Laxmi Charitable Trust's

Sheth L.U.J. & Sir M.V. College of Arts, Science & Commerce

Dr. S Radhakrishnan Marg, Andheri (E), Mumbai – 400 069.

DEPARTMENT OF INFORMATION TECHNOLOGY

Certificate

This is to certify that the following students of S. Y. B. Sc. Information Technology (Semester III)

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2. Adiba Shaikh — Roll No. S 040
3. Salem Shaikh — Roll No. S 042
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have completed the project, entitled Product Management System Using GUI and Database carried out for the subject Python Programming during the academic year 2024 - 2025 under the guidance of Asst. Prof. Sneha Gokarnkar.

Date: 24-09-2024

Signature of Subject Teacher

Signature of Coordinator

25/9/2024

Product Management System Using GUI & Database

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Github link: [product management system]

Description:

A product management system used in malls built with the help of Python, Tkinter, and SQLite.

It is useful to fetch or modify the respective data which is needed. We can delete, update, add data according to our necessity.

Q) Design a database application using python GUI to modify specified record of an product for product id using database and display the modified record . (product id, name, quantity, price and star rating)

1) Import Tkinter and sqlite

```
import tkinter as tk
from tkinter import messagebox
import sqlite3
```

2) Create database

```
# Database setup
def create_table():
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    cursor.execute('''CREATE TABLE IF NOT EXISTS products
                      (product_id INTEGER PRIMARY KEY,
                       name TEXT,
                       quantity INTEGER,
                       price_per_unit REAL,
                       rating REAL)''')
    conn.commit()
    conn.close()
```

3) Define function add_product, get_all_products, get_product, update_product, delete_product, modify_record, save_changes, clear_fields, update_product_list, update_total_price, delete_record and select_product.

A) add_product

```
# Function to add a product to the database with error handling
def add_product(product_id, name, quantity, price_per_unit, rating):
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    try:
        cursor.execute('''INSERT INTO products (product_id, name, quantity, price_per_unit, rating)
                          VALUES (?, ?, ?, ?, ?)''', (product_id, name, quantity, price_per_unit, rating))
        conn.commit()
        messagebox.showinfo("Success", "Product added successfully!")
        update_product_list()  # Update product list after adding
        update_total_price()    # Update total price after adding
    except sqlite3.IntegrityError:
        messagebox.showerror("Error", "Product ID already exists. Use a unique Product ID.")
    except Exception as e:
        messagebox.showerror("Database Error", str(e))
    finally:
        conn.close()
```

B) Get_all_products

```
# Function to retrieve all products from the database
def get_all_products():
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    cursor.execute('''SELECT * FROM products''')
    products = cursor.fetchall()
    conn.close()
    return products
```

C) Get_product

```
# Function to retrieve a product's details from the database
def get_product(product_id):
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    cursor.execute('''SELECT * FROM products WHERE product_id = ?''', (product_id,))
    product = cursor.fetchone()
    conn.close()
    return product
```

D) Update_product

```
# Function to update a product's details in the database
def update_product(product_id, name, quantity, price_per_unit, rating):
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    cursor.execute('''UPDATE products SET name = ?, quantity = ?, price_per_unit = ?, rating = ?
                      WHERE product_id = ?''', (name, quantity, price_per_unit, rating, product_id))
    conn.commit()
    conn.close()
    update_product_list()  # Update product list after modifying
    update_total_price()   # Update total price after modifying
```

E) delete_product

```
# Function to delete a product from the database
def delete_product(product_id):
    conn = sqlite3.connect('products.db')
    cursor = conn.cursor()
    cursor.execute('''DELETE FROM products WHERE product_id = ?''', (product_id,))
    conn.commit()
    conn.close()
    update_product_list()  # Update product list after deleting
    update_total_price()   # Update total price after deleting
```

F) modify_record

```
# Function to modify product (opens a new pop-up window)
def modify_record():
    product_id = product_id_entry.get()
    if product_id:
        try:
            product = get_product(int(product_id))
            if product:
                # Open a new window for modifying the record
                modify_window = tk.Toplevel(root)
                modify_window.title("Modify Product")

                tk.Label(modify_window, text="Product ID:").grid(row=0, column=0)
                tk.Label(modify_window, text=product[0]).grid(row=0, column=1)  # Product ID is not editable

                tk.Label(modify_window, text="Name:").grid(row=1, column=0)
                name_entry = tk.Entry(modify_window)
                name_entry.grid(row=1, column=1)
                name_entry.insert(0, product[1])

                tk.Label(modify_window, text="Quantity:").grid(row=2, column=0)
                quantity_entry = tk.Entry(modify_window)
                quantity_entry.grid(row=2, column=1)
                quantity_entry.insert(0, product[2])

                tk.Label(modify_window, text="Price per Unit:").grid(row=3, column=0)
                price_entry = tk.Entry(modify_window)
                price_entry.grid(row=3, column=1)
                price_entry.insert(0, product[3])

                tk.Label(modify_window, text="Rating:").grid(row=4, column=0)
                rating_entry = tk.Entry(modify_window)
                rating_entry.grid(row=4, column=1)
                rating_entry.insert(0, product[4])
```

G) save_changes

```
                # Function to save changes in the pop-up window
                def save_changes():
                    try:
                        update_product(
                            int(product[0]),  # product_id is fixed
                            name_entry.get(),
                            int(quantity_entry.get()),
                            float(price_entry.get()),
                            float(rating_entry.get())
                        )
                        messagebox.showinfo("Success", "Record updated successfully!")
                        modify_window.destroy()
                    except ValueError:
                        messagebox.showerror("Input Error", "Please enter valid data.")

                # Save button inside the pop-up window
                save_button = tk.Button(modify_window, text="Save", command=save_changes)
                save_button.grid(row=5, column=0, columnspan=2)

            else:
                messagebox.showerror("Error", "Product ID not found.")
        except ValueError:
            messagebox.showerror("Input Error", "Please enter a valid Product ID.")
    else:
        messagebox.showerror("Input Error", "Please enter a Product ID.")
```

H) clear_fields

```
# Function to clear input fields
def clear_fields():
    product_id_entry.delete(0, tk.END)
    name_entry.delete(0, tk.END)
    quantity_entry.delete(0, tk.END)
    price_entry.delete(0, tk.END)
    rating_entry.delete(0, tk.END)
```

I) update_product_list

```
# Function to update the product list
def update_product_list():
    product_listbox.delete(0, tk.END)  # Clear the listbox
    products = get_all_products()
    for product in products:
        total_price = product[2] * product[3]  # Quantity * Price per unit
        product_listbox.insert(tk.END, f"ID: {product[0]}, Name: {product[1]}, Qty: {product[2]}, Price per Unit: {product[3]:.2f}, Total Price: {total_price:.2f}, Rating: {product[4]}")
```

J) update_total_price

```
# Function to calculate and display the total price of all products
def update_total_price():
    total_price = sum(product[2] * product[3] for product in get_all_products())  # Sum up total prices
    total_price_label.config(text=f"Total Price of All Products: {total_price:.2f}")
```

K) delete_record

```
# Function to delete a record from the database
def delete_record():
    product_id = product_id_entry.get()
    if product_id:
        try:
            product = get_product(int(product_id))
            if product:
                delete_product(int(product_id))
                messagebox.showinfo("Success", f"Product ID {product_id} deleted successfully!")
                clear_fields()  # Clear fields after deletion
            else:
                messagebox.showerror("Error", "Product ID not found.")
        except ValueError:
            messagebox.showerror("Input Error", "Please enter a valid Product ID.")
    else:
        messagebox.showerror("Input Error", "Please enter a Product ID.")
```

L) select_product

```
# Function to populate fields when selecting an item from the list
def select_product(event):
    selected_product = product_listbox.curselection()
    if selected_product:
        index = selected_product[0]
        product_info = product_listbox.get(index)
        product_id = int(product_info.split(", ")[0].split(": ")[1])
        product = get_product(product_id)

        if product:
            product_id_entry.delete(0, tk.END)
            product_id_entry.insert(0, product[0])
            name_entry.delete(0, tk.END)
            name_entry.insert(0, product[1])
            quantity_entry.delete(0, tk.END)
            quantity_entry.insert(0, product[2])
            price_entry.delete(0, tk.END)
            price_entry.insert(0, product[3])
            rating_entry.delete(0, tk.END)
            rating_entry.insert(0, product[4])
```

4) GUI setup

```
# GUI Setup
root = tk.Tk()
root.title("Product Record Modifier")
root.configure(bg='#f0f8ff')  # Light blue background
```

a) Add Labels and input fields with styling.

```
# Labels and input fields with styling
tk.Label(root, text="Product ID:", bg='#f0f8ff', font=("Arial", 12)).grid(row=0, column=0)
product_id_entry = tk.Entry(root, font=("Arial", 12))
product_id_entry.grid(row=0, column=1)

tk.Label(root, text="Name:", bg='#f0f8ff', font=("Arial", 12)).grid(row=1, column=0)
name_entry = tk.Entry(root, font=("Arial", 12))
name_entry.grid(row=1, column=1)

tk.Label(root, text="Quantity:", bg='#f0f8ff', font=("Arial", 12)).grid(row=2, column=0)
quantity_entry = tk.Entry(root, font=("Arial", 12))
quantity_entry.grid(row=2, column=1)

tk.Label(root, text="Price per Unit:", bg='#f0f8ff', font=("Arial", 12)).grid(row=3, column=0)
price_entry = tk.Entry(root, font=("Arial", 12))
price_entry.grid(row=3, column=1)

tk.Label(root, text="Star Rating:", bg='#f0f8ff', font=("Arial", 12)).grid(row=4, column=0)
rating_entry = tk.Entry(root, font=("Arial", 12))
rating_entry.grid(row=4, column=1)
```

b) Product listbox

```
# Product listbox
product_listbox = tk.Listbox(root, width=70, font=("Arial", 12))
product_listbox.grid(row=5, column=0, columnspan=5)
```

c) Total price label

```
# Total price label
total_price_label = tk.Label(root, text="Total Price of All Products: 0.00", bg='#f0f8ff', font=("Arial", 12))
total_price_label.grid(row=6, column=1, columnspan=2)
```

d) Buttons with styling

```
# Buttons with styling
tk.Button(root, text="Add Product", command=lambda: add_product(
    int(product_id_entry.get()),
    name_entry.get(),
    int(quantity_entry.get()),
    float(price_entry.get()),
    float(rating_entry.get())
), bg='#add8e6', font=("Arial", 12)).grid(row=7, column=0)

tk.Button(root, text="Modify Product", command=modify_record, bg='#add8e6', font=("Arial", 12)).grid(row=7, column=1)
tk.Button(root, text="Delete Product", command=delete_record, bg='#add8e6', font=("Arial", 12)).grid(row=7, column=2)
```

e) select event

```
# Binding select event
product_listbox.bind('<<ListboxSelect>>', select_product)
```

f) Create the database table

```
# Create the database table
create_table()
```

g) Initialize the product list and total price

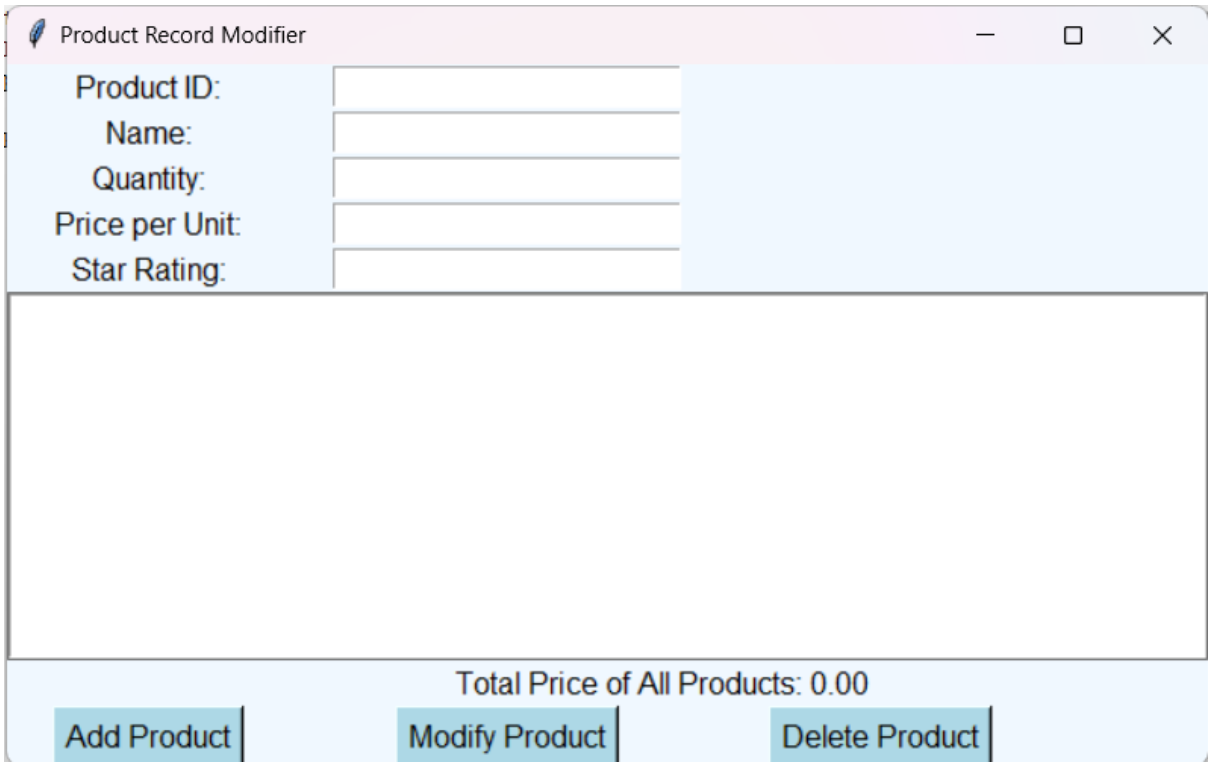
```
# Initialize the product list and total price
update_product_list()
update_total_price()
```

h) Run the application

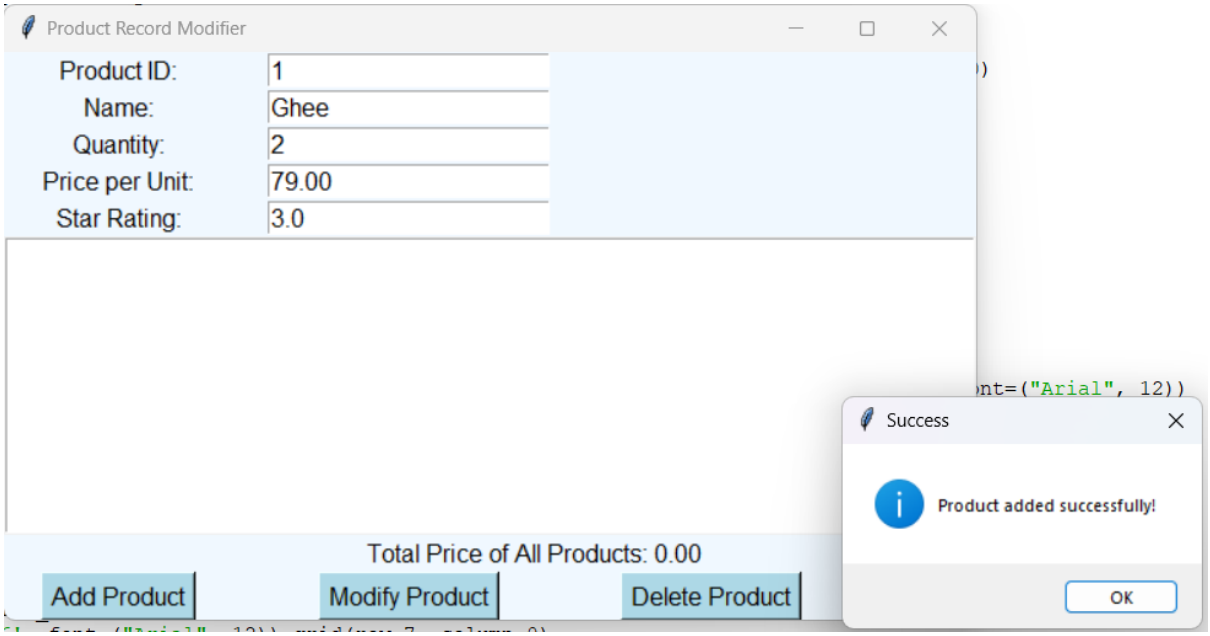
```
# Run the application
root.mainloop()
```

OUTPUT:

1) GUI INTERFACE

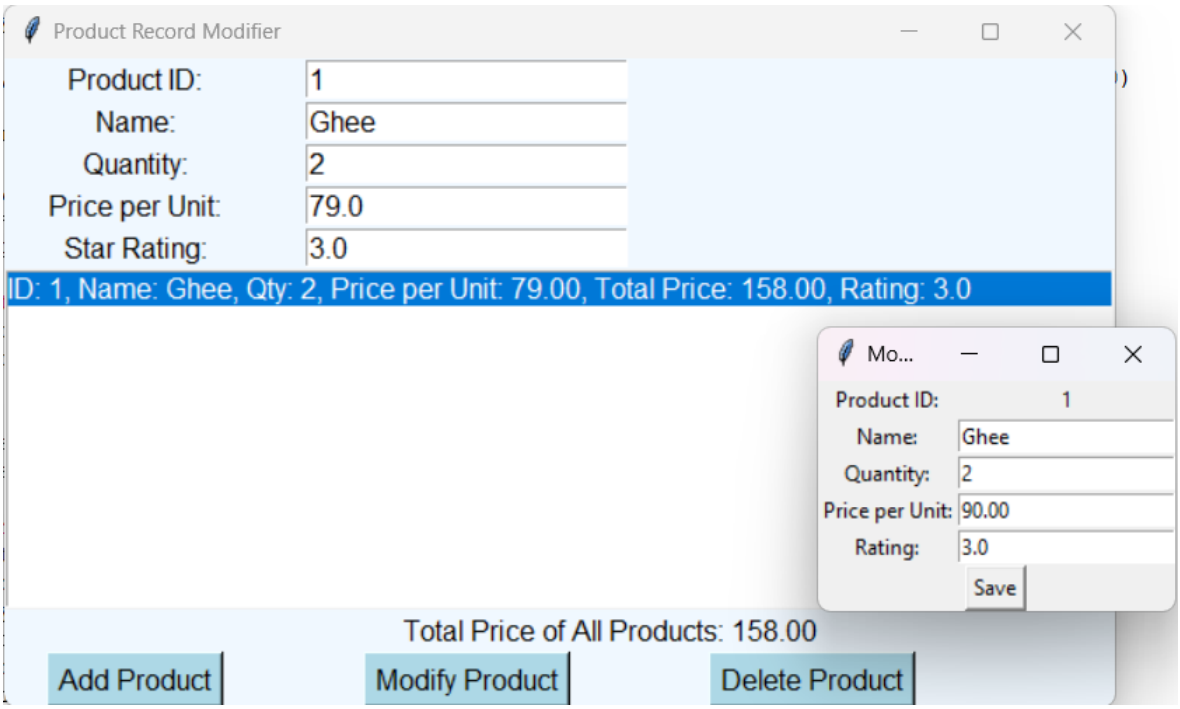


2) ADD PRODUCT

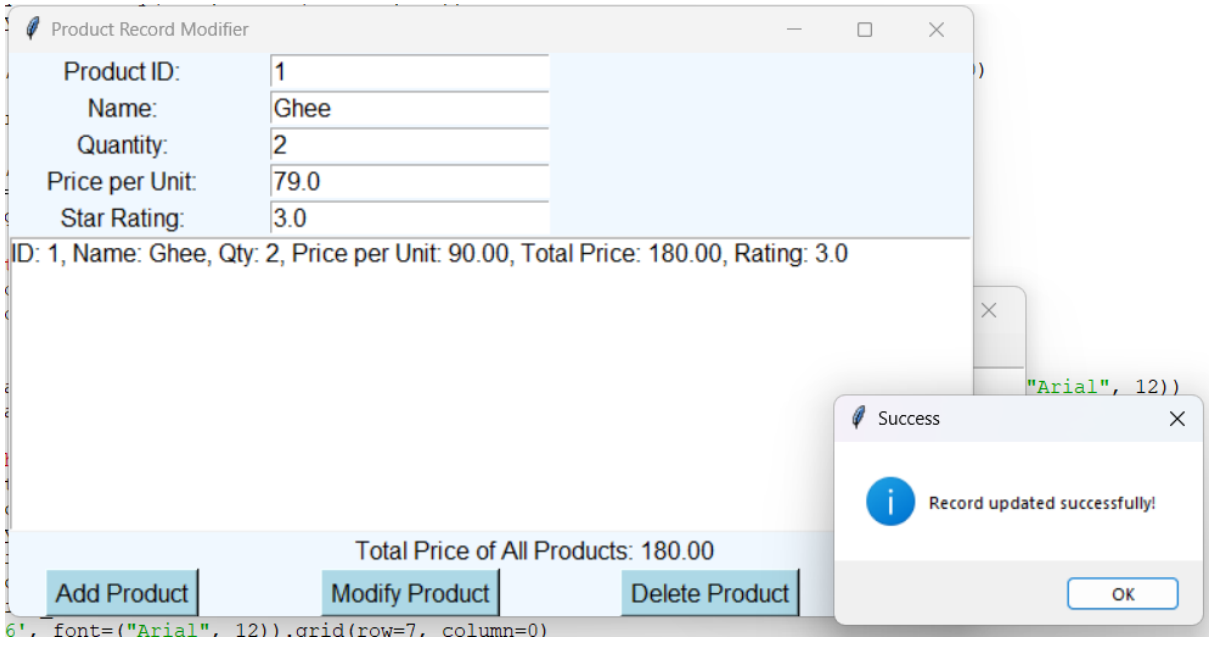


3) MODIFY PRODUCT

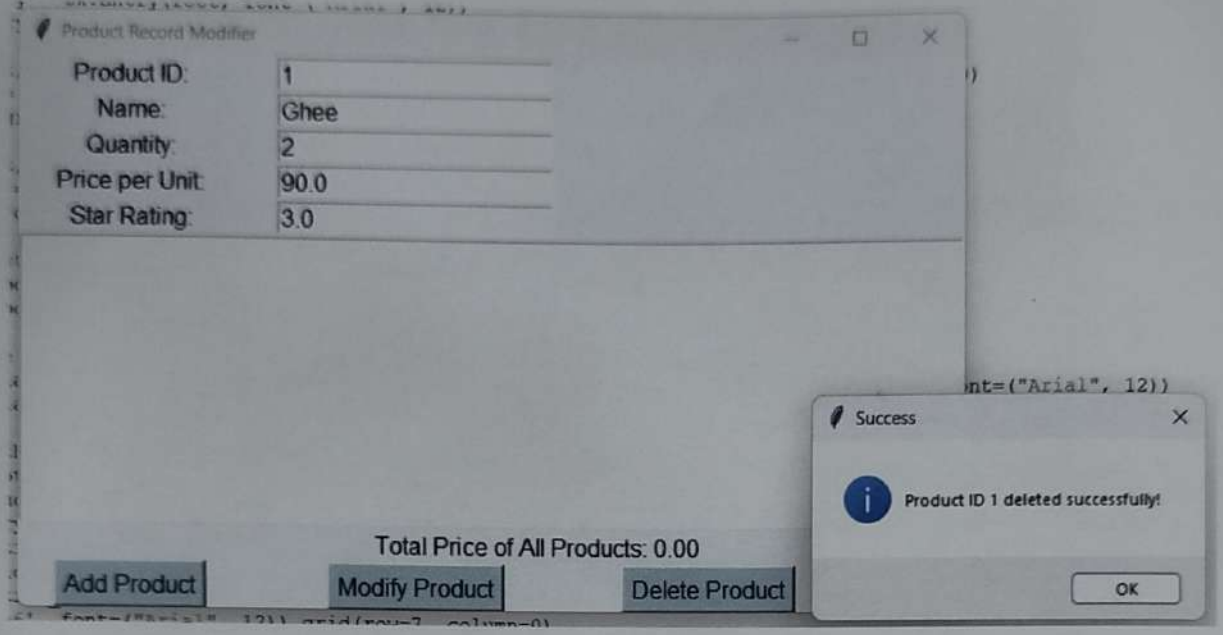
A) CHANGING PRODUCT PRICE



B) MODIFIED SUCCESSFULLY



4) DELETE PRODUCT



CONCLUSION: -

Our application allows users to:

Add products with details such as quantity, price, and rating. Modify or delete existing products. Display all products in a list. Calculate and display the total price of all products. All of these operations are performed through an intuitive graphical interface built using "Tkinter", and data is stored securely using SQLite.

28/9/2024