards.

1.3 MODULES

1. Introduction
- Overview: Introduction to the Supermarket Billing System as an advanced, user-friendly software solution designed to streamline the checkout process in retail environments.
- Objectives: Enhance efficiency, accuracy, and customer satisfaction in the billing process.

2. Key Features
- Product Selection and Quantity:
  - Functionality: Allows customers to select the quantity of products.
  - Display Total Amount: System displays the total cost of the selected products.
  - Order Placement: Facilitates the placement of orders.
- Order Management: Product Cancellation: Customers can cancel products from their order if needed.
- Payment Integration: Multiple Payment Gateways: Supports various payment options for flexibility in transaction processing.

3. System Benefits
- Efficiency: Optimizes transaction speed, reducing checkout time.
- Accuracy: Minimizes human error in the billing process.
- Customer Satisfaction: Ensures a seamless and pleasant shopping experience.

4. Scalability and Customization
- Scalability: Suitable for supermarkets of all sizes, from small stores to large chains.
- Customization: Configurable to meet specific business needs and preferences.

5. Compliance and Regulatory Support
- Ensures adherence to taxation and regulatory requirements relevant to the retail industry.

6. Technical Specifications
- Architecture: Overview of the system architecture, including hardware and software requirements.
- Integration Capabilities: Details on integration with existing systems and third-party services.

7. Implementation and Deployment
- Installation: Steps for installing the system in a supermarket.
- Configuration: Guidelines for configuring the system according to the supermarket's requirements.
- Training: Training programs for staff to efficiently use the system.

8. Data Analytics and Reporting
- Provides insights into sales trends, inventory management, and customer preferences.

9. Maintenance and Support
- Ongoing Support: Details on customer support and maintenance services.
- Updates: Information on system updates and enhancements.

10. Conclusion

- Summary of the Supermarket Billing System’s impact on retail technology, emphasizing its role in driving operational excellence and improving overall business performance.

2. SURVEY OF TECHNOLOGIES

2.1 SOFTWARE DESCRIPTION

Software Description: Supermarket Billing System

The Supermarket Billing System is a cutting-edge, user-friendly software solution meticulously designed to streamline and enhance the checkout process in retail environments. This comprehensive system integrates a multitude of functionalities aimed at boosting efficiency, accuracy, and customer satisfaction.

Key Features:

Product Quantity Selection: Customers can easily select the quantity of each product they wish to purchase. The system promptly displays the total amount, facilitating a transparent and straightforward transaction process.

Order Placement and Cancellation: Customers can place orders seamlessly and have the flexibility to cancel products if needed, enhancing the overall shopping experience.

Payment Gateway Integrations: The system supports various payment gateways, offering multiple payment options to customers and ensuring smooth and secure transactions.

Error Minimization and Speed Optimization: By automating key processes, the system reduces human error and optimizes transaction speed, leading to a more efficient checkout experience.

Scalability and Customization:

The Supermarket Billing System is designed to be scalable and customizable, making it an ideal solution for supermarkets of all sizes. Its flexible architecture allows it to adapt to the specific needs and requirements of different retail environments.

Compliance and Analytics:

Regulatory Compliance: The system supports compliance with various taxation and regulatory requirements, ensuring that all transactions adhere to legal standards.

Data Analytics: Equipped with robust data analytics capabilities, the system provides valuable insights into sales trends, inventory levels, and customer preferences, aiding in strategic decision-making.

Benefits:

By implementing the Supermarket Billing System, retailers can achieve significant improvements in operational efficiency, customer satisfaction, and overall business performance. This solution represents a significant advancement in retail technology, driving operational excellence and setting a new standard for the industry.

2.2 LANGUAGES

1. SQL

2. PYTHON

3. REQUIREMENTS AND ANALYSIS

Requirement and Analysis for the Supermarket Billing System

1. Introduction:

The Supermarket Billing System is designed to streamline the checkout process, improving efficiency, accuracy, and customer satisfaction. This system is intended to handle various tasks associated with billing and checkout, including product selection, order placement, cancellations, and payment processing.

2. Functional Requirements:

2.1 Product Selection and Display:

- Customers must be able to select the quantity of each product.

- The system must display the total amount based on the selected quantities.

- The system should update the total amount dynamically as quantities change.

2.2 Order Placement:

- Once the customer confirms their selection, the order should be placed in the system.

- The system must generate an order summary and display it to the customer.

2.3 Product Cancellation:

- Customers must have the ability to cancel products from their order before final payment.

- The system should update the total amount accordingly upon cancellation.

2.4 Payment Gateway Integration:

- The system must integrate with various payment gateways to process payments.

- The system should handle payment verification and confirmation.

2.5 Inventory Management:

- The system should automatically update inventory levels based on orders placed.

- Real-time inventory tracking is required to prevent stockouts and overselling.

2.6 Taxation and Compliance:

- The system must comply with local taxation laws and regulations.

- It should automatically calculate applicable taxes for each transaction.

2.7 Data Analytics:

- The system should collect and analyze sales data.

- It should generate reports on sales trends, customer preferences, and inventory levels.

3. Non-Functional Requirements:

3.1 Usability:

- The system must have a user-friendly interface that is easy to navigate.

- It should provide clear instructions and feedback to users.

3.2 Scalability:

- The system should be scalable to accommodate supermarkets of different sizes.

- It should handle a high volume of transactions without performance degradation.

3.3 Security:

- The system must ensure secure handling of customer data and payment information.

- It should comply with data protection regulations and standards.

3.4 Performance:

- The system must process transactions quickly to avoid delays at checkout.

- Response times for all operations should be minimal.

3.5 Reliability:

- The system should be reliable with minimal downtime.

- It should include mechanisms for data backup and recovery.

4. Analysis:

The Supermarket Billing System must integrate seamlessly with existing supermarket operations. It should enhance the customer experience by making the checkout process faster and more accurate. The key functional requirements focus on providing a smooth and efficient transaction process, while non-functional requirements ensure the system is user-friendly, scalable, secure, and reliable.

To achieve these goals, the development process should involve:

- Detailed requirement gathering with input from stakeholders.

- Iterative design and testing to ensure usability and functionality.

- Implementation of robust security measures to protect sensitive data.

- Regular updates and maintenance to address any issues and improve performance.

By meeting these requirements, the Supermarket Billing System will significantly improve operational efficiency and customer satisfaction, thereby driving business success in the retail sector.

3.1 REQUIREMENT SPECIFICATION

1. Introduction

1.1 Purpose

The purpose of this document is to outline the functional and non-functional requirements for the Supermarket Billing System, an advanced, user-friendly software solution designed to streamline the checkout process in retail environments.

1.2 Scope

This specification covers the features and requirements for the development, deployment, and operation of the Supermarket Billing System. The system will enhance efficiency, accuracy, and customer satisfaction in supermarkets of all sizes.

2. Functional Requirements

2.1 Product Selection and Quantity Management

- FR1: The system shall allow customers to select the quantity of products.

- FR2: The system shall display the total amount based on the selected quantity.

2.2 Order Placement

- FR3: The system shall facilitate the placement of orders after product selection.

2.3 Product Cancellation

- FR4: The system shall provide an option to cancel selected products before finalizing the purchase.

2.4 Payment Gateway Integration

- FR5: The system shall integrate with various payment gateways to support different payment methods (e.g., credit/debit cards, digital wallets, cash) it is based on the shop which payment gateway.

3. Non-Functional Requirements

3.1 Performance

- NFR1: The system shall process transactions quickly to minimize customer wait times.

3.2 Usability

- NFR2: The system shall have an intuitive and user-friendly interface for both customers and supermarket staff.

3.3 Scalability

- NFR3: The system shall be scalable to accommodate supermarkets of different sizes and transaction volumes.

3.4 Customizability

- NFR4: The system shall be customizable to meet the specific needs of different supermarkets.

3.5 Compliance

- NFR5: The system shall comply with all relevant taxation and regulatory requirements.

4. System Features

4.1 Inventory Management

- SF1: The system shall support real-time inventory management to track product availability and update stock levels automatically.

4.2 Pricing Updates

- SF2: The system shall allow dynamic pricing updates to reflect discounts, promotions, and price changes.

4.3 Data Analytics

- SF3: The system shall offer data analytics capabilities to provide insights into sales trends, customer preferences, and inventory turnover.

5. Technical Requirements

5.1 Hardware Requirements

- TR1: The system shall be compatible with standard point-of-sale hardware including barcode scanners, receipt printers, and cash drawers.

5.2 Software Requirements

- TR2: The system shall run on commonly used operating systems (e.g., Windows, Linux).

- TR3: The system shall support integration with existing supermarket ERP systems.

6. Security Requirements

6.1 Data Protection

- SR1: The system shall ensure the protection of customer and transaction data through encryption and secure data storage.

6.2 Access Control

- SR2: The system shall implement role-based access control to restrict system access to authorized personnel only.

7. Implementation Requirements

7.1 Deployment

- IR1: The system shall support both on-premises and cloud deployment models.

7.2 Maintenance

- IR2: The system shall include features for regular maintenance, updates, and support.

8. Conclusion

The Supermarket Billing System is designed to enhance the efficiency and accuracy of the checkout process, improving the overall customer experience. By integrating multiple functionalities and supporting various payment methods, the system ensures seamless transactions and operational excellence. The requirements outlined in this document will guide the development and implementation of a robust and scalable billing solution for supermarkets.

3.2 HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements:

1. Point of Sale (POS) Terminals:

- Modern touchscreen terminals with high-resolution displays
- Minimum specifications: Intel i5 processor, 8GB RAM, 256GB SSD
- Barcode scanners integrated or standalone

2. Receipt Printers:

- Thermal receipt printers with high-speed printing capabilities

3. Cash Drawers:

- Secure and durable cash drawers with electronic opening mechanisms

4. Customer Display Screens:

- LCD or LED screens for displaying transaction details to customers

5. Networking Equipment:

- Reliable routers and switches for a robust network connection

- Ethernet cables or wireless connectivity options

6. Uninterruptible Power Supply (UPS):

- Backup power systems to ensure continuous operation during power outages

7. Payment Terminals:

- Card readers and NFC-enabled payment terminals for various payment gateways

8. Inventory Management Devices:

- Handheld barcode scanners or mobile devices with inventory management apps

Software Requirements:

1. Operating System:

- Windows 10 or higher / Linux distributions (depending on the POS terminal compatibility)

2. Database Management System (DBMS):

- MySQL, PostgreSQL, or SQLite for handling inventory and transaction data

3. Billing Software Application:

- Custom-developed or commercially available POS software tailored to supermarket needs

4. Payment Gateway Integration:

- APIs and SDKs for integrating with various payment gateways like PayPal, Stripe, Square, etc.

5. Inventory Management System:

- Software for real-time inventory tracking and management

6. Customer Relationship Management (CRM):

- CRM software for handling customer data and loyalty programs

7. Security Software:

- Antivirus and anti-malware solutions to protect the system from threats

- Firewall and network security software

8. Backup and Recovery Software:

- Solutions for regular data backups and recovery options in case of data loss

9. Compliance and Taxation Software:

- Tools to ensure compliance with local taxation and regulatory requirements

10. Data Analytics and Reporting Tools:

- Software for generating sales reports, customer behavior analytics, and other business insights

Additional Requirements:

Internet Connection:

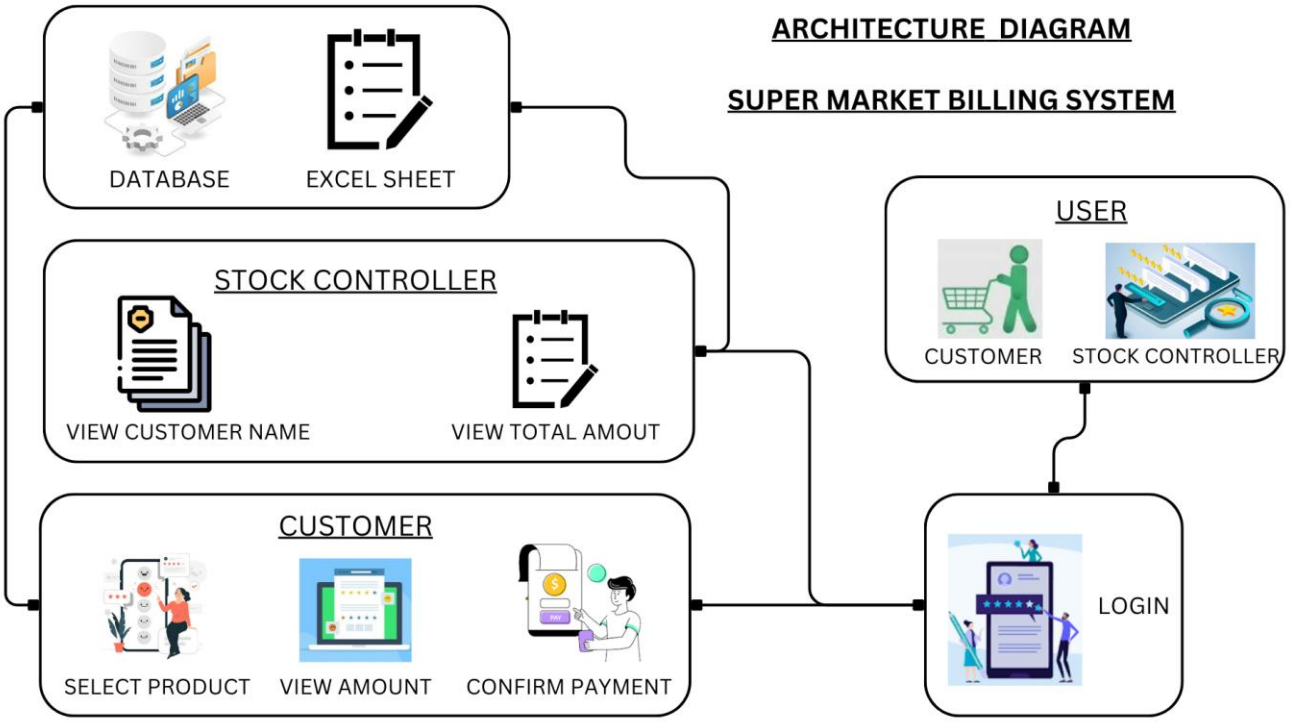
- High-speed internet for online payment processing and cloud-based functionalities

Technical Support:

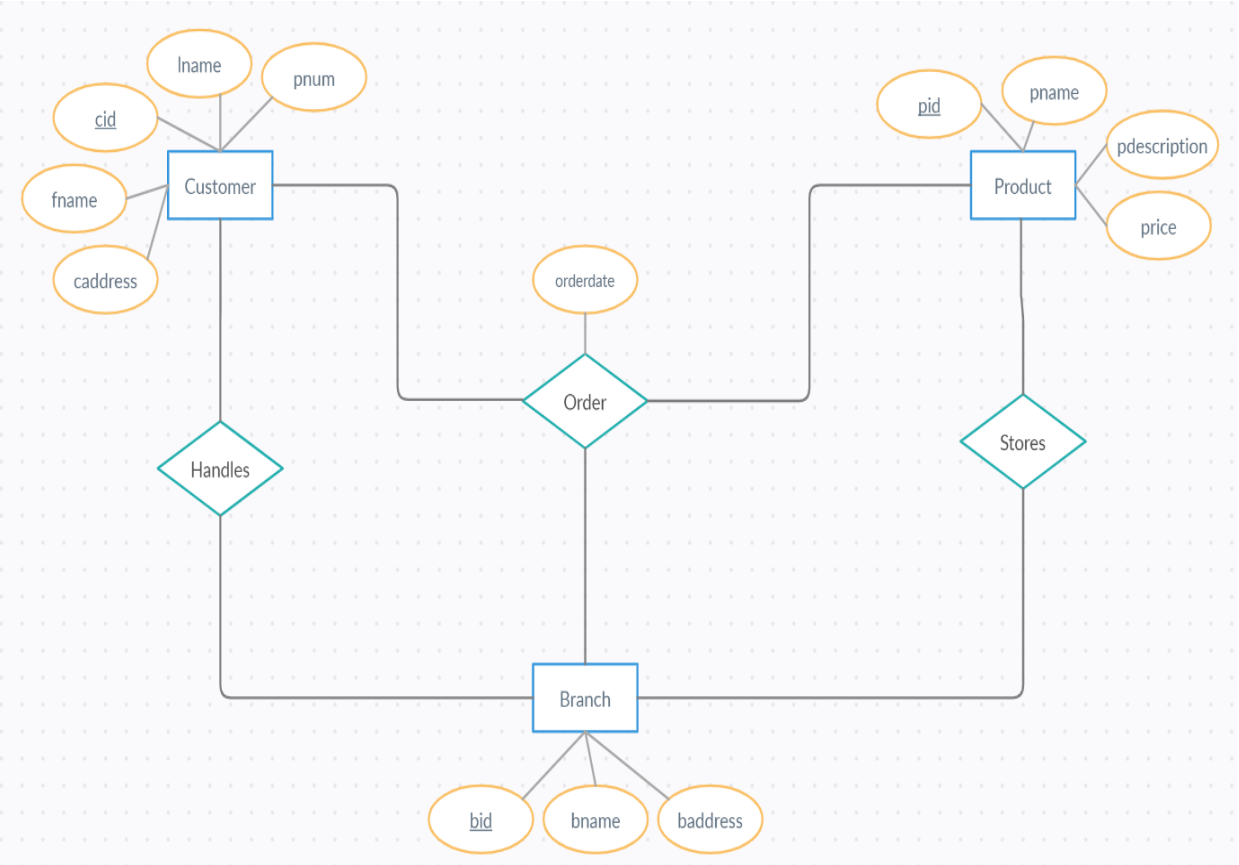
- Access to technical support and maintenance services to address any issues promptly

These hardware and software components ensure that the Supermarket Billing System operates efficiently, providing a seamless and reliable checkout experience for both customers and staff.

3.3 ARCHITECTURE DIAGRAM



3.4 ER DIAGRAM



3.5 NORMALIZATION

Supermarket Billing System

Objective: Streamline checkout process in retail environments.

Functionalities Integration: Enhances efficiency, accuracy, and customer satisfaction.

Key Features:

1. Product Quantity Selection: Allows customers to select product quantities.
2. Total Amount Display: System calculates and displays total amount.
3. Order Placement: Facilitates order placement upon confirmation.
4. Product Cancellation: Enables cancellation of products.
5. Payment Gateway Integrations: Supports various payment methods.

Benefits:

- Minimizes human error.
- Optimizes transaction speed.
- Ensures seamless shopping experience.

Scalability and Customization:

- Suitable for supermarkets of all sizes.
- Customizable to meet specific requirements.

Compliance:

- Supports taxation and regulatory requirements.

Significance:

- Represents a significant advancement in retail technology.
- Drives operational excellence.
- Improves overall business performance.

4. PROGRAM CODE

```
import customtkinter
from tkinter import *
from customtkinter import CTkImage
from tkinter import messagebox
from PIL import Image
import openpyxl as xl
from datetime import date
import mysql.connector

app = customtkinter.CTk()
app.geometry("800x450")
app.config(bg="#000000")
app.title("Supermarket")

img1 = CTkImage(Image.open(r'chocolate.png'), size=(100, 100))
img2 = CTkImage(Image.open(r'coke.png'), size=(100, 100))
img3 = CTkImage(Image.open(r'milk.png'), size=(100, 100))
img4 = CTkImage(Image.open(r'oill.png'), size=(100, 100))

font1 = ('arial', 15, 'bold')

Variable1 = IntVar()
Variable2 = IntVar()
Variable3 = IntVar()
Variable4 = IntVar()
Variable5 = 0
Variable6 = ''

price_list = [20, 10, 20, 30]

def get_db_connection():
    return mysql.connector.connect(
        host="localhost",
        user="root",
        password="ark2005$",
        database="bill_project"
    )

def cancel():
    Variable1.set(0)
    Variable2.set(0)
    Variable3.set(0)
    Variable4.set(0)

def pay():
    global Variable5, Variable6
    if name_entry.get() == '':
```

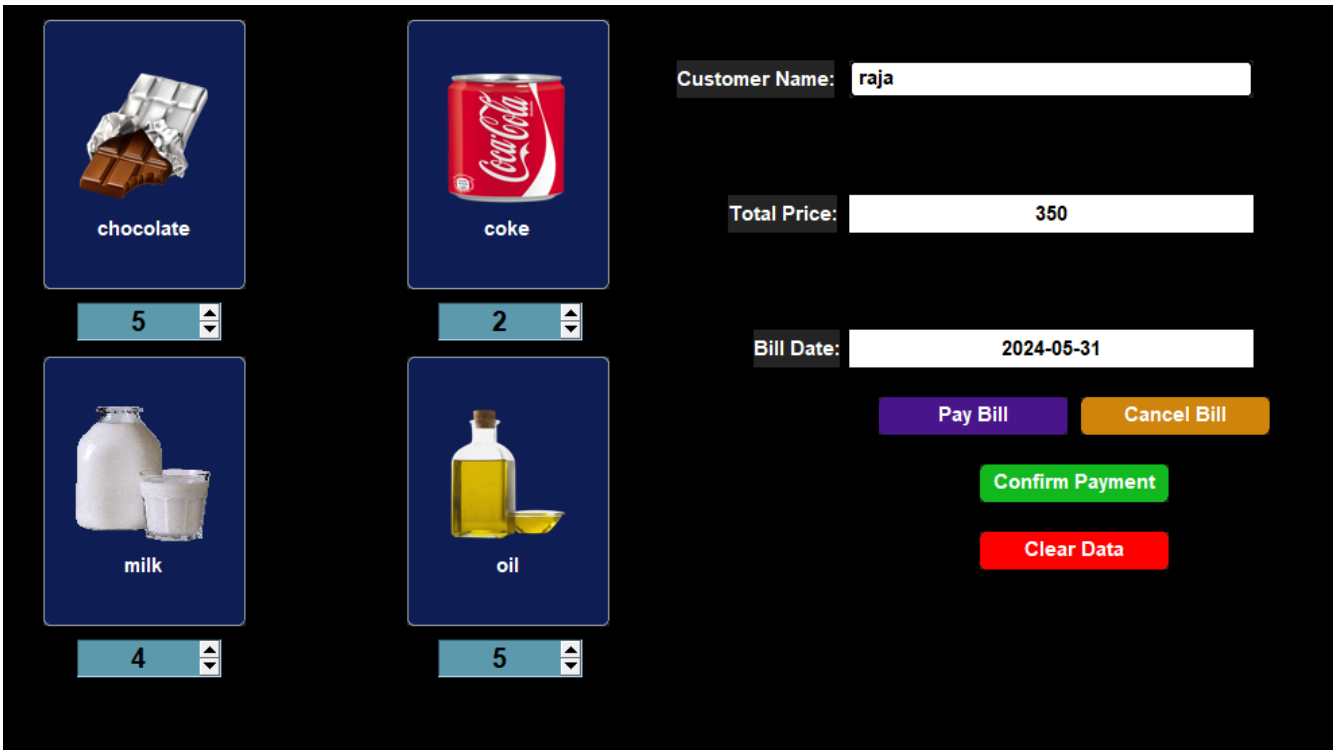
```
        messagebox.showerror(title="Error", message="Please enter your name")
    else:
        Variable5 = Variable1.get() * price_list[0] + Variable2.get() * price_list[1]
+ Variable3.get() * price_list[2] + Variable4.get() * price_list[3]

        total_label = customtkinter.CTkLabel(app, text=Variable5, font=font1,
text_color="#000000", fg_color="#FFFFFF", width=300)
        total_label.place(x=628, y=150)

        Variable6 = date.today()

        date_label = customtkinter.CTkLabel(app, text=Variable6, font=font1,
text_color="#000000", fg_color="#FFFFFF", width=300)
        date_label.place(x=628, y=250)

def confirm():
    global Variable5, Variable6
    file = xl.load_workbook('customers.xlsx')
    sheet = file["Sheet1"]
    sheet.cell(column=1, row=sheet.max_row + 1, value=name_entry.get())
    sheet.cell(column=2, row=sheet.max_row, value=Variable5)
    sheet.cell(column=3, row=sheet.max_row, value=Variable6)
    file.save('customers.xlsx')


    db = get_db_connection()
    cursor = db.cursor()
    sql = "INSERT INTO customers (name, total_price, bill_date) VALUES (%s, %s, %s)"
    values = (name_entry.get(), Variable5, Variable6)
    cursor.execute(sql, values)
    db.commit()
    cursor.close()
    db.close()

    messagebox.showinfo(title="Success", message="Data has been saved to Excel and
MySQL database")

def clear_data():
    db = get_db_connection()
    cursor = db.cursor()
    cursor.execute("TRUNCATE TABLE customers")
    db.commit()
    cursor.close()
    db.close()

    file = xl.load_workbook('customers.xlsx')
    sheet = file["Sheet1"]
    sheet.delete_rows(2, sheet.max_row)
    file.save('customers.xlsx')
```

```
    messagebox.showinfo(title="Success", message="All data has been cleared from MySQL
database and Excel file")

button1 = customtkinter.CTkButton(app, text="chocolate", font=font1,
fg_color="#0e1d54", hover_color="#0e1d54", text_color="#FFFFFF", border_width=1,
width=150, height=200, image=img1, compound=TOP)
button1.place(x=30, y=20)

button2 = customtkinter.CTkButton(app, text="coke", font=font1, fg_color="#0e1d54",
hover_color="#0e1d54", text_color="#FFFFFF", border_width=1, width=150, height=200,
image=img2, compound=TOP)
button2.place(x=300, y=20)

button3 = customtkinter.CTkButton(app, text="milk", font=font1, fg_color="#0e1d54",
hover_color="#0e1d54", text_color="#FFFFFF", border_width=1, width=150, height=200,
image=img3, compound=TOP)
button3.place(x=30, y=270)

button4 = customtkinter.CTkButton(app, text="oil", font=font1, fg_color="#0e1d54",
hover_color="#0e1d54", text_color="#FFFFFF", border_width=1, width=150, height=200,
image=img4, compound=TOP)
button4.place(x=300, y=270)

sp1 = Spinbox(app, from_=0, to=10, font=font1, width=8, background="#5c99ad",
justify=CENTER, textvariable=Variable1)
sp1.place(x=55, y=230)

sp2 = Spinbox(app, from_=0, to=10, font=font1, width=8, background="#5c99ad",
justify=CENTER, textvariable=Variable2)
sp2.place(x=323, y=230)

sp3 = Spinbox(app, from_=0, to=10, font=font1, width=8, background="#5c99ad",
justify=CENTER, textvariable=Variable3)
sp3.place(x=55, y=480)

sp4 = Spinbox(app, from_=0, to=10, font=font1, width=8, background="#5c99ad",
justify=CENTER, textvariable=Variable4)
sp4.place(x=323, y=480)

name_label = customtkinter.CTkLabel(app, text="Customer Name:", font=font1,
text_color="#FFFFFF")
name_label.place(x=500, y=50)

t_Price = customtkinter.CTkLabel(app, text="Total Price:", font=font1,
text_color="#FFFFFF")
t_Price.place(x=537.5, y=150)
```

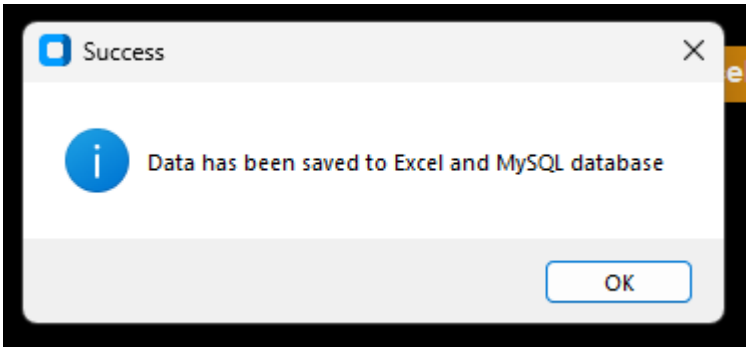
```
t_date = customtkinter.CTkLabel(app, text="Bill Date:", font=font1,
text_color="#FFFFFF")
t_date.place(x=557, y=250)

name_entry = customtkinter.CTkEntry(app, font=font1, text_color="#000000",
fg_color="#FFFFFF", border_color="#000000", width=300)
name_entry.place(x=628, y=50)

pay_button = customtkinter.CTkButton(app, command=pay, text="Pay Bill",
fg_color="#48158a", hover_color="#48158a", text_color="#FFFFFF", font=font1)
pay_button.place(x=650, y=300)

cancel_button = customtkinter.CTkButton(app, command=cancel, text="Cancel Bill",
fg_color="#cf840c", hover_color="#cf840c", text_color="#FFFFFF", font=font1)
cancel_button.place(x=800, y=300)

confirm_button = customtkinter.CTkButton(app, command=confirm, text="Confirm Payment",
fg_color="#11b81e", hover_color="#11b81e", text_color="#FFFFFF", font=font1)
confirm_button.place(x=725, y=350)

clear_button = customtkinter.CTkButton(app, command=clear_data, text="Clear Data",
fg_color="#ff0000", hover_color="#ff0000", text_color="#FFFFFF", font=font1)
clear_button.place(x=725, y=400)

app.mainloop()
```

5. RESULTS AND DISCUSSION

Output screen



Confirm payment



The data will be displayed in my SQL database

id	name	total_price	bill_date
1	raja	350.00	2024-05-31
NULL	NULL	NULL	NULL

The data will be displayed in the excel sheet

	A	B	C	D	E
1	id	name	total_price	bill_date	
2	1	raja	350	5/31/2024	
3	2	ranjith	500	4/25/2024	
4	3	rishi	250	5/14/2024	
5					

6. CONCLUSION

In conclusion, the Supermarket Billing System stands as a pinnacle of modern retail technology, revolutionizing the checkout process and elevating customer satisfaction. With its array of features including product quantity selection, real-time total display, order placement, and cancellation capabilities, coupled with seamless integration of various payment gateways, it ensures a smooth and efficient transaction experience. By reducing human error and optimizing transaction speed, this system not only enhances operational efficiency but also fosters a seamless shopping journey for customers. Moreover, its scalability and customizability make it adaptable to supermarkets of all sizes, while its compliance with taxation and regulatory requirements ensures legal adherence. Overall, the Supermarket Billing System represents a significant leap forward in retail technology, driving operational excellence, and ultimately contributing to the improvement of overall business performance in the retail sector.