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Customer Invoice Management System

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# Description

This project based on an invoice management system that has been developed using java and MySQL. It tracks all the information on customers, products, and invoices in the system. I have developed all types of CRUD (Create, Read, Update and Delete) operations an administrator can do to the customer, product and invoice database tables using GUI’s.

An administrator will be able to add new customers to the database. See a list of all the customers details in the system. Admin will also be able to edit, update and delete records of the customers in the system.

An administrator will be able to create new invoices in the database. View a list of all invoice details stored in the system. In addition, administrators will be able to edit, update, and delete invoices in the system.

New products can be added to the database by an administrator. View a list of all the product details in the system as well as the product stock. Admin will also be able to edit, update, and delete customer records in the system.

This system has error handling, so if a user wants to sign up for the system but forgets to enter some required details, the system will prompt the user to fill in that field before they can sign up.

# Requirements

For this project I created a system to manage customer purchases. The system is made up of the following components:

There is a backend database for this system with the following 4 tables, administrator table, customer table, product table and invoice table.

The customer table and product table are joint into invoice table because the customer ID and Product ID is needed in the invoice table.

I used MySQL Workbench for the database and MySQL Installer for the MySQL server.

This system has CRUD (create, retrieve, update, delete) operations on the database. Administrator can CRUD the customer, product, and invoice tables in the system.

This system provides error handling, so if the user wants to sign up into the system and forgets to enter some details that are required, it will prompt the user to fill in that field before they can sign up. Also, when the user is signing in into the system, the user must use the correct email and password to login or else it will prompt the user that the email or password is wrong.

This system demonstrates the use of several Swing components such as (JFrame, JPanel, JTextField, JLabel, JOptionPane, SwingConstants, ButtonGroup, JComboBox, JRadioButton, JScrollBar, UIManager and JPasswordField ).

# Functionality

## Login GUI

* Use Email address and password to login into system.
* Click the sign-up button if you do not have an account to login in with.
* If the email and password entered does not match with the email and password in the database, a popup will appear saying “incorrect email or password”.

## Sign up GUI

* User provides their details into the text fields and creates an account into the database so they can sign in.
* There is a button for the user to clear all the details entered in the text box if they user wants to re-write their details again.
* If the user created the account, the user could click the sign in button to log into the system.
* If the user clicks the sign-up button and text box fields are empty, it will prompt the user saying for example “first name is required” or “password is required” and so on until all the fields are completed…

## Customer GUI

* Once the administrator logs in, they will be brought onto the Customer GUI.
* On this GUI the administrator will have CRUD operations to perform on the customer’s table.
* The administrator will be able to enter details into the text fields and press the create button to create a new customer into the database. They will also be able to select a row in the customer table in the GUI and it will show the customer details in the text box fields. The administrator will be able to update the fields by changing the details and clicking the update button to update the customer details in the database. The administrator can also select a customer from the table and click the delete customer button to remove a customer from the database.
* At the top right of the GUI the administrator can click the product or invoice button to go to the product or invoice GUI.

## Product GUI

* The administrator will have CRUD operations to perform on the product table.
* The administrator can enter information into the text fields and press the create button to add a new product to the database. They will also be able to select a row in the product table in the GUI, and the product details will be displayed in the text box fields. The administrator will be able to update the fields in the database by changing the details and clicking the update button. The administrator can also remove a product from the database by selecting a product from the table and clicking the delete product button.
* At the top right of the GUI the administrator can click the invoice or customer button to go to the invoice or customer GUI.

## Invoice GUI

* The administrator will have CRUD operations to perform on the invoice table.
* The administrator will be able to enter details into the text fields and press the create button to create a new invoice into the database. They will also be able to select a row in the invoice table in the GUI and it will show the invoice details in the text box fields. The administrator will be able to update the fields by changing the details and clicking the update button to update the invoice details in the database. The administrator can also select an invoice from the table and click the delete invoice button to remove an invoice from the database.
* At the top right of the GUI the administrator can click the product or customer button to go to the product or customer GUI.

# Database Tables

## Administrator Table

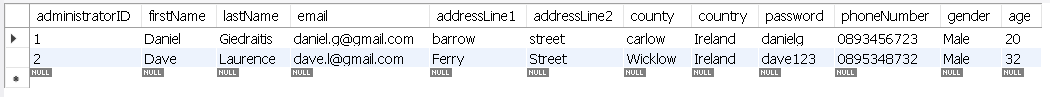
Structure:

administratorID has a primary key and auto increment on it. Email has a unique key.

Table

Description automatically generated

Data:



DDL for Administrator Table:

Text

Description automatically generated with low confidence

## Customer Table

Structure:

Table

Description automatically generatedcustomerID has a primary key and auto increment on it. Email has a unique key.

Table

Description automatically generatedData:

Text

Description automatically generated with medium confidenceDDL for Customer Table:

## Product Table

Structure:

Table

Description automatically generatedproductID has a primary key and auto increment on it.

Graphical user interface

Description automatically generated with medium confidenceData:

DDL for Product Table:

Graphical user interface, text

Description automatically generated

## Invoice Table

Structure:

invoiceID, customerID and productID has a primary key. invoiceID has auto increment on it.

Table

Description automatically generated

Data:

Table

Description automatically generated

DDL for Invoice Table:

Graphical user interface, text, application

Description automatically generated

# Entity Relationship Diagram

Diagram

Description automatically generated

# Interesting source code snippets

Graphical user interface, text, application

Description automatically generatedThis method is used to connect to the database in workbench:

SaveToDatabase method is used to insert customer details such as first name, last name, email etc… into the database.

Graphical user interface, text

Description automatically generated

ShowData method is used to show all the customer details in the database into the table of the GUI so that the administrator can use CRUD operations on them.

Graphical user interface, text, application

Description automatically generated

Text

Description automatically generated

Text

Description automatically generatedSetTextField method is used to populate the text fields with customer details when ever the user selects a row in the table.

Graphical user interface, text, application

Description automatically generatedThe Update method is used when the administer decides to edit the customer details and update the details into the database.

Graphical user interface, text, application, email

Description automatically generated The Delete method is used whenever the administer click on a customer in the table and clicks the delete button to remove the customer from the table and database.

# GUI Screens

Login GUI:

Graphical user interface, application

Description automatically generated

Graphical user interface

Description automatically generatedSign Up GUI:

GUI for Administrator to use CRUD operations on Customer details in database:

Table

Description automatically generated

GUI for Administrator to use CRUD operations on Product details in database:

Graphical user interface, table

Description automatically generated

GUI for Administrator to use CRUD operations on Invoice’s in database:

Graphical user interface

Description automatically generated

# Test Data

## Login Screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Data Number | Step | Expected  Result | Result | Status |
| L1 | System Started | Connection to database complete and login screen displayed | Connection to database complete and login screen displayed | Pass |
| L2 | User clicks Sign Up button | Sign up GUI is shown | Sign up GUI is shown | Pass |
| L3 | User clicks Sign in button with incorrect details in Email and Password field | User is prompted with message saying “incorrect email or password” | User is prompted with message saying “incorrect email or password” | Pass |
| L4 | User clicks Sign in with correct details in Email and Password field | The main customer GUI is then displayed for the user | The main customer GUI is then displayed for the user | Pass |
| L5 | User clicks the x button at the top right of the GUI | GUI closes | GUI closes | Pass |

## Sign Up Screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Data Number | Step | Expected  Result | Result | Status |
| L1 | User clicks the “Sign in page” button | Sign in GUI is shown | Sign in GUI is shown | Pass |
| L2 | User enters details into the text box fields and clicks the “clear button” | All the text fields and radio buttons get cleared and screen is back to default | All the text fields and radio buttons get cleared and screen is back to default | Pass |
| L3 | User clicks the “Sign up button” with no details entered | GUI will prompt user saying information is missing | GUI will prompt user saying information is missing | Pass |
| L4 | User clicks “Sign Up button” with password field missing | “Password is required” message is prompted | “Password is required” message is prompted | Pass |
| L5 | User clicks the “Sign up button” with correct details in the form | The Administrator table in the database is updated with the new details entered | The Administrator table in the database is updated with the new details entered | Pass |
| L6 | User clicks the x button at the top right of the GUI | GUI closes | GUI closes | Pass |

## Customer Details Screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Data Number | Step | Expected  Result | Result | Status |
| L1 | User enters details into the text box field and click on the “Create Customer” button | All the customer details that got entered in the text box fields are sent to the customer table of the database, also table in GUI is updated | All the customer details that got entered in the text box fields are sent to the customer table of the database, also table in GUI is updated | Pass |
| L2 | User selects a customer from the table in the GUI | The text box fields are then populated with the customer details | The text box fields are populated with the customer details | Pass |
| L3 | User changes customer details and clicks the “Update Customer” button | The customer details are updated in the customer table of the database, also table in GUI is updated | The customer details are updated in the customer table of the database, also table in GUI is updated | Pass |
| L4 | User selects a customer and clicks the “Delete Customer” button | Customer is deleted from the customer table of the database, also removes customer from the table in the GUI | Customer is deleted from the customer table of the database, also removes customer from the table in the GUI | Pass |
| L5 | User clicks either the “Customer”, “Product” or “Invoice” button | The button the user selects, the screen pops up, for example user selects “Product” button, Product Screen is then displayed | The button the user selects, the screen pops up, for example user selects “Product” button, Product Screen is then displayed | Pass |
| L6 | User clicks the x button at the top right of the GUI | GUI closes | GUI closes | Pass |

## Product Details Screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Data Number | Step | Expected  Result | Result | Status |
| L1 | User enters details into the text box field and click on the “Create Product” button | All the product details that got entered in the text box fields are sent to the product table of the database, also table in GUI is updated | All the product details that got entered in the text box fields are sent to the product table of the database, also table in GUI is updated | Pass |
| L2 | User selects a product from the table in the GUI | The text box fields are then populated with the product details | The text box fields are then populated with the product details | Pass |
| L3 | User changes product details and clicks the “Update Product” button | The product details are updated in the product table of the database, also table in GUI is updated | The product details are updated in the product table of the database, also table in GUI is updated | Pass |
| L4 | User selects a product and clicks the “Delete Product” button | Product is deleted from the product table of the database, also removes product from the table in the GUI | Product is deleted from the product table of the database, also removes product from the table in the GUI | Pass |
| L5 | User clicks either the “Customer”, “Product” or “Invoice” button | The button the user selects, the screen pops up, for example user selects “Customer” button, Customer Screen is then displayed | The button the user selects, the screen pops up, for example user selects “Customer” button, Customer Screen is then displayed | Pass |
| L6 | User clicks the x button at the top right of the GUI | GUI closes | GUI closes | Pass |

## Invoice Details Screen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Data Number | Step | Expected  Result | Result | Status |
| L1 | User enters details into the text box field and click on the “Create Invoice” button | All the invoice details that got entered in the text box fields are sent to the invoice table of the database, also table in GUI is updated | All the invoice details that got entered in the text box fields are sent to the invoice table of the database, also table in GUI is updated | Pass |
| L2 | User selects an invoice from the table in the GUI | The text box fields are then populated with the invoice details | The text box fields are then populated with the invoice details | Pass |
| L3 | User changes invoice details and clicks the “Update Invoice” button | The invoice details are updated in the invoice table of the database, also table in GUI is updated | The invoice details are updated in the invoice table of the database, also table in GUI is updated | Pass |
| L4 | User selects an invoice and clicks the “Delete Invoice” button | Invoice is deleted from the invoice table of the database, also removes invoice from the table in the GUI | Invoice is deleted from the invoice table of the database, also removes invoice from the table in the GUI | Pass |
| L5 | User clicks either the “Customer”, “Product” or “Invoice” button | The button the user selects, the screen pops up, for example user selects “Customer” button, Customer Screen is then displayed | The button the user selects, the screen pops up, for example user selects “Customer” button, Customer Screen is then displayed | Pass |
| L6 | User clicks the x button at the top right of the GUI | GUI closes | GUI closes | Pass |