Information Systems Capstone Project

System Name: Coffee Connect

Group Number: 3

Course Number:BIS698(22454983)

Course Name: Information Systems Project

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Introduction:

Java Junction is a mid-sized café with goals of increasing customer satisfaction and operational effectiveness. It is located in downtown Metropolis. Coffee Connect, the suggested solution, is an integrated information system designed to automate the ordering process, manage sales data, and provide insightful analytics for business decision-making. This project will focus on the development of a Desktop application for customers and an administrative dashboard for cafe management.

1. Background

Coffee Connect is a proposed information system designed for Java Junction; a mid-sized café located in downtown Metropolis. Java Junction has been serving customers for over five years and is known for offering seven distinct types of high-quality coffee. The café caters to a diverse customer base, including professionals, students, and casual coffee enthusiasts. With a team of 15 employees and a seating capacity for 50 customers, Java Junction operates daily from 7 AM to 9 PM, serving approximately 200 customers each day.

Java Junction seeks to enhance its customer experience and operational efficiency by implementing a digital solution that streamlines the ordering process, manages sales data, and provides insightful analytics to support business decisions.

2. Business Problems

Java Junction is currently facing several challenges that hinder its growth and efficiency:

2.1 Manual Order Management: Orders are taken manually, leading to potential errors, longer wait times, and decreased customer satisfaction during busy periods.

2.2 Limited Sales Tracking: The café lacks a comprehensive system to accurately track daily, monthly, and yearly sales data, making it difficult to identify trends and make informed decisions. Inventory Management Issues: Managing inventory levels is challenging without precise sales data, resulting in either overstocking or running out of popular coffee types.

2.3 Customer Experience Gaps: The absence of a digital ordering platform limits convenience for customers who prefer using mobile devices for transactions.

2.4 Lack of Data-Driven Insights: Limited access to detailed sales analytics hampers the café's ability to address declining sales in specific areas and capitalize on growth opportunities. Addressing these issues presents an opportunity to improve operational efficiency, enhance customer satisfaction, and drive business growth through data-driven strategies.

3. Project Description

Coffee Connect is an integrated information system that includes a desktop application for customers and an administrative dashboard for café management. The system aims to automate the ordering process, provide comprehensive sales analytics, and support inventory management.

3.1 Functional Requirements:

Customer Module:

- **Browse Menu:** Display seven types of coffee with options for size (small, medium, large) and customization (e.g., extra shot, milk type).
- **Order Placement:** Allow customers to select their desired coffee, customize their order, and add it to the cart.
- **Checkout Process:** Facilitate secure payment through the app with various payment methods. Order Tracking: Enable customers to view the status of their orders (e.g., received, preparing, ready for pickup).

Admin Module:

- **User Authentication:** Secure login for administrators using a user ID and password.
- **Order Management:** View, accept, and update the status of incoming orders.
- **Sales Analytics:** Access detailed reports on daily, monthly, and yearly sales, including profit margins for each coffee type.
- **Peak Sales Insights:** Identify which coffees are most popular during morning and evening hours and much more.

Project Scope:

Included:
Development of the Coffee Connect Desktop application using Python.
Implementation of a MySQL database for managing sales and order data.
Development of sales tracking and analytics features.
User-friendly interface design for both customer and admin modules.

Excluded:
Physical hardware upgrades at the cafe.
Integration with third-party inventory management systems beyond basic sales data tracking.
Advanced customization options beyond size and basic customization features.

4. Project Feasibility

4.1 Economic Feasibility:

Estimated Costs: Development costs are projected at $12,000, covering software development, testing, and deployment.
Budget Considerations: Java Junction has allocated $15,000 for the project, ensuring adequate funds for any unexpected expenses.
Financial Benefits: An anticipated 15% increase in sales within the first year due to streamlined operations and enhanced customer experience. Additionally, reducing order errors is expected to save approximately $4,000 annually.

4.2 Technical Feasibility:

Technologies Used: The Desktop application will be developed using Python, Tkinter for development, and MySQL for database management.
Technical Requirements: Reliable internet connectivity and secure payment gateway integration.
Potential Challenges: Ensuring data security, especially for payment information, and maintaining system uptime during peak hours. These challenges will be addressed through robust security measures.

4.3 Schedule Feasibility:

Project Timeline: The project is scheduled to be completed within six months, with key milestones as follows:
1 Week: Initiation & Requirements gathering phase
4 Weeks: Design phase
3 Weeks: System Development Phase
2 Weeks: Testing phase
3 weeks: Deployment Phase
Key Milestones: Completion of the prototype by the end of week 5, beta testing in week 9, and full deployment by the end of week 13.

4.4 Operational Feasibility:

- **Integration with Current Operations:** Coffee Connect will integrate seamlessly with existing point-of-sale systems, minimizing disruption to daily operations.
- **User Acceptance:** The user-friendly interface is designed for easy navigation, requiring minimal training for both customers and staff, ensuring quick adoption.

- **Training Requirements:** Comprehensive training sessions will be conducted for café staff to familiarize them with the admin module and order management processes.

5. Process Model:

According to the requirements of our project. We have chosen the waterfall model to best suit this due to its well-defined requirements and sequential tasks to be done. The main features include the following they are:

- Initiation & Requirement Gathering phase.
- Design Phase
- System development phase.
- Testing phase
- Deployment phase.

6. Data Flow Diagram

6.1 Context-Level Data Flow Diagram

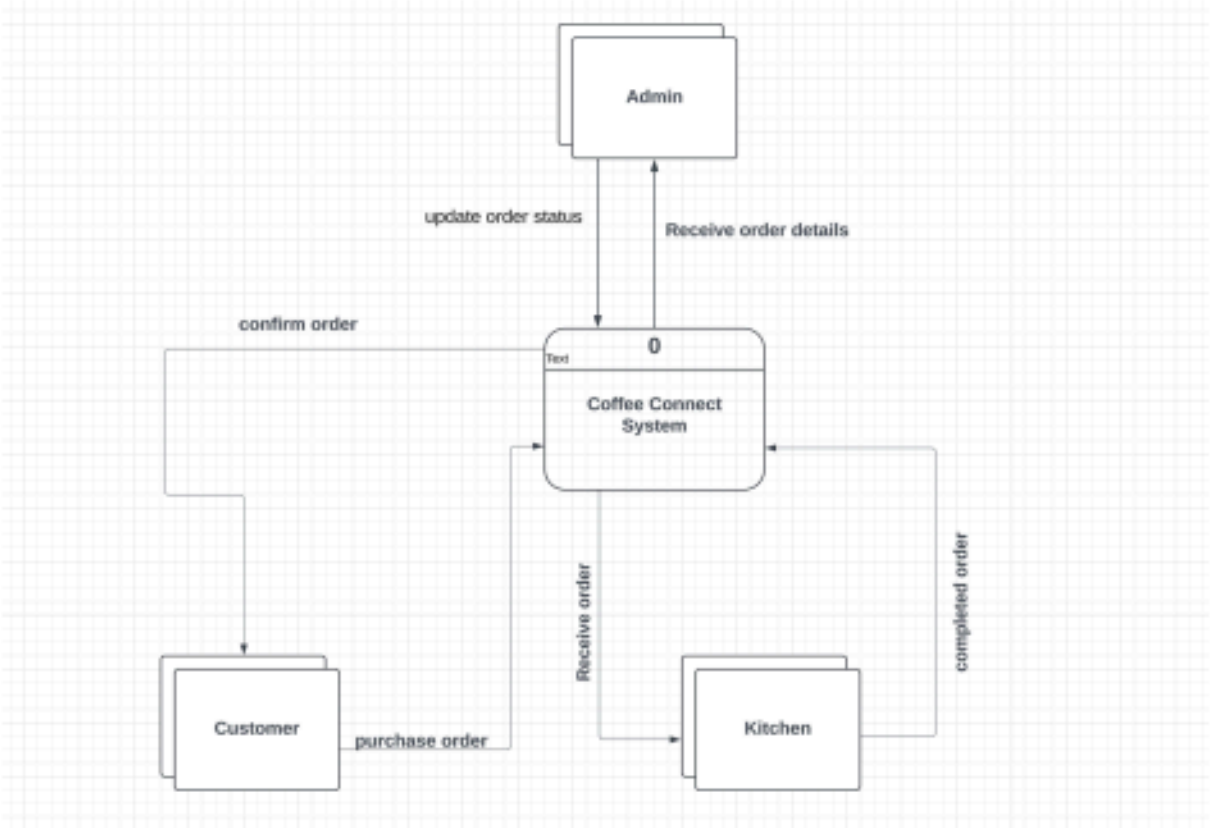


Figure-3.1 The image shows a context diagram for a Coffee Connect System, illustrating data flows between the system and external entities including Admin, Customer, Kitchen, and Payment System.

6.2. Level-0 Data Flow Diagram

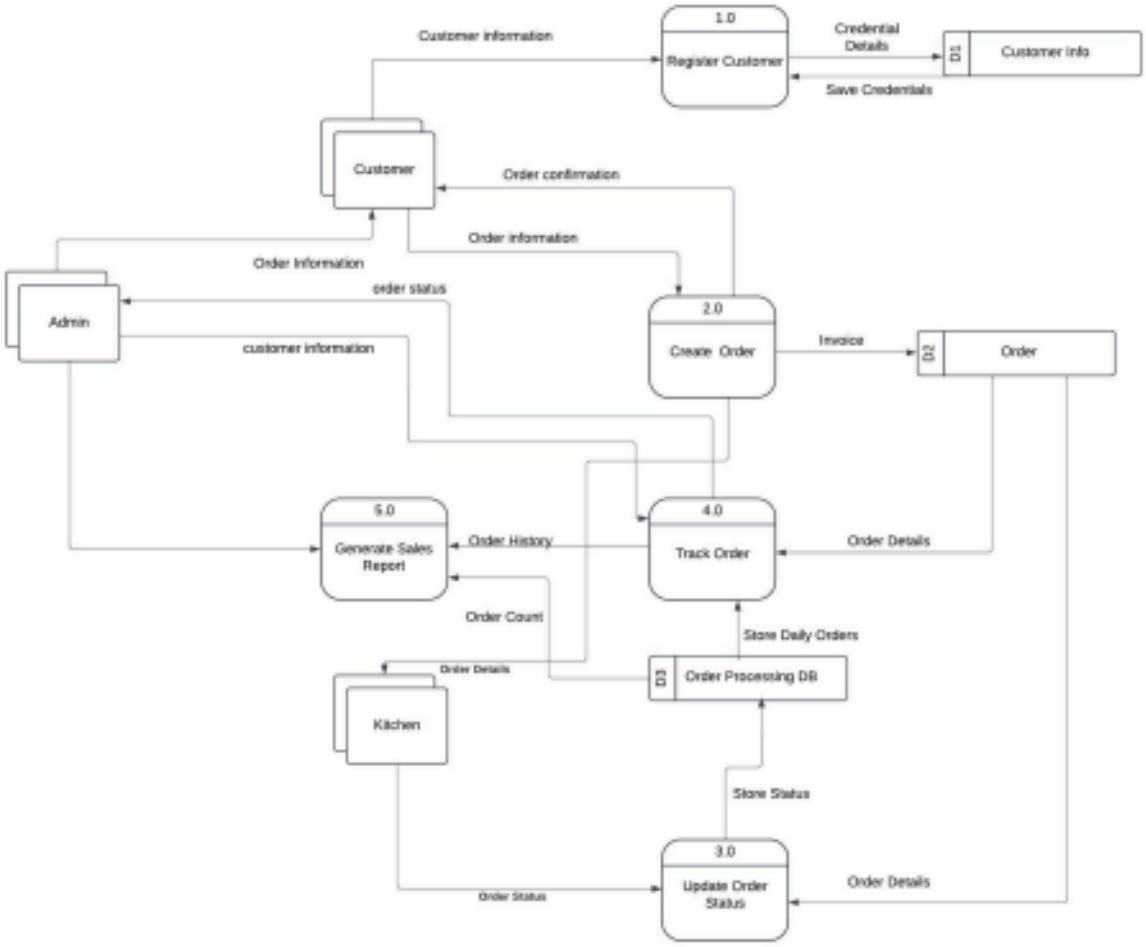


Figure-3.2 Level-0 DFD of a coffee ordering system showing customer, kitchen, admin interactions with core services.

7. Use-Cases and Description

7.1 Use Case Table: Place a Coffee Order

Use Case Name	Place a Coffee Order
ID	UC-1

Priority	High
Actor	Customer
Description	The customer selects a coffee type, customizes the order (size, flavor, etc.), and places the order.
Trigger	The customer wants to place a coffee order through the app
Type	External
Preconditions	1. The customer is authenticated by logging into their account. 2. The system is online and ready to accept orders.
Normal Course	1. The customer selects the type of coffee from a menu. 2. The customer customizes the coffee (size, flavor, etc.). 3. The system displays the total cost of the order. 4. The customer confirms the necessary selections. 5. The system sends the coffee preparation details to the kitchen. 6. The system generates a confirmation and displays it to the customer. 7. The system stores the necessary details in the database. 8. The system updates the status to "In Progress."
Postconditions	1. The necessary information is stored in the database. 2. The status is updated to "In Progress." 3. The customer receives a confirmation

7.2. Use Case Table: Register Customer

Use Case Name	Register Customer
ID	UC-2
Priority	High

Actor	Customer
Description	A new customer registers their details to create an account in the system
Trigger	The customer decides to sign up to use the coffee ordering application
Type	External
Preconditions	1. The system is online. 2. The customer provides valid personal and account details.
Normal Course	1. The customer navigates to the "Register" page. 2. The system prompts the customer to enter personal details (name, email, password, etc.). 3. The system validates the entered details. 4. The system stores the necessary details in the database. 5. The system notifies the customer of successful registration.
Postconditions	1. The customer is registered in the system. 2. The system creates a user account in the database

7.3. Use Case Table: View Order Status

Use Case Name	View Order Status
ID	UC-3
Priority	Medium
Actor	Customer
Description	The customer views the status of their coffee order (e.g., "In Progress," "Completed").
Trigger	The customer wants to check the status of their placed coffee order
Type	External
Preconditions	1. The customer has placed an order. 2. The status is available in the system
Normal Course	1. The customer navigates to the "My

	Orders" section. 2. The system retrieves the necessary details from the database. 3. The system displays the status of the customer's coffee preparation
Postconditions	The customer views the updated status

7.4. Use Case Table: Update Status (Admin)

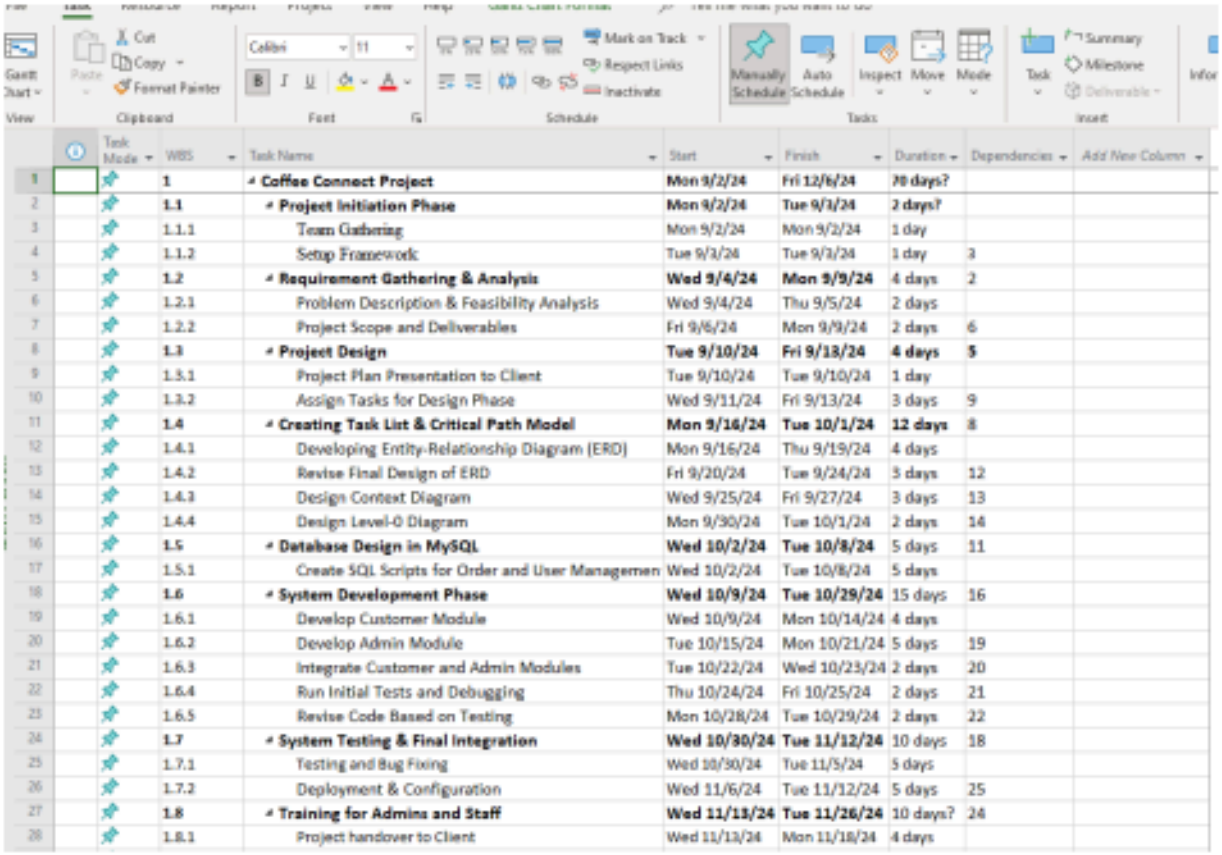
Use Case Name	Update Order Status
ID	UC-4
Priority	High
Actor	Admin
Description	The admin updates the status of a coffee order (e.g., "In Progress," "Completed").
Trigger	The admin wants to update the status of an order after processing
Type	Internal
Preconditions	1. The order is currently being processed by the kitchen. 2. The admin is authenticated to perform the action
Normal Course	1. The admin selects the relevant record from the list of pending orders. 2. The system retrieves the necessary details. 3. The admin selects the new status (e.g., "Completed"). 4. The system updates the status in the database. 5. The system notifies the customer of the status change
Postconditions	1. The status is updated in the database. 2. The customer is notified of the status change.

7.5. Use Case Table: Generate Sales Report

Use Case Name	Generate Sales Report
ID	UC-5
Priority	Medium
Actor	Admin
Description	The admin generates sales reports to review the performance and revenue of the coffee shop.
Trigger	The admin wants to view or download the sales report
Type	Internal
Preconditions	1. The admin is authenticated and has the necessary permissions. 2. There are completed records in the system to generate the report
Normal Course	1. The admin navigates to the "Reports" section. 2. The system displays options to filter the data (e.g., by date range, product type). 3. The admin selects the desired filters and clicks on "Generate Report." 4. The system processes the request and generates a report. 5. The admin can view the report online or download it as an Excel file.
Postconditions	1. The sales report is generated and available for viewing or download. 2. The admin can use the report to analyze sales trends and performance

8. Task List for Coffee Connect Project (Sep 2024 - Dec 2024)

1. Coffee Connect Project
1.1 Project Initiation phase
1.1.1 Team Gathering
1.1.2 Setup Framework
1.2 Requirement Gathering & Analysis
1.2.1 Problem Description& Feasibility Analysis
1.2.2 Project Scope and Deliverables
1.3 Project Design
1.3.1 Project plan presentation to client
1.3.2 Assign Tasks for design phase
1.4 Creating Task List & Critical Path Model
1.4.1 Developing Entity-Relationship Diagram(ERD)
1.4.2 Revie Final Design OF ERD
1.4.3 Design Context Diagram
1.4.4 Design Level 0 Diagram
1.5 Database Design in MySQL
1.5.1 Create SQL Scripts for Order and User Management
1.6 System Development Phase
1.6.1 Develop Customer Module
1.6.2 Develop Admin Module
1.6.3 Integrate Customer and Admin Modules
1.6.4 Run Initial Tests and Debugging
1.6.5 Revise Code Based on Testing
1.7 System Testing & Final Integration
1.7.1 Testing and Bug fixing
1.7.2 Deployment & Configuration
1.8 Training for Admin and Staff
1.8.1 Project handover to Client
1.8.2 Final Testing & User Acceptance
1.9 Project Closing & Documentation
1.9.1 Presentation Preparation
1.9.2 Final Project Presentation.



	Task Mode	WBS	Task Name	Start	Finish	Duration	Dependencies	Add New Column
1		1	**Coffee Connect Project**	**Mon 9/2/24**	**Fri 12/6/24**	**70 days?**		
2		1.1	**Project Initiation Phase**	**Mon 9/2/24**	**Tue 9/3/24**	**2 days?**		
3		1.1.1	Team Gathering	Mon 9/2/24	Mon 9/2/24	1 day		
4		1.1.2	Setup Framework	Tue 9/3/24	Tue 9/3/24	1 day	3	
5		1.2	**Requirement Gathering & Analysis**	**Wed 9/4/24**	**Mon 9/9/24**	4 days	2	
6		1.2.1	Problem Description & Feasibility Analysis	Wed 9/4/24	Thu 9/5/24	2 days		
7		1.2.2	Project Scope and Deliverables	Fri 9/6/24	Mon 9/9/24	2 days	6	
8		1.3	**Project Design**	**Tue 9/10/24**	**Fri 9/13/24**	**4 days**	**5**	
9		1.3.1	Project Plan Presentation to Client	Tue 9/10/24	Tue 9/10/24	1 day		
10		1.3.2	Assign Tasks for Design Phase	Wed 9/11/24	Fri 9/13/24	3 days	9	
11		1.4	**Creating Task List & Critical Path Model**	**Mon 9/16/24**	**Tue 10/1/24**	**12 days**	8	
12		1.4.1	Developing Entity-Relationship Diagram (ERD)	Mon 9/16/24	Thu 9/19/24	4 days		
13		1.4.2	Revise Final Design of ERD	Fri 9/20/24	Tue 9/24/24	3 days	12	
14		1.4.3	Design Context Diagram	Wed 9/25/24	Fri 9/27/24	3 days	13	
15		1.4.4	Design Level-0 Diagram	Mon 9/30/24	Tue 10/1/24	2 days	14	
16		1.5	**Database Design in MySQL**	**Wed 10/2/24**	**Tue 10/8/24**	5 days	11	
17		1.5.1	Create SQL Scripts for Order and User Managemen	Wed 10/2/24	Tue 10/8/24	5 days		
18		1.6	**System Development Phase**	**Wed 10/9/24**	**Tue 10/29/24**	15 days	16	
19		1.6.1	Develop Customer Module	Wed 10/9/24	Mon 10/14/24	4 days		
20		1.6.2	Develop Admin Module	Tue 10/15/24	Mon 10/21/24	5 days	19	
21		1.6.3	Integrate Customer and Admin Modules	Tue 10/22/24	Wed 10/23/24	2 days	20	
22		1.6.4	Run Initial Tests and Debugging	Thu 10/24/24	Fri 10/25/24	2 days	21	
23		1.6.5	Revise Code Based on Testing	Mon 10/28/24	Tue 10/29/24	2 days	22	
24		1.7	**System Testing & Final Integration**	**Wed 10/30/24**	**Tue 11/12/24**	10 days	18	
25		1.7.1	Testing and Bug Fixing	Wed 10/30/24	Tue 11/5/24	5 days		
26		1.7.2	Deployment & Configuration	Wed 11/6/24	Tue 11/12/24	5 days	25	
27		1.8	**Training for Admins and Staff**	**Wed 11/13/24**	**Tue 11/26/24**	10 days?	24	
28		1.8.1	Project handover to Client	Wed 11/13/24	Mon 11/18/24	4 days		

9. Project Schedule

Task	Duration	Start date	End Date
Initiation & Requirement Gathering Phase	1 weeks	Day1	Day 6
Design Phase	4 weeks	Day 7	Day 27
System development Phase	3 weeks	Day 28	Day 46
Testing Phase	2 weeks	Day 43	Day 52
Deployment Phase	3 weeks	Day 53	Day 70

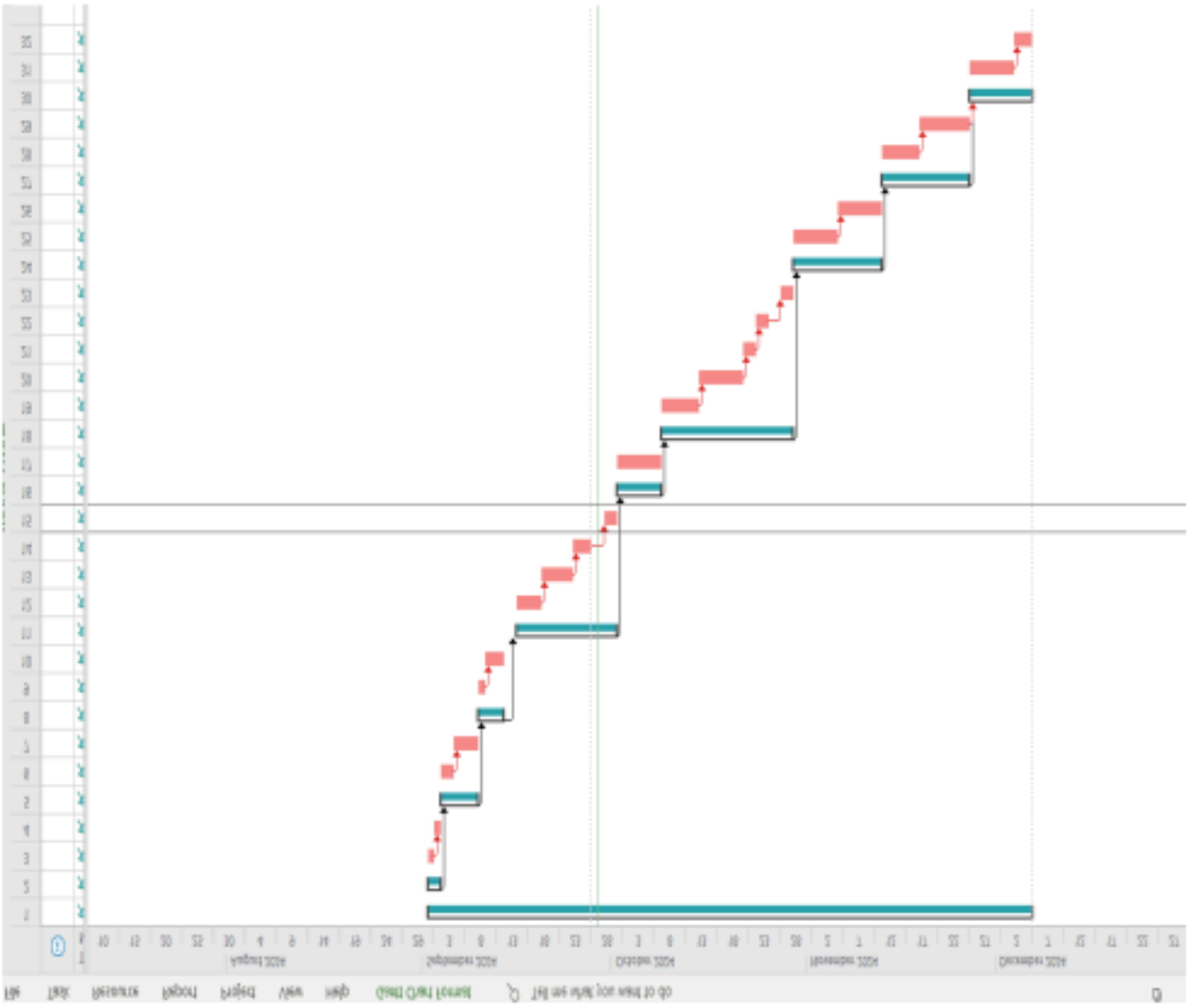
Table 6.1 The table describes the timeline of each stage of the software development life cycle.

10. Critical Path for Coffee Connect Project

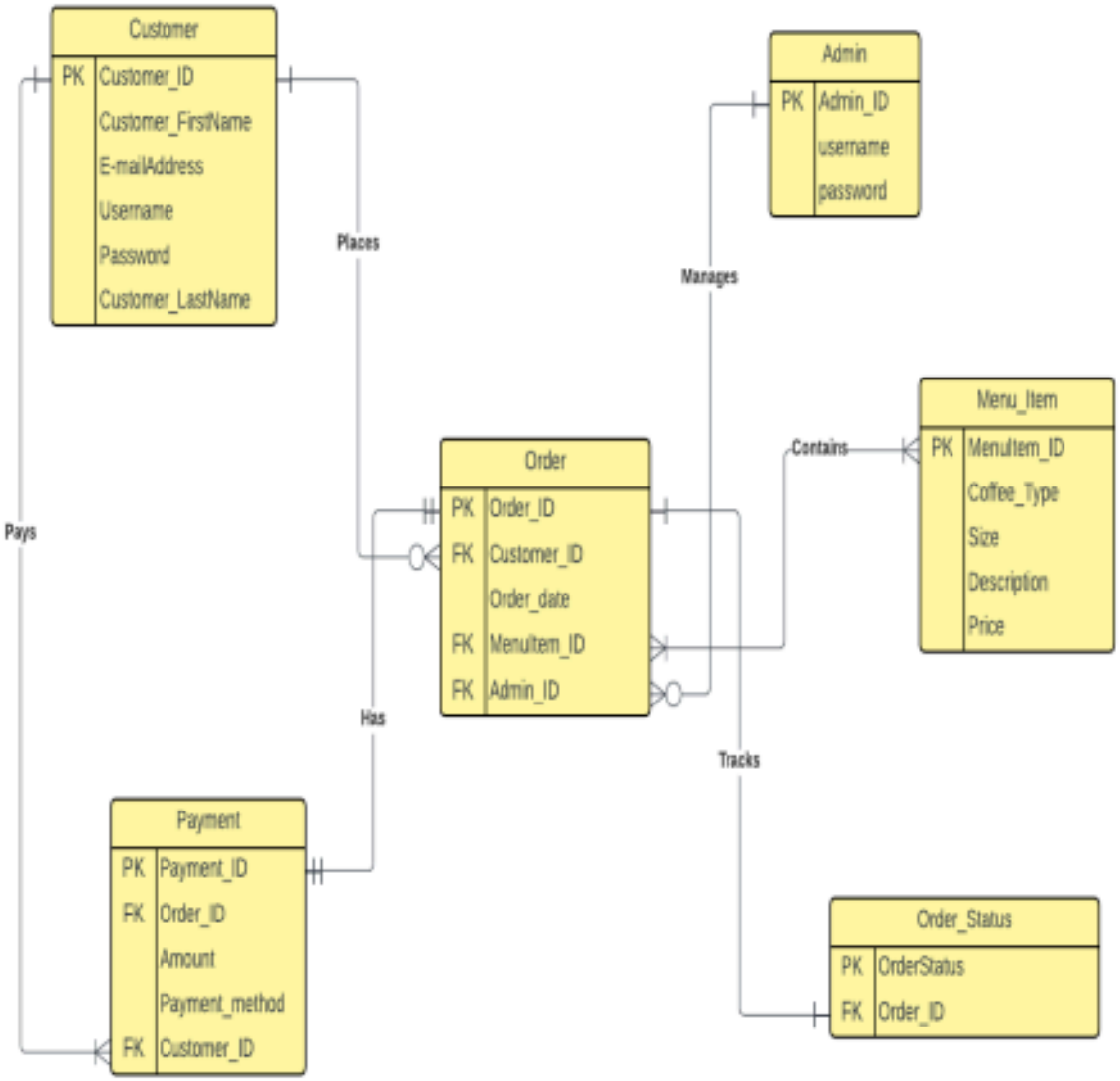
Critical path is a project management concept that tells the sequence of longest tasks that must be done without any disturbance(delay in a task ultimately results to failure of the

project as it is dependent on one task to another task) which helps the project in successful. This includes features such as the longest duration, zero slack, and dependencies.

- Initiation & Requirement Gathering phase(1 week)
- Design Phase (4 weeks)
- System Development Phase (3 weeks)
- Testing phase (2 weeks)
- Deployment phase. (3 weeks).



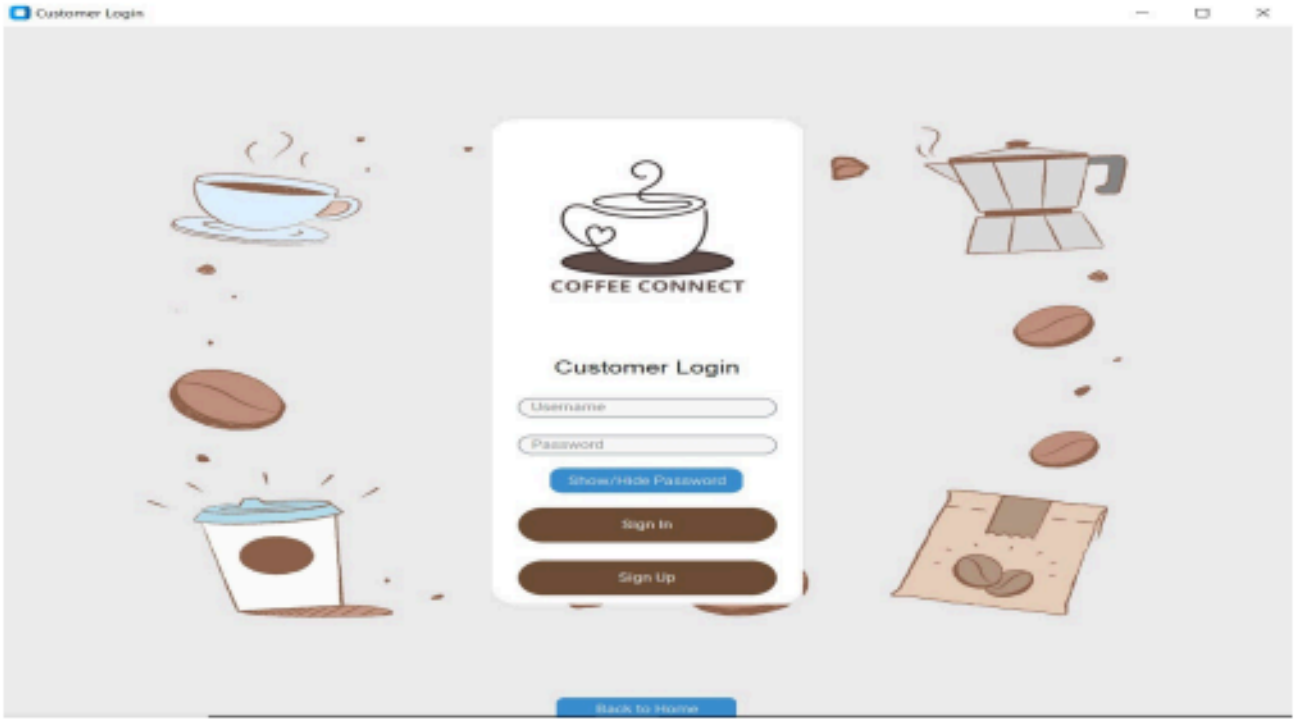
11. ERD


Customer
PK Customer_ID
Customer_FirstName
E-mailAddress
Username
Password
Customer_LastName
Admin
PK Admin_ID
username
password
Places
Manages
Menu_Item
PK MenuItem_ID
Coffee_Type
Size
Description
Price
Contains
Order
PK Order_ID
FK Customer_ID
Order_date
FK MenuItem_ID
FK Admin_ID
Pays
Has
Tracks
Payment
PK Payment_ID
FK Order_ID
Amount
Payment_method
FK Customer_ID
Order_Status
PK OrderStatus
FK Order_ID

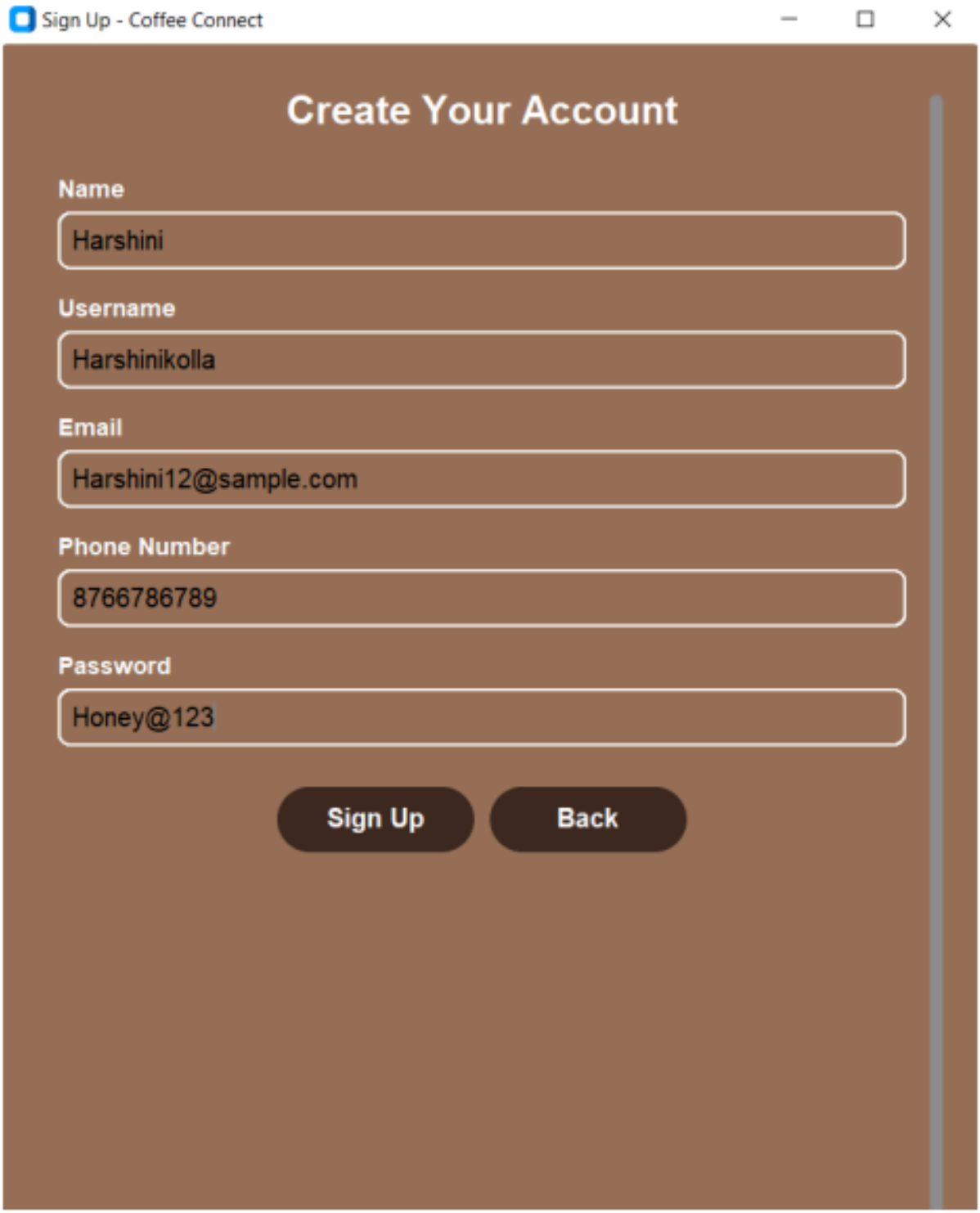
12. Screens

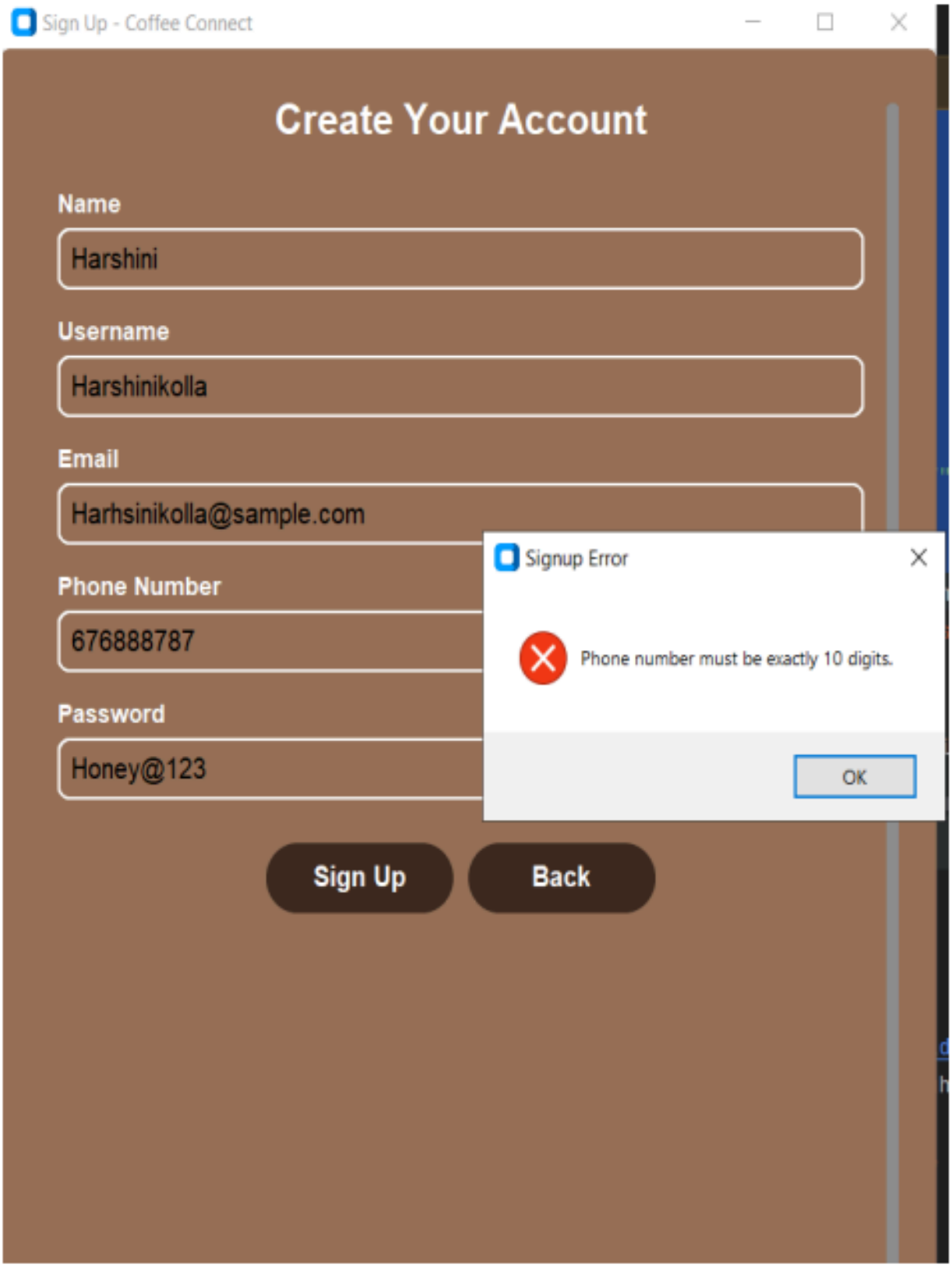
12.1 Home Screen:

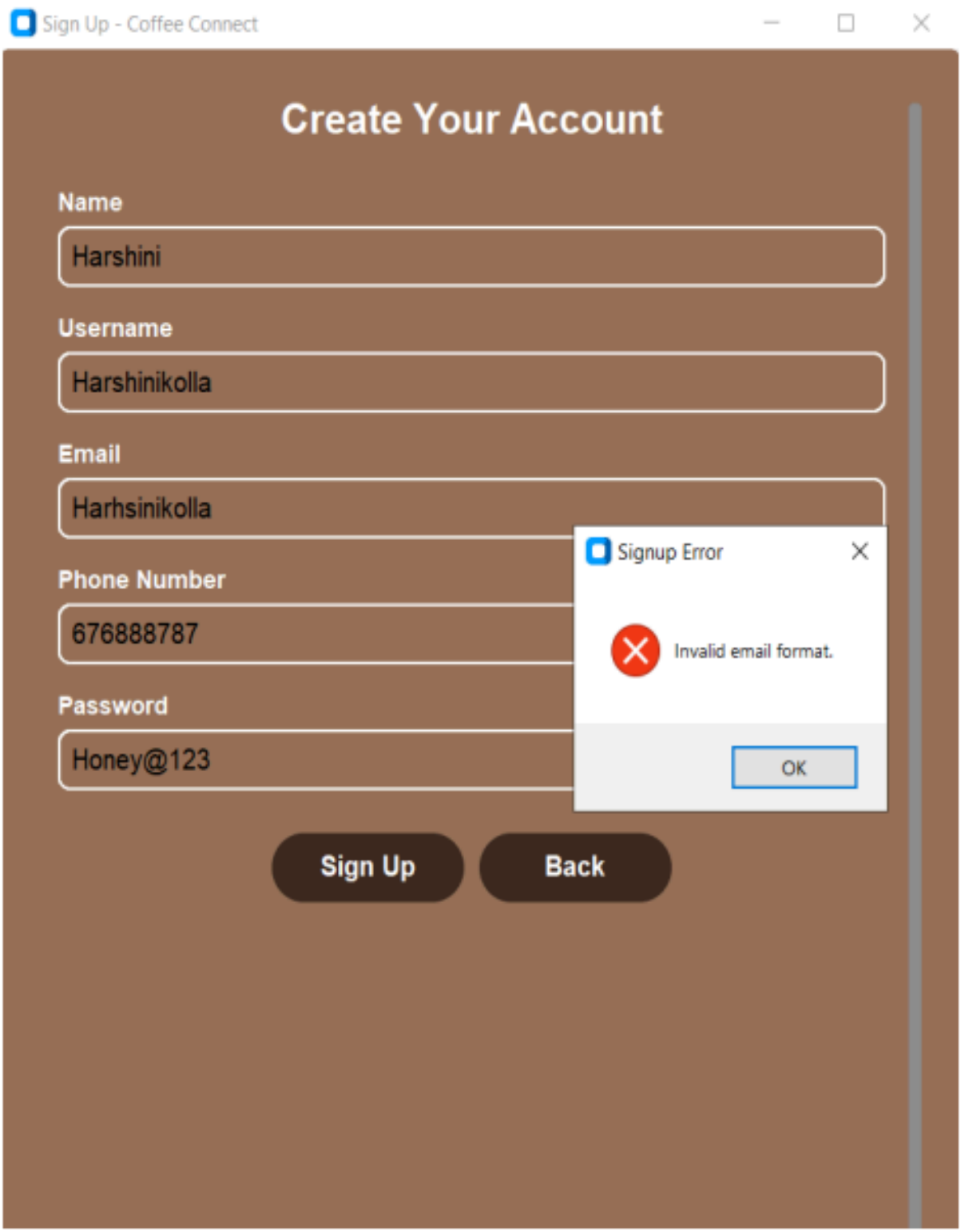
12.2 Customer Login Screen:



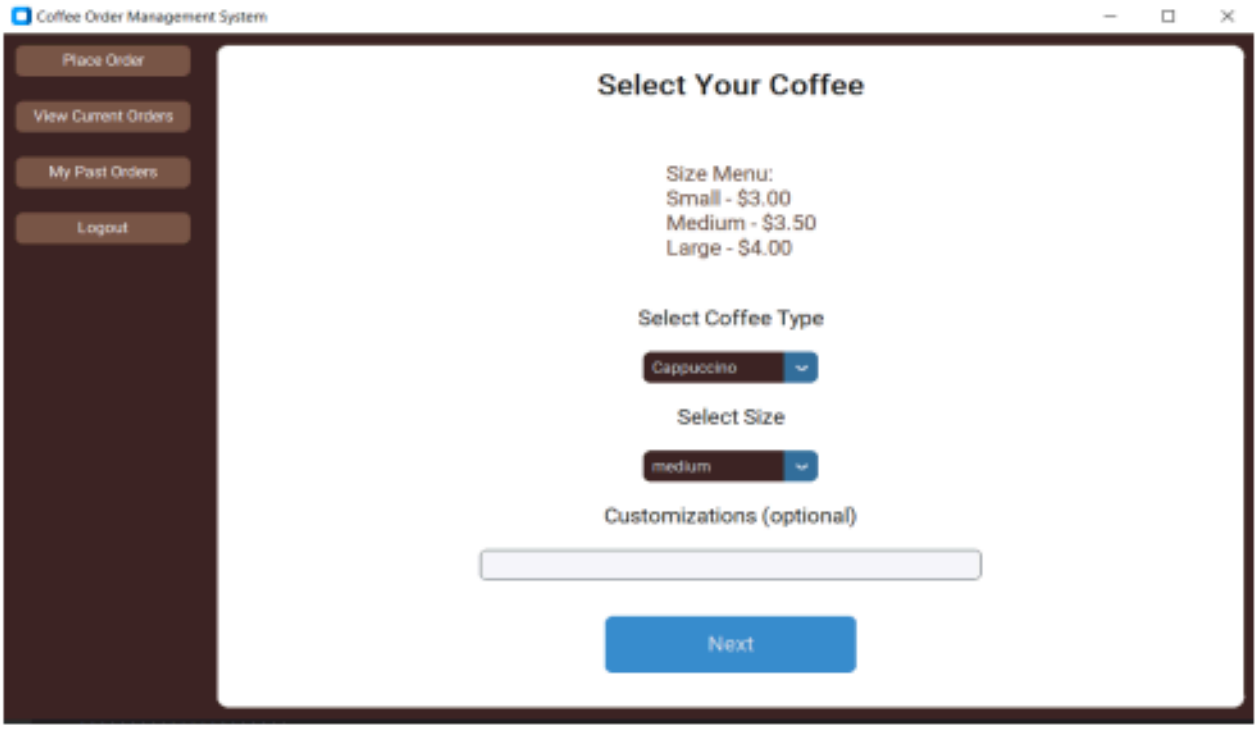
12.3 Sign Up Screen:



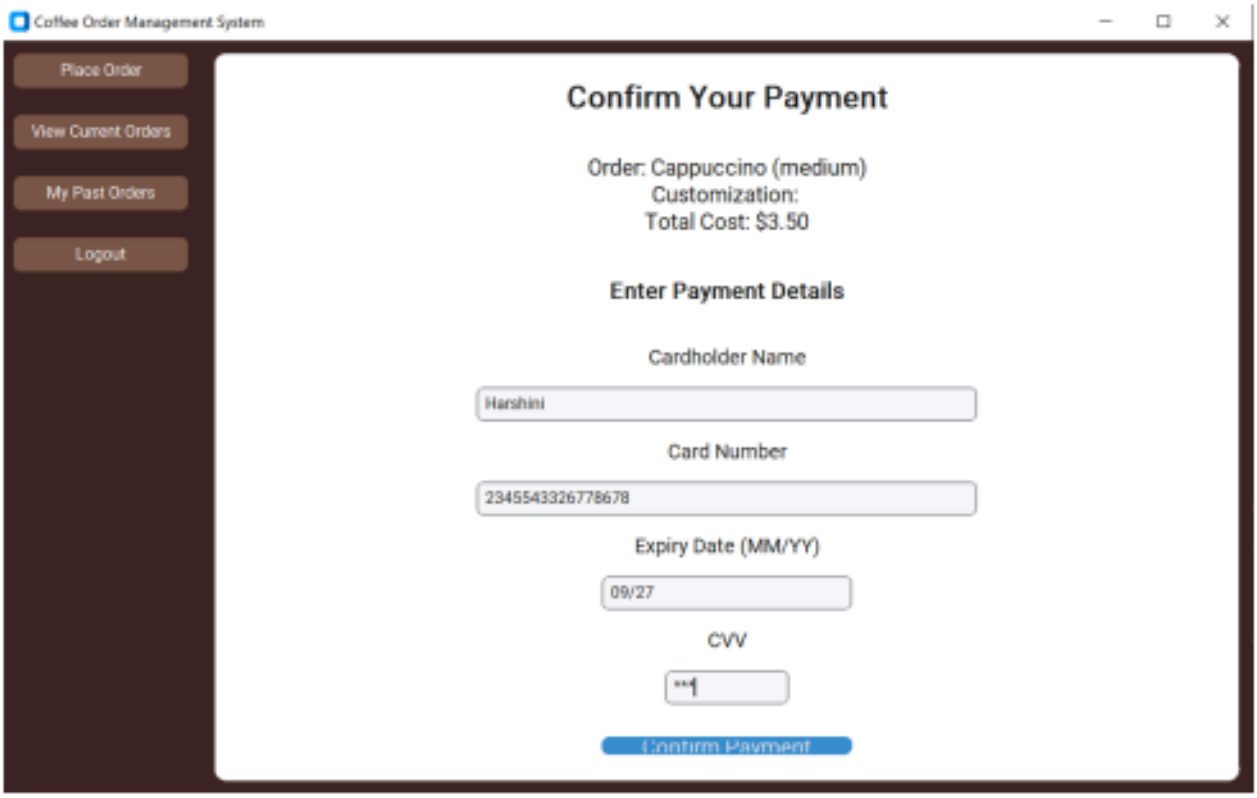

Sign Up - Coffee Connect
Create Your Account
Name
Harshini
Username
Harshinikolla
Email
Harhsinikolla@sample.com
Phone Number
676888787
Password
Honey@123
Sign Up
Back
Signup Error
Phone number must be exactly 10 digits.
OK


Sign Up - Coffee Connect
Create Your Account
Name
Harshini
Username
Harshinikolla
Email
Harhsinikolla
Phone Number
676888787
Password
Honey@123
Signup Error
Invalid email format.
OK
Sign Up
Back

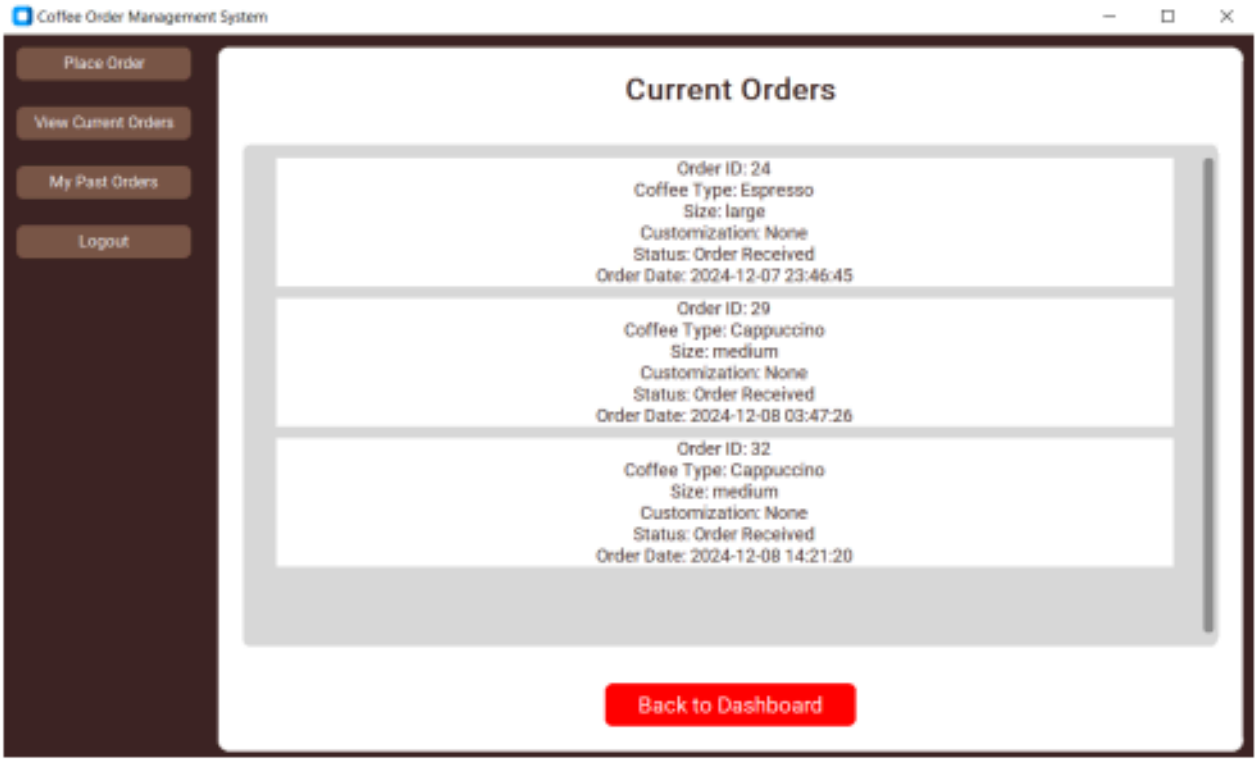
12.4 Place Order Screen:



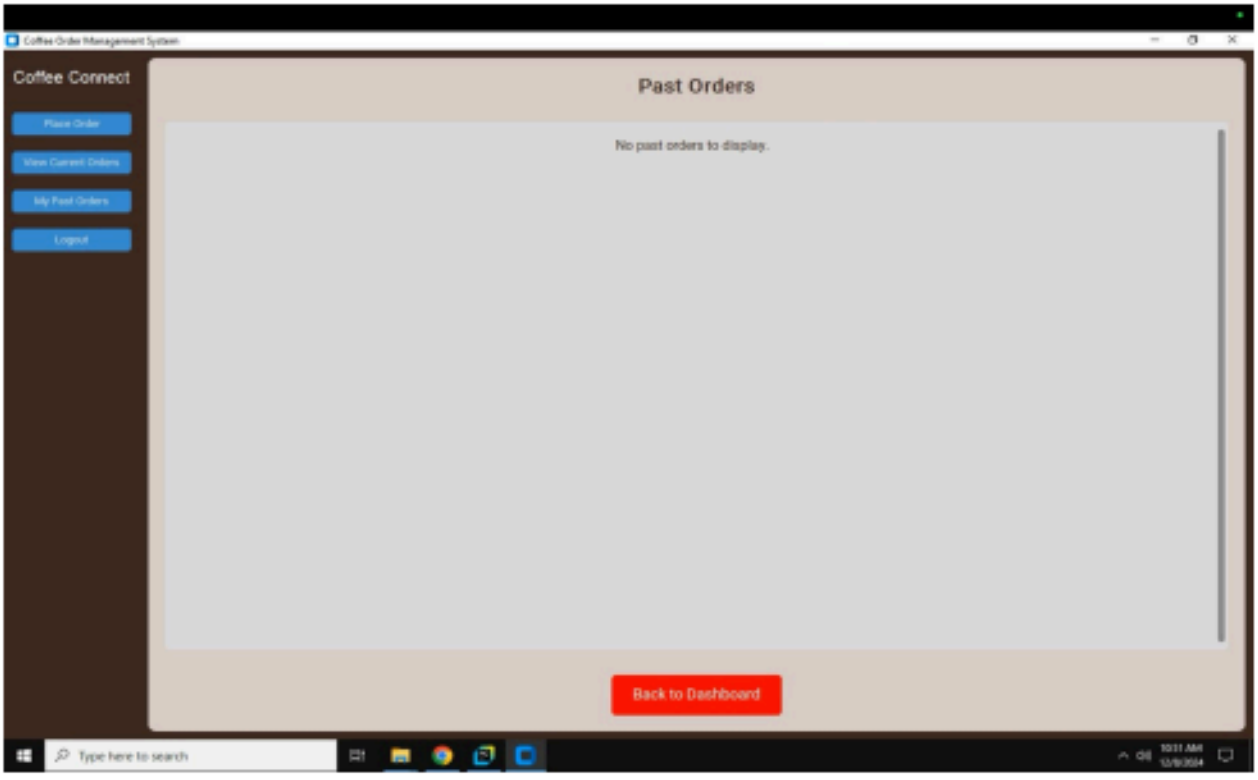
12.5 Payment Screen:



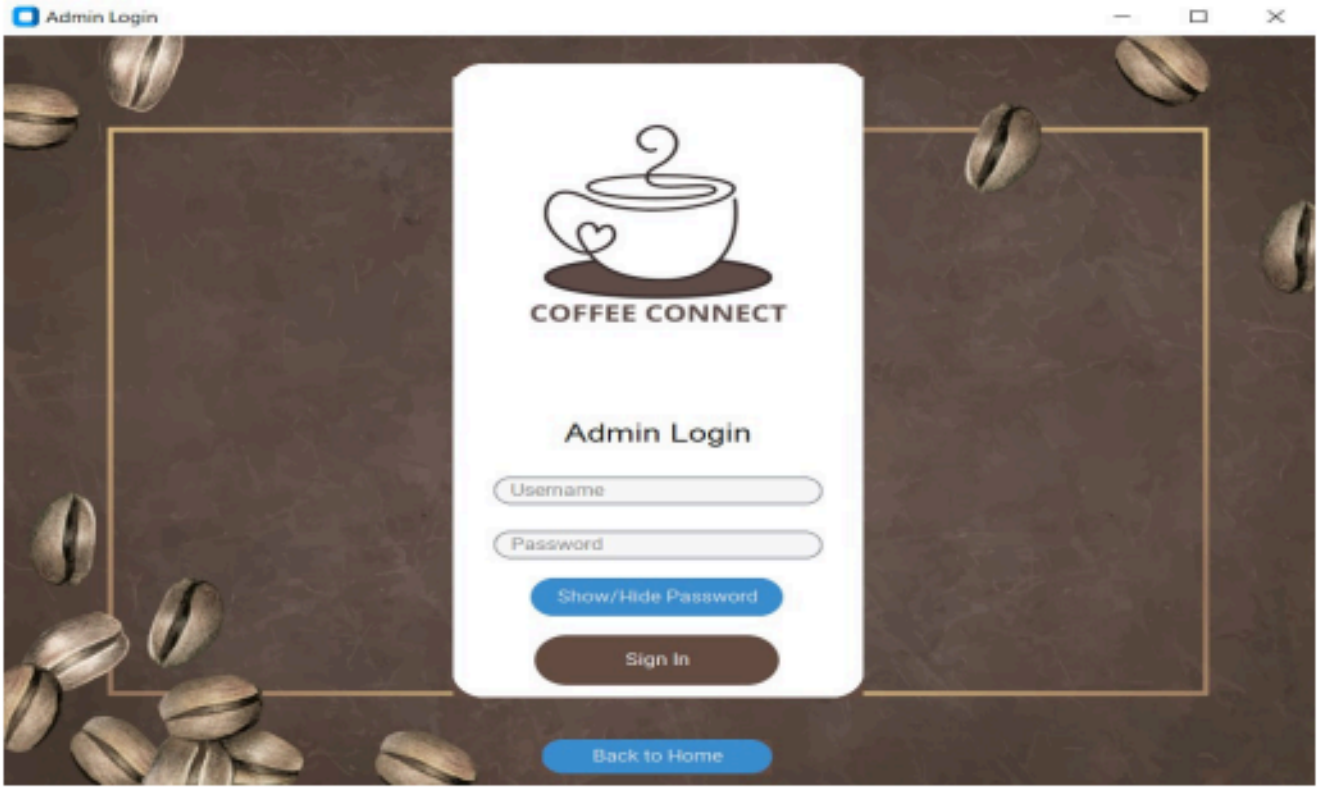
12.6 Current Orders Screen:



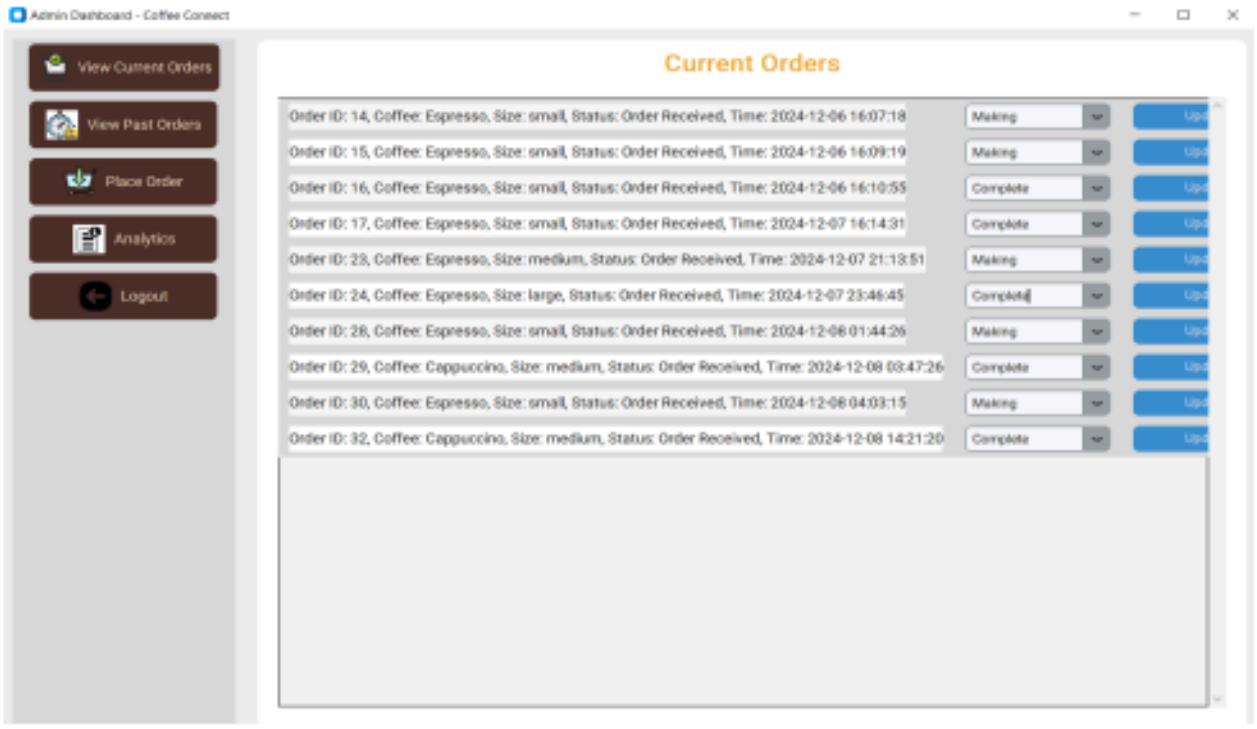
12.7 Past Orders Screen:



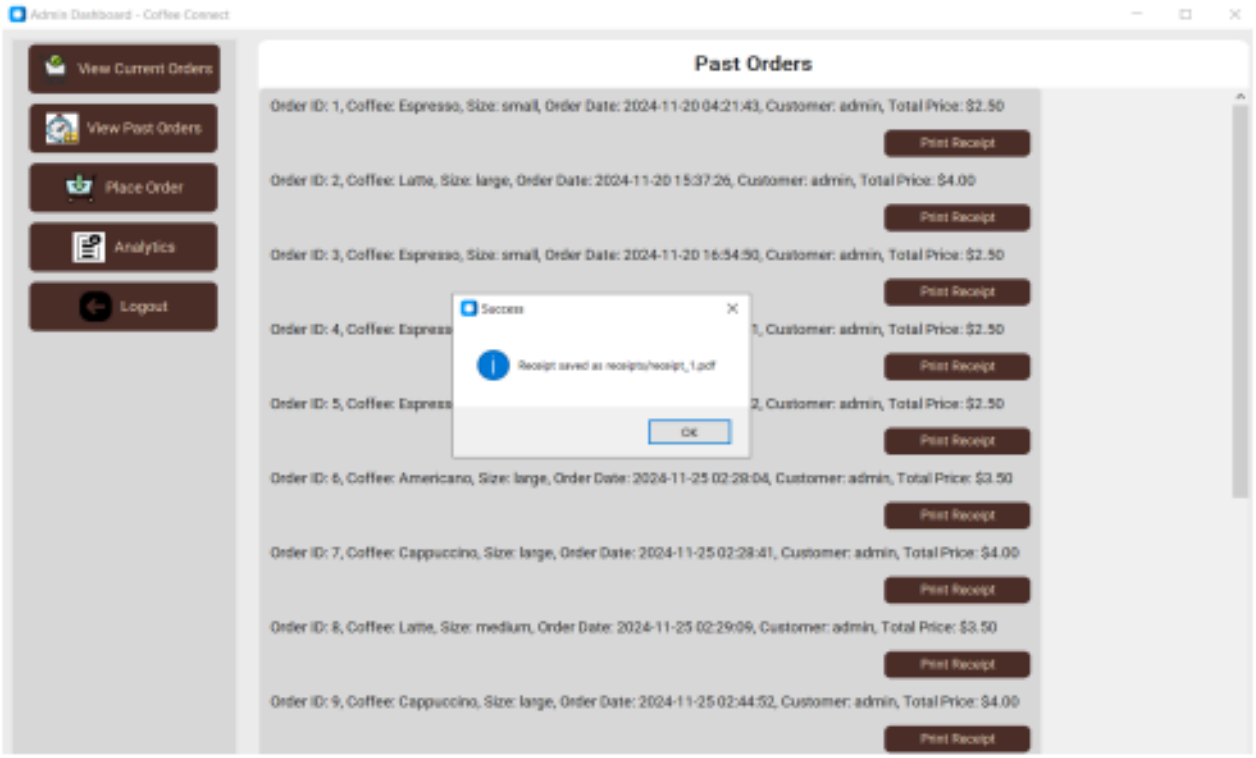
12.8 Admin Login Screen:



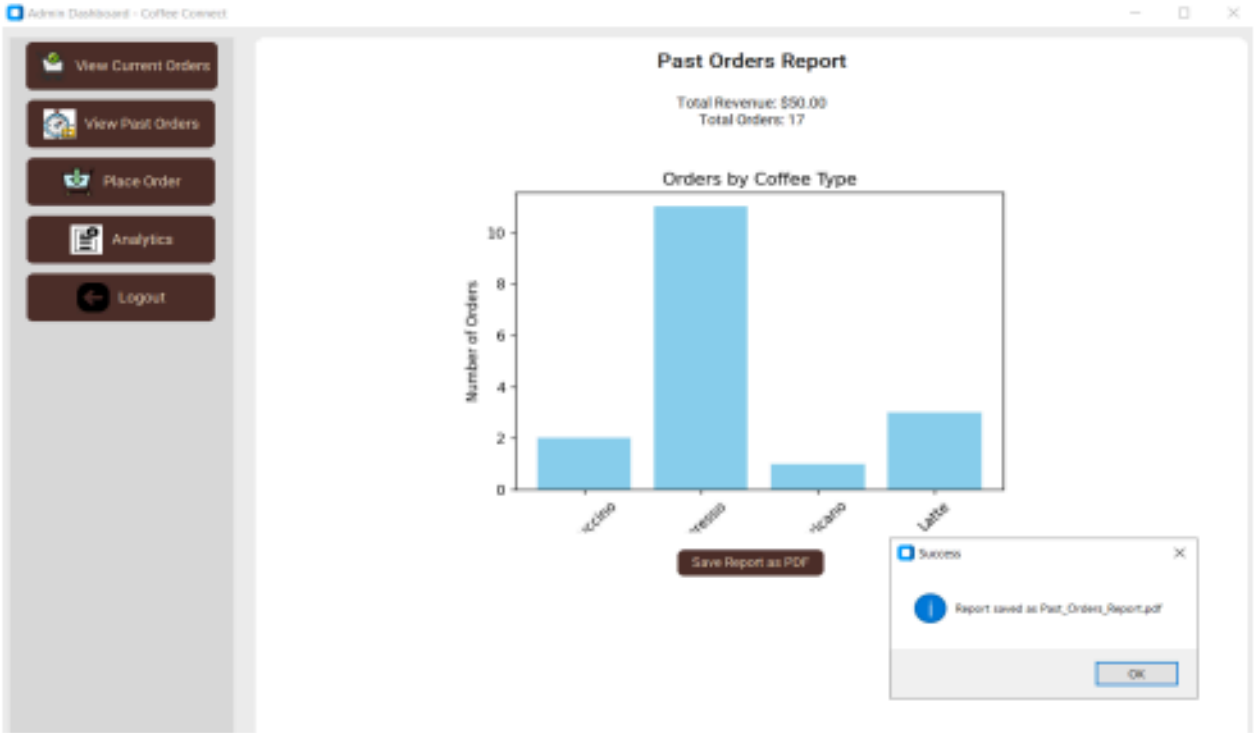
12.9 Current Orders Screen:



12.10 Past Orders Screen:



12.11 Analytics Screen:



13. Conclusion

Coffee Connect offers a practical solution to the operational challenges faced by Java Junction. By leveraging Python and MySQL, the system will streamline the ordering process, enhance sales tracking, and provide valuable insights to support business decisions. The project's economic, technical, schedule and operational feasibility indicate a high likelihood of success, making it a worthwhile endeavor for the Information Systems Capstone. Considering the Waterfall model for the scheduled tasks mentioned above, we can achieve the “Coffee Connect “project, which ultimately helps us better manage customer orders, sales analytics, and inventory to improve order processing and reduce errors.