NATIONAL POST GRADUATE COLLEGE

INVENTORY MANAGEMENT SYSTEM (C#)

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INDEX

DATA MODELS:

```
/*This library contains all the Db-Tables equivalent classes
 * so that the data returned by SQL queries can be managed easily
 * in the codebase.
 */
using DataAccessLayer;

namespace DataModels
{
   public class Captcha
   {
      public string id;
      public string Text;
      public string Path;

      public Captcha(string id, string text, string path)
      {
         this.id = id;
         this.Text = text;
         this.Path = path;
      }
   }

   public class ShippingAddress{
      public string? id { get; set; }
      public string customer_id {  get; set; }
      public string city { get; set; }
      public string state {  get; set; }
      public string country { get; set; }
      public string? more { get; set; }

      public ShippingAddress(string customer_id, string city, string state, string country, string more = "") {
         this.customer_id = customer_id;
         this.city = city;
         this.state = state;
         this.country = country;
         this.more = more;
      }

      override
      public string ToString()
      {
         return $"{id}) {city}, {state}, {country}";
      }
   }

   public class LoginSession {
      public string? id { get; set; }
      public string employee_id { get; set; }
      public string? loggedInAt { get; set; }
      public LoginSession(string employee_id)
      {
         this.employee_id = employee_id;
      }
   }
```

```
public class Employee
{
   public string? id { get; set; }
   public decimal salary { get; set; }
   public Role role { get; set; }
   public string passwordHash { get; set; }

   public Employee(decimal salary, Role role, string passwordHash)
   {
      this.salary = salary;
      this.role = role;
      this.passwordHash = passwordHash;
   }

   override
   public string ToString()
   {
      return $"{id}) {role}";
   }
}

public class Supplier
{
   public string? id { get; set; }
   public string email { get; set; }
   public Supplier_Type supplier_type { get; set; }

   public Supplier(string email, Supplier_Type supplier_type)
   {
      this.email = email;
      this.supplier_type = supplier_type;
   }

   override
   public string ToString()
   {
      User user = SqlUser.getBySupplierId(this.id);
      return $"{id}) {user.firstName}";
   }
}

public class Customer
{
   public string? id { get; set; }
   public string? supplier { get; set; }
   public string email { get; set; }
   public Customer_Type customer_type { get; set; }

   public Customer(string email, Customer_Type customer_type)
   {
      this.email = email;
      this.customer_type = customer_type;
   }

   override
   public string ToString()
   {
```

```
        return $"{id}) {email}";
    }
}

public class Brand
{
    public string? id { get; set; }
    public string title { get; set; }
    public string? summary { get; set; }
    public Popularity popularity { get; set; }

    public Brand(string title, Popularity popularity, string? summary = null)
    {
        this.title = title;
        this.summary = summary;
        this.popularity = popularity;
    }

    override
    public string ToString()
    {
        return $"{id}) {title}";
    }
}

public class Payment
{
    public string? id { get; set; }
    public string user_id { get; set; }
    public string order_id { get; set; }
    public string shippingAddress_id{ get; set; }
    public Mode mode{ get; set; }
    public Status status { get; set; }
    public string? createdAt { get; set; }
    public Type type { get; set; }

    public Payment(string user_id, string order_id, string shippingAddress_id, Mode mode, Status status, Type
type, string? createdAt = "")
    {
        this.user_id = user_id;
        this.order_id = order_id;
        this.shippingAddress_id = shippingAddress_id;
        this.mode = mode;
        this.status = status;
        this.createdAt = createdAt;
        this.type = type;
    }
}

public class Order_Item
{
    public string? id { get; set; }
    public string product_id { get; set; }
    public string item_id { get; set; }
    public string order_id { get; set; }
    public decimal price { get; set; }
    public long quantity { get; set; }
```

```
        public decimal total_price { get; set; }

        public Order_Item(string product_id, string item_id, string order_id, decimal price, long quantity, decimal
total_price)
        {
            this.product_id = product_id;
            this.item_id = item_id;
            this.order_id = order_id;
            this.price = price;
            this.quantity = quantity;
            this.total_price = total_price;
        }
    }

    public class Item
    {
        public string? id { get; set; }
        public string product_id { get; set; }
        public string brand_id { get; set; }
        public string supplier_id { get; set; }
        public decimal price { get; set; }
        public int discount { get; set; }
        public long quantity { get; set; }
        public decimal stockValue { get; set; }
        public long alarm_quantity{ get; set; }

        public Item(string product_id, string brand_id, string supplier_id, decimal price, int discount, long
quantity, decimal stockValue, long alarm_quantity) {
            this.product_id= product_id;
            this.brand_id= brand_id;
            this.supplier_id= supplier_id;
            this.price = price;
            this.discount = discount;
            this.quantity = quantity;
            this.stockValue = stockValue;
            this.alarm_quantity = alarm_quantity;
        }


    }

    public class Order
    {
        public string? id { get; set; }
        public string user_id { get; set; }
        public string employee_id { get; set; }
        public Type type { get; set; }
        public decimal subTotal { get; set; }
        public decimal tax { get; set; }
        public decimal total { get; set; }

        public Order(string user_id, string employee_id, Type type, decimal subTotal, decimal tax, decimal total)
        {
            this.user_id = user_id;
            this.employee_id = employee_id;
            this.type = type;
            this.subTotal = subTotal;
```

```
        this.tax = tax;
        this.total = total;
    }
}

public class User
{
    public string? id { get; set; }
    public string? supplier_id { get; set; }
    public string? customer_id { get; set; }
    public string? employee_id { get; set; }
    public User_Type user_type { get; set; }
    public string firstName { get; set; }
    public string? lastName{ get; set; }
    public string username{ get; set; }
    public string mobile { get; set; }
    public string email { get; set; }
    public string address { get; set; }
    public string? registeredAt { get; set; }

    public User(User_Type user_type, string firstName, string username, string mobile, string email, string
address, string? supplier_id = null, string? customer_id = null, string? employee_id = null, string lastName = "",
string registeredAt = "")
    {
        this.supplier_id = supplier_id;
        this.customer_id = customer_id;
        this.employee_id = employee_id;
        this.user_type = user_type;
        this.firstName = firstName;
        this.lastName = lastName;
        this.username = username;
        this.mobile = mobile;
        this.email = email;
        this.address = address;
        this.registeredAt = registeredAt;
    }
}

public class Product_Category
{
    public string? id { get; set; }
    public string category_id { get; set; }
    public string product_id { get; set; }

    public Product_Category(string category_id, string product_id)
    {
        this.category_id = category_id;
        this.product_id = product_id;
    }
}
public class Category
{
    public string? id { get; set; }
    public string title { get; set; }
    public string? description { get; set; }

    public Category(string title, string? description = null)
```

```
    {
        this.title = title;
        this.description = description;
    }
}
public class Product
{
    public string? id { get; set; }
    public string title { get; set; }
    public string? description { get; set; }
    public string? createdAt { get; set; }

    public Product(string title, string? description = null)
    {
        this.title = title;
        this.description = description;
    }

    override
    public string ToString()
    {
        return $"{id}) {title}";
    }
}


//Enumerations for Consistency
public enum Role
{
    Manager,
    Sales
}

public enum Supplier_Type
{
    Trusted,
    New
}

public enum Customer_Type
{
    Rich,
    Poor,
    Medium
}

public enum Popularity {
    Low,
    Medium,
    High
}

public enum Mode
{
    Online,
    Cod
}
```

```
    public enum Status
    {
        Pending,
        Finished,
        Failed
    }

    public enum Type
    {
        In,
        Out
    }

    public enum User_Type
    {
        Customer,
        Supplier,
        Employee
    }
}
```

DATA ACCESS LAYER:

```
using DataModels;
using Microsoft.Data.SqlClient;
using System.Collections.Generic;

namespace DataAccessLayer
{

    //Parent class for holding the connection object
    public class SqlHelper
    {
        //private as there's no need to access it from anywhere
        private static string _connString = "Data Source=PRIYANSHU\\SQLEXPRESS;Initial
Catalog=Inventory_Management_System;Integrated Security=True;TrustServerCertificate=True";

        //protected coz i'll use conn in the child classes
        protected static SqlConnection conn = new SqlConnection(_connString);
    }


    //Captcha---------------------->>>>
    public class SqlCaptcha : SqlHelper {
        public static int fetchNoOfCaptchas()
        {
            try
            {
                string query = "select COUNT(*) from captcha;";
                SqlCommand cmd = new SqlCommand(query, conn);
                conn.Open();
                int count = Convert.ToInt32(cmd.ExecuteScalar());
                conn.Close();
                cmd.Dispose();
                return count;
            }
```

```
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }

    }

    public static Captcha fetchRandomCaptcha(int noOfCaptchas)
    {
        try
        {
            Random random = new Random();
            int id = random.Next(noOfCaptchas) + 1; //+1 coz I don't want zero index;

            string query = $"select * from captcha where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);
            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();

            reader.Read();
            string text = reader["text"].ToString()!;
            string path = reader["path"].ToString()!;

            Captcha captcha = new Captcha(id.ToString(), text, path);
            conn.Close();
            cmd.Dispose();

            return captcha;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}



//ShippingAddress---------->>>>
public class SqlShippingAddress : SqlHelper
{
    //returns all shipping addresses of a customer
    public static List<ShippingAddress> getMany(string customer_id)
    {
        try
        {
            List<ShippingAddress> list = new List<ShippingAddress>();
            string query = $"select * from shippingAddress where customer_id = {customer_id}";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
```

```
            ShippingAddress shippingAddress = new ShippingAddress(reader["customer_id"].ToString()!,
reader["city"].ToString()!, reader["state"].ToString()!, reader["country"].ToString()!,
reader["more"].ToString()!);
            shippingAddress.id = reader["id"].ToString();
            list.Add(shippingAddress);
          }
          reader.Close();
          cmd.Dispose();
          conn.Close();

          return list;
        }
        catch (Exception ex)
        {

          conn.Close();
          throw new Exception(ex.Message);
        }
      }

      //getById
      public static ShippingAddress getById(string id)
      {
        try
        {
          string query = $"select * from shippingAddress where id = {id}";
          SqlCommand cmd = new SqlCommand(query, conn);

          conn.Open();
          SqlDataReader reader = cmd.ExecuteReader();
          reader.Read();

          ShippingAddress shippingAddress = new ShippingAddress(reader["customer_id"].ToString()!,
reader["city"].ToString()!, reader["state"].ToString()!, reader["country"].ToString()!,
reader["more"].ToString()!);
          shippingAddress.id = reader["id"].ToString();

          reader.Close();
          cmd.Dispose();
          conn.Close();

          return shippingAddress;
        }
        catch (Exception ex)
        {

          conn.Close();
          throw new Exception(ex.Message);
        }
      }

      //adds a new shippingAddress of a customer and returns shippingAddress object with the id
      public static ShippingAddress add(ShippingAddress shippingAddress)
      {
        try
        {
```

```
            string query = $"insert into shippingAddress (customer_id, city, state, country, more) values
(@customer_id, @city, @state, @country, @more); select SCOPE_IDENTITY()";
            SqlCommand cmd = new SqlCommand(query, conn);

            //if the members of object are null then equivalent Db null is added in Sql
            cmd.Parameters.AddWithValue("@customer_id", shippingAddress.customer_id);
            cmd.Parameters.AddWithValue("@city", shippingAddress.city);
            cmd.Parameters.AddWithValue("@state", shippingAddress.state);
            cmd.Parameters.AddWithValue("@country", shippingAddress.country);
            cmd.Parameters.AddWithValue("@more", shippingAddress.more ?? (object)DBNull.Value);

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;

            shippingAddress.id = id;

            cmd.Dispose();
            conn.Close();

            return shippingAddress;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);

        }
    }

    //delete
    public static void delete(string id)
    {
        try
        {
            string query = $"delete from shippingAddress where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //update
    public static void update(ShippingAddress shippingAddress)
    {
        try
        {
            string query = $"update shippingAddress set city = @city, state = @state, country = @country, more =
@more where id = @id;";
```

```
            SqlCommand cmd = new SqlCommand(query, conn);

            // Adding parameters with null checks
            cmd.Parameters.AddWithValue("@city", shippingAddress.city);
            cmd.Parameters.AddWithValue("@state", shippingAddress.state);
            cmd.Parameters.AddWithValue("@country", shippingAddress.country);
            cmd.Parameters.AddWithValue("@more", shippingAddress.more ?? (object)DBNull.Value);
            cmd.Parameters.AddWithValue("@id", shippingAddress.id);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //getAll
    public static List<ShippingAddress> getAll()
    {
        try
        {
            List<ShippingAddress> list = new List<ShippingAddress>();
            string query = $"select * from shippingAddress;";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
                ShippingAddress shippingAddress = new ShippingAddress(reader["customer_id"].ToString()!,
reader["city"].ToString()!, reader["state"].ToString()!, reader["country"].ToString()!,
reader["more"].ToString()!);
                shippingAddress.id = reader["id"].ToString();
                list.Add(shippingAddress);
            }
            reader.Close();
            cmd.Dispose();
            conn.Close();

            return list;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //makeSelf
    public static void makeSelf()
```

```
    {
        try
        {
            string query = $"insert into shippingAddress (customer_id, city, state, country, more) values
(@customer_id, @city, @state, @country, @more); select SCOPE_IDENTITY()";
            SqlCommand cmd = new SqlCommand(query, conn);

            //if the members of object are null then equivalent Db null is added in Sql
            cmd.Parameters.AddWithValue("@customer_id", SqlCustomer.getSelfId());
            cmd.Parameters.AddWithValue("@city", "self");
            cmd.Parameters.AddWithValue("@state", "self");
            cmd.Parameters.AddWithValue("@country", "self");
            cmd.Parameters.AddWithValue("@more", "self" ?? (object)DBNull.Value);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static string getSelfId()
    {
        try
        {
            string query = $"select id from shippingAddress where customer_id = @customer_id;";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@customer_id", SqlCustomer.getSelfId());

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
            string id = reader["id"].ToString()!;

            cmd.Dispose();
            conn.Close();
            return id;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//LoginSession---------->>>>
public class SqlLoginSession: SqlHelper
{
```

```
    //returns all Login Sessions of an employee
    public static List<LoginSession> getMany(Employee employee)
    {
      try
      {
        List<LoginSession> list = new List<LoginSession>();
        string query = $"select * from loginSession where employee_id = {employee.id}";
        SqlCommand cmd = new SqlCommand(query, conn);

        conn.Open();
        SqlDataReader reader = cmd.ExecuteReader();
        while (reader.Read())
        {
          LoginSession loginSession = new LoginSession(employee.id!);
          loginSession.id = reader["id"].ToString();
          loginSession.loggedInAt = reader["loggedInAt"].ToString();
          list.Add(loginSession);
        }
        reader.Close();
        cmd.Dispose();
        conn.Close();

        return list;
      }
      catch (Exception ex)
      {

        conn.Close();
        throw new Exception(ex.Message);
      }
    }

    //creates a loginSession for an employee and returns loginSession object with id and loggedInAt values
    public static LoginSession add(Employee employee)
    {
      try
      {
        LoginSession loginSession = new LoginSession(employee.id!);
        string query = $"insert into loginSession (employee_id) values (@employee_id); select
SCOPE_IDENTITY()";
        SqlCommand cmd = new SqlCommand(query, conn);

        //if the members of object are null then equivalent Db null is added in Sql
        cmd.Parameters.AddWithValue("@employee_id", employee.id);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        loginSession.id = id;
        cmd.Dispose();

        //this additional part is for getting the loggedInAt value generated automatically in sql
        query = $"select loggedInAt from loginSession where id = {loginSession.id}";
        cmd = new SqlCommand(query, conn);
        SqlDataReader reader = cmd.ExecuteReader();
        reader.Read();
        loginSession.loggedInAt = reader["loggedInAt"].ToString()!;
```

```
            reader.Close();
            cmd.Dispose();
            conn.Close();

            return loginSession;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//Employee---------->>>>
public class SqlEmployee: SqlHelper
{
    //adds a new Employee and returns Employee object with the id
    public static Employee add(Employee employee)
    {
        try
        {
            string query = $"insert into employee (salary, role, passwordHash) values (@salary, @role,
@passwordHash); select SCOPE_IDENTITY();";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@salary", employee.salary);
            cmd.Parameters.AddWithValue("@role", employee.role.ToString());
            cmd.Parameters.AddWithValue("@passwordHash", employee.passwordHash);

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            employee.id = id;
            cmd.Dispose();
            conn.Close();

            return employee;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //getAll
    public static List<Employee> getAll()
    {
        try
        {
            List<Employee> employees = new List<Employee>();
            string query = $"select * from employee;";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
```

```
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
                Employee employee = new Employee(Convert.ToDecimal(reader["salary"].ToString()),
(Role)Enum.Parse(typeof(Role), reader["role"].ToString()!), reader["passwordHash"].ToString()!);
                employee.id = reader["id"].ToString()!;
                employees.Add(employee);
            }
            cmd.Dispose();
            conn.Close();

            return employees;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //getById
    public static Employee getById(string id)
    {
        try
        {
            string query = $"select * from employee where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            Employee employee = new Employee(Convert.ToDecimal(reader["salary"].ToString()),
(Role)Enum.Parse(typeof(Role), reader["role"].ToString()!), reader["passwordHash"].ToString()!);
            employee.id = reader["id"].ToString()!;

            cmd.Dispose();
            conn.Close();

            return employee;
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //delete
    public static void delete(string id)
    {
        try
        {
            string query = $"delete from employee where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);
```

```
            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //update
    public static void update(Employee employee)
    {
        try
        {
            string query = $"update employee set salary = @salary, role = @role, passwordHash =
@passwordHash where id = @id;";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@id", employee.id);
            cmd.Parameters.AddWithValue("@salary", employee.salary);
            cmd.Parameters.AddWithValue("@role", employee.role.ToString());
            cmd.Parameters.AddWithValue("@passwordHash", employee.passwordHash);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//Supplier---------------->>>>
public class SqlSupplier: SqlHelper
{
    //adds a new Supplier and returns Supplier object with the id
    public static Supplier add(Supplier supplier)
    {
        try
        {
            string query = $"insert into supplier (email, supplier_type) values (@email, @supplier_type); select
SCOPE_IDENTITY();";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@email", supplier.email);
            cmd.Parameters.AddWithValue("@supplier_type", supplier.supplier_type.ToString());

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            supplier.id = id;
            cmd.Dispose();
            conn.Close();
```

```
            return supplier;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static List<Supplier> getAll()
    {
        try
        {
            List<Supplier> list = new List<Supplier>();
            string query = $"select * from supplier;";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
                Supplier supplier = new Supplier(reader["email"].ToString()!,
(Supplier_Type)Enum.Parse(typeof(Supplier_Type), reader["supplier_type"].ToString()!));
                supplier.id = reader["id"].ToString()!;
                list.Add(supplier);
            }

            conn.Close();
            return list;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //getById
    public static Supplier getById(string id)
    {
        try
        {
            string query = $"select * from supplier where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            Supplier supplier = new Supplier(reader["email"].ToString()!,
(Supplier_Type)Enum.Parse(typeof(Supplier_Type), reader["supplier_type"].ToString()!));
            supplier.id = reader["id"].ToString()!;

            cmd.Dispose();
            conn.Close();
```

```
            return supplier;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //delete
    public static void delete(string id)
    {
        try
        {
            string query = $"delete from supplier where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();
        }
        catch (Exception ex)
        {

            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //update
    public static void update(Supplier supplier)
    {
        try
        {
            string query = $"update supplier set email = @email, supplier_type = @supplier_type where id =
@id;";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@id", supplier.id);
            cmd.Parameters.AddWithValue("@email", supplier.email);
            cmd.Parameters.AddWithValue("@customer_type", supplier.supplier_type.ToString());

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//Customer---------->>>>
public class SqlCustomer : SqlHelper
```

```
  {
    //adds a new Customer and returns Customer object with the id
    public static Customer add(Customer customer)
    {
      try
      {
        string query = $"insert into customer (email, customer_type) values (@email, @customer_type);
select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@email", customer.email);
        cmd.Parameters.AddWithValue("@customer_type", customer.customer_type.ToString());

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        customer.id = id;
        cmd.Dispose();
        conn.Close();

        return customer;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }

    //getAll
    public static List<Customer> getAll()
    {
      try
      {
        List<Customer> customers = new List<Customer>();
        string query = $"select * from customer;";
        SqlCommand cmd = new SqlCommand(query, conn);

        conn.Open();
        SqlDataReader reader = cmd.ExecuteReader();
        while (reader.Read())
        {
          Customer customer = new Customer(reader["email"].ToString()!,
(Customer_Type)Enum.Parse(typeof(Customer_Type), reader["customer_type"].ToString()!));
          customer.id = reader["id"].ToString()!;
          customers.Add(customer);
        }
        cmd.Dispose();
        conn.Close();

        return customers;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }
```

```
    //getById
    public static Customer getById(string id)
    {
        try
        {
            string query = $"select * from customer where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            Customer customer = new Customer(reader["email"].ToString()!,
(Customer_Type)Enum.Parse(typeof(Customer_Type), reader["customer_type"].ToString()!));
            customer.id = reader["id"].ToString()!;

            cmd.Dispose();
            conn.Close();

            return customer;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //delete
    public static void delete(string id)
    {
        try
        {
            string query = $"delete from customer where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //update
    public static void update(Customer customer)
    {
        try
        {
            string query = $"update customer set email = @email, customer_type = @customer_type where id =
@id;";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@id", customer.id);
            cmd.Parameters.AddWithValue("@email", customer.email);
```

```
            cmd.Parameters.AddWithValue("@customer_type", customer.customer_type.ToString());

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }


    // make self customer
    public static void makeself()
    {
        try
        {
            string query = $"insert into customer (email, customer_type) values (@email, @customer_type);";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@email", "self@gmail.com");
            cmd.Parameters.AddWithValue("@customer_type", Customer_Type.Rich.ToString());

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static string getSelfId()
    {
        try
        {
            string query = $"select id from customer where email = 'self@gmail.com';";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
            string id = reader["id"].ToString()!;
            cmd.Dispose();
            conn.Close();

            return id;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
```

```
        }
    }
}


//Brand---------->>>>
public class SqlBrand: SqlHelper
{
    //adds a new Brand and returns Brand object with the id
    public static Brand add(Brand brand)
    {
        try
        {
            string query = $"insert into brand (title, summary, popularity) values (@title, @summary,
@popularity); select SCOPE_IDENTITY();";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@title", brand.title);
            cmd.Parameters.AddWithValue("@summary", brand.summary ?? (object)DBNull.Value);
            cmd.Parameters.AddWithValue("@popularity", brand.popularity.ToString());

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            brand.id = id;
            cmd.Dispose();
            conn.Close();

            return brand;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static List<Brand> getAll()
    {
        try
        {
            List<Brand> list = new List<Brand>();
            string query = $"select * from brand;";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
                Brand brand = new Brand(reader["title"].ToString()!, (Popularity)Enum.Parse(typeof(Popularity),
reader["popularity"].ToString()!), reader["summary"].ToString());
                brand.id = reader["id"].ToString()!;
                list.Add(brand);
            }

            conn.Close();
            return list;
        }
        catch (Exception ex)
```

```
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//User----------------->>>>
public class SqlUser : SqlHelper
{
    //adds a new User and returns User object with the id
    //1)remember to pass the appropriate employee OR customer OR supplier id. One of these is
mandatory !!!!
    //2) firstly an employee, customer OR supplier will be added then using its id this user will be created
    public static User add(User user)
    {
        //user is reserved word in sqlserver so we have to write it in [user] like this
        string query = $"insert into [user] (user_type, firstName, lastName, username, mobile, email, address,
supplier_id, customer_id, employee_id) values (@user_type, @firstName, @lastName, @username, @mobile,
@email, @address, @supplier_id, @customer_id, @employee_id); select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@user_type", user.user_type.ToString());
        cmd.Parameters.AddWithValue("@firstName", user.firstName);
        cmd.Parameters.AddWithValue("@lastName", user.lastName ?? (object)DBNull.Value);
        cmd.Parameters.AddWithValue("@username", user.username);
        cmd.Parameters.AddWithValue("@mobile", user.mobile);
        cmd.Parameters.AddWithValue("@email", user.email);
        cmd.Parameters.AddWithValue("@address", user.address);
        cmd.Parameters.AddWithValue("@supplier_id", user.supplier_id ?? (object)DBNull.Value);
        cmd.Parameters.AddWithValue("@customer_id", user.customer_id ?? (object)DBNull.Value);
        cmd.Parameters.AddWithValue("@employee_id", user.employee_id ?? (object)DBNull.Value);

        try
        {
            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            user.id = id;
            cmd.Dispose();

            //this extra work to refetch the record we added and pull the registeredAt field
            query = $"select registeredAt from [user] where id = {id}";
            cmd = new SqlCommand(query, conn);
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
            user.registeredAt = reader["registeredAt"].ToString()!;
            reader.Close();

            conn.Close();

            return user;
        }
        catch (Exception ex)
        {
            //also now delete the supplier/customer/employee created before this fun was called
            conn.Close();
            if(user.customer_id != null)
```

```
            {
                SqlCustomer.delete(user.customer_id);
            }
            else if(user.supplier_id != null)
            {
                SqlSupplier.delete(user.supplier_id);
            }
            else if (user.employee_id!= null)
            {
                SqlSupplier.delete(user.employee_id);
            }
            throw new Exception(ex.Message);
        }
    }

    //get user by employee id
    public static User getByEmployeeId(string id)
    {
        try
        {
            string query = $"select * from [user] where employee_id = {id};";

            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            User user = new User(User_Type.Employee, reader["firstName"].ToString()!,
reader["username"].ToString()!, reader["mobile"].ToString()!, reader["email"].ToString()!,
reader["address"].ToString()!, employee_id: id, lastName: reader["lastName"].ToString()!, registeredAt:
reader["registeredAt"].ToString()!);
            user.id = reader["id"].ToString()!;

            conn.Close();
            return user;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //get user by customer id
    public static User getByCustomerId(string id)
    {
        try
        {
            string query = $"select * from [user] where customer_id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
```

```
            User user = new User(User_Type.Customer, reader["firstName"].ToString()!,
reader["username"].ToString()!, reader["mobile"].ToString()!, reader["email"].ToString()!,
reader["address"].ToString()!, employee_id: id, lastName: reader["lastName"].ToString()!, registeredAt:
reader["registeredAt"].ToString()!);
            user.id = reader["id"].ToString()!;

            conn.Close();
            return user;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }


    //get user by supplier id
    public static User getBySupplierId(string id)
    {
        try
        {
            string query = $"select * from [user] where supplier_id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            User user = new User(User_Type.Supplier, reader["firstName"].ToString()!,
reader["username"].ToString()!, reader["mobile"].ToString()!, reader["email"].ToString()!,
reader["address"].ToString()!, employee_id: id, lastName: reader["lastName"].ToString()!, registeredAt:
reader["registeredAt"].ToString()!);
            user.id = reader["id"].ToString()!;

            conn.Close();
            return user;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //get user by id
    public static User getById(string id)
    {
        try
        {
            string query = $"select * from [user] where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
```

```
            User user = new User(User_Type.Supplier, reader["firstName"].ToString()!,
reader["username"].ToString()!, reader["mobile"].ToString()!, reader["email"].ToString()!,
reader["address"].ToString()!, customer_id: reader["customer_id"].ToString(), lastName:
reader["lastName"].ToString()!, registeredAt: reader["registeredAt"].ToString()!);
            user.id = reader["id"].ToString()!;

            conn.Close();
            return user;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //updateByCustomerId
    public static void updateByCustomerId(User user)
    {
        try
        {
            // user is a reserved keyword in SQL Server, so using [user] to avoid syntax issues
            string query = $"update [user] set user_type = @user_type, firstName = @firstName, lastName =
@lastName, username = @username, mobile = @mobile, email = @email, address = @address where
customer_id = @customer_id;";
            SqlCommand cmd = new SqlCommand(query, conn);

            cmd.Parameters.AddWithValue("@user_type", user.user_type.ToString());
            cmd.Parameters.AddWithValue("@firstName", user.firstName);
            cmd.Parameters.AddWithValue("@lastName", user.lastName ?? (object)DBNull.Value);
            cmd.Parameters.AddWithValue("@username", user.username);
            cmd.Parameters.AddWithValue("@mobile", user.mobile);
            cmd.Parameters.AddWithValue("@email", user.email);
            cmd.Parameters.AddWithValue("@address", user.address);
            cmd.Parameters.AddWithValue("@customer_id", user.customer_id);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //updateByEmployeeId
    public static void updateByEmployeeId(User user)
    {
        try
        {
            // user is a reserved keyword in SQL Server, so using [user] to avoid syntax issues
            string query = $"update [user] set user_type = @user_type, firstName = @firstName, lastName =
@lastName, username = @username, mobile = @mobile, email = @email, address = @address where
employee_id = @employee_id;";
```

```
            SqlCommand cmd = new SqlCommand(query, conn);

            cmd.Parameters.AddWithValue("@user_type", user.user_type.ToString());
            cmd.Parameters.AddWithValue("@firstName", user.firstName);
            cmd.Parameters.AddWithValue("@lastName", user.lastName ?? (object)DBNull.Value);
            cmd.Parameters.AddWithValue("@username", user.username);
            cmd.Parameters.AddWithValue("@mobile", user.mobile);
            cmd.Parameters.AddWithValue("@email", user.email);
            cmd.Parameters.AddWithValue("@address", user.address);
            cmd.Parameters.AddWithValue("@employee_id", user.employee_id);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }


    //updateBySupplierId
    public static void updateBySupplierId(User user)
    {
        try
        {
            // user is a reserved keyword in SQL Server, so using [user] to avoid syntax issues
            string query = $"update [user] set user_type = @user_type, firstName = @firstName, lastName =
@lastName, username = @username, mobile = @mobile, email = @email, address = @address where
supplier_id = @supplier_id;";
            SqlCommand cmd = new SqlCommand(query, conn);

            cmd.Parameters.AddWithValue("@user_type", user.user_type.ToString());
            cmd.Parameters.AddWithValue("@firstName", user.firstName);
            cmd.Parameters.AddWithValue("@lastName", user.lastName ?? (object)DBNull.Value);
            cmd.Parameters.AddWithValue("@username", user.username);
            cmd.Parameters.AddWithValue("@mobile", user.mobile);
            cmd.Parameters.AddWithValue("@email", user.email);
            cmd.Parameters.AddWithValue("@address", user.address);
            cmd.Parameters.AddWithValue("@supplier_id ", user.supplier_id);

            conn.Open();
            cmd.ExecuteNonQuery();
            cmd.Dispose();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
  }
```

```
  //Order---------------->>>>
  public class SqlOrder : SqlHelper
  {
    //adds a new Order and returns Order object with the id
    //1) A user (customer (selling to)/supplier (buying from)) AND an employee (who is processing the order)
AND type(in/out) are needed for Order
    public static Order add(Order order)
    {
      try
      {
        //user is reserved word in sqlserver so we have to write it in [user] like this
        string query = $"insert into [order] (user_id, employee_id, type, subTotal, tax, total) values (@user_id,
@employee_id, @type, @subTotal, @tax, @total); select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@user_id", order.user_id);
        cmd.Parameters.AddWithValue("@employee_id", order.employee_id);
        cmd.Parameters.AddWithValue("@type", order.type.ToString());
        cmd.Parameters.AddWithValue("@subTotal", order.subTotal);
        cmd.Parameters.AddWithValue("@tax", order.tax);
        cmd.Parameters.AddWithValue("@total", order.total);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        order.id = id;
        cmd.Dispose();
        conn.Close();

        return order;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }

    //getAll
    public static List<Order> getAll()
    {
      try
      {
        List<Order> list = new List<Order>();
        string query = $"select * from [order];";
        SqlCommand cmd = new SqlCommand(query, conn);

        conn.Open();
        SqlDataReader reader = cmd.ExecuteReader();

        while (reader.Read())
        {
          Order order = new Order(reader["user_id"].ToString()!, reader["employee_id"].ToString()!,
(DataModels.Type)Enum.Parse(typeof(DataModels.Type), reader["type"].ToString()!),
Convert.ToDecimal(reader["subTotal"].ToString()), Convert.ToDecimal(reader["tax"].ToString()),
Convert.ToDecimal(reader["total"].ToString()));
          order.id = reader["id"].ToString()!;
          list.Add(order);
        }
```

```
            cmd.Dispose();
            conn.Close();

            return list;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
}


//Payment---------------->>>>
public class SqlPayment : SqlHelper
{
    //adds a new Payment and returns Payment object with the id and createdAt
    //1) A Order, User and ShippingAddress is needed for Payment object
    public static Payment add(Payment payment)
    {
        try
        {
            string query = $"insert into payment (user_id, order_id, shippintAddress_id, mode, status, type)
values (@user_id, @order_id, @shippintAddress_id, @mode, @status, @type); select SCOPE_IDENTITY();";
            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@user_id", payment.user_id);
            cmd.Parameters.AddWithValue("@order_id", payment.order_id);
            cmd.Parameters.AddWithValue("@shippintAddress_id", payment.shippingAddress_id);
            cmd.Parameters.AddWithValue("@mode", payment.mode.ToString());
            cmd.Parameters.AddWithValue("@status", payment.status.ToString());
            cmd.Parameters.AddWithValue("@type", payment.type.ToString());

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            payment.id = id;

            //this extra work to refetch the record we added and pull the createdAt field
            query = $"select createdAt from payment where id = {id}";
            cmd = new SqlCommand(query, conn);
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
            payment.createdAt = reader["createdAt"].ToString()!;

            reader.Close();
            conn.Close();

            return payment;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
```

```
    //Update
    public static Payment update(Payment payment)
    {
        try
        {
            string query = "update payment set user_id = @user_id, order_id = @order_id, shippingAddress_id =
@shippingAddress_id, mode = @mode, status = @status, type = @type where id = @id;";
            SqlCommand cmd = new SqlCommand(query, conn);

            // Set up parameters for the SQL command
            cmd.Parameters.AddWithValue("@user_id", payment.user_id);
            cmd.Parameters.AddWithValue("@order_id", payment.order_id);
            cmd.Parameters.AddWithValue("@shippingAddress_id", payment.shippingAddress_id);
            cmd.Parameters.AddWithValue("@mode", payment.mode);
            cmd.Parameters.AddWithValue("@status", payment.status);
            cmd.Parameters.AddWithValue("@type", payment.type);
            cmd.Parameters.AddWithValue("@id", payment.id);

            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();

            // Re-fetch the updated record's createdAt field, in case it was modified or for consistency
            query = "select createdAt from payment where id = @id";
            cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@id", payment.id);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            if (reader.Read())
            {
                payment.createdAt = reader["createdAt"].ToString()!;
            }

            reader.Close();
            conn.Close();

            return payment;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static Payment getByOrderId(string order_id)
    {
        try
        {
            string query = $"select * from payment where order_id = {order_id};";
            SqlCommand cmd = new SqlCommand(query, conn);
            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();
```

```
            Payment payment = new Payment(reader["user_id"].ToString()!, reader["order_id"].ToString()!,
reader["shippintAddress_id"].ToString()!, (Mode)Enum.Parse(typeof(Mode), reader["mode"].ToString()!),
(Status)Enum.Parse(typeof(Status), reader["status"].ToString()!),
(DataModels.Type)Enum.Parse(typeof(DataModels.Type), reader["type"].ToString()!), createdAt:
reader["createdAt"].ToString());
            payment.id = reader["id"].ToString()!;

            reader.Close();
            conn.Close();

            return payment;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
  }


  //Product---------------->>>>
  public class SqlProduct : SqlHelper
  {
    //adds a new Product and returns Product object with the id and createdAt
    public static Product add(Product product)
    {
      try
      {
        string query = $"insert into product (title, description) values (@title, @description); select
SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@title", product.title);
        cmd.Parameters.AddWithValue("@description", product.description ?? (object)DBNull.Value);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        product.id = id;

        //this extra work to refetch the record we added and pull the createdAt field
        query = $"select createdAt from product where id = {id}";
        cmd = new SqlCommand(query, conn);
        SqlDataReader reader = cmd.ExecuteReader();
        reader.Read();
        product.createdAt = reader["createdAt"].ToString()!;

        reader.Close();
        conn.Close();

        return product;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }
```

```
//getAll
public static List<Product> getAll()
{
   try
   {
      List<Product> list = new List<Product>();
      string query = $"select * from product;";
      SqlCommand cmd = new SqlCommand(query, conn);

      conn.Open();
      SqlDataReader reader = cmd.ExecuteReader();
      while (reader.Read())
      {
         Product product = new Product(reader["title"].ToString()!, reader["description"].ToString()!);
         product.createdAt = reader["createdAt"].ToString();
         product.id = reader["id"].ToString()!;
         list.Add(product);
      }

      conn.Close();
      return list;
   }
   catch (Exception ex)
   {
      conn.Close();
      throw new Exception(ex.Message);
   }
}

//getById
public static Product getById(string id)
{
   try
   {
      string query = $"select * from product where id = {id};";
      SqlCommand cmd = new SqlCommand(query, conn);

      conn.Open();
      SqlDataReader reader = cmd.ExecuteReader();
      reader.Read();

      Product product = new Product(reader["title"].ToString()!, reader["description"].ToString()!);
      product.createdAt = reader["createdAt"].ToString();
      product.id = reader["id"].ToString()!;

      conn.Close();
      return product;
   }
   catch (Exception ex)
   {
      conn.Close();
      throw new Exception(ex.Message);
   }
}

//delete
```

```
    public static void delete(string id)
    {
      try
      {
        string query = $"delete from product where id = {id}";
        SqlCommand cmd = new SqlCommand(query, conn);

        conn.Open();
        cmd.ExecuteNonQuery();
        conn.Close();
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }

    //update
    public static void update(Product product)
    {
      try
      {
        string query = $"update product set title = @title, description = @description where id = @id;";
        SqlCommand cmd = new SqlCommand(query, conn);

        cmd.Parameters.AddWithValue("@title", product.title);
        cmd.Parameters.AddWithValue("@description", product.description ?? (object)DBNull.Value);
        cmd.Parameters.AddWithValue("@id", product.id);

        conn.Open();
        cmd.ExecuteNonQuery();
        conn.Close();
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }

    }
  }


  //Order_Item---------->>>>
  public class SqlOrder_Item : SqlHelper
  {
    //adds a new Order_Item and returns Order_Item object with the id
    //product, Item and order are needed for this
    public static Order_Item add(Order_Item order_Item)
    {
      try
      {
        string query = $"insert into order_item (product_id, item_id, order_id, price, quantitiy, total_price)
values (@product_id, @item_id, @order_id, @price, @quantitiy, @total_price); select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@product_id", order_Item.product_id);
```

```
            cmd.Parameters.AddWithValue("@item_id", order_Item.item_id);
            cmd.Parameters.AddWithValue("@order_id", order_Item.order_id);
            cmd.Parameters.AddWithValue("@price", order_Item.price);
            cmd.Parameters.AddWithValue("@quantitiy", order_Item.quantity);
            cmd.Parameters.AddWithValue("@total_price", order_Item.total_price);

            conn.Open();
            string id = cmd.ExecuteScalar().ToString()!;
            order_Item.id = id;
            conn.Close();

            return order_Item;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
  }


  //Product_Category---------->>>>
  public class SqlProduct_Category : SqlHelper
  {
    //adds a new Product_Category and returns Product_Category object with the id
    //category and product are needed for this
    public static Product_Category add(Product_Category product_Category)
    {
      try
      {
        string query = $"insert into product_category (category_id, product_id) values (@category_id,
@product_id); select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@category_id", product_Category.category_id);
        cmd.Parameters.AddWithValue("@product_id", product_Category.product_id);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        product_Category.id = id;
        conn.Close();

        return product_Category;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }
  }


  //Category---------->>>>
  public class SqlCategory : SqlHelper
  {
    //adds a new Category and returns Category object with the id
```

```
    public static Category add(Category category)
    {
      try
      {
        string query = $"insert into category (title, description) values (@title, @description); select
SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@title", category.title);
        cmd.Parameters.AddWithValue("@description", category.description);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        category.id = id;
        conn.Close();

        return category;
      }
      catch (Exception ex)
      {
        conn.Close();
        throw new Exception(ex.Message);
      }
    }
  }


  //Item---------->>>>
  public class SqlItem : SqlHelper
  {
    //adds a new Item and returns Item object with the id
    public static Item add(Item item)
    {
      try
      {
        string query = $"insert into item (product_id, brand_id, supplier_id, price, discount, quantity,
stockValue, alarm_quantity) values (@product_id, @brand_id, @supplier_id, @price, @discount, @quantity,
@stockValue, @alarm_quantity); select SCOPE_IDENTITY();";
        SqlCommand cmd = new SqlCommand(query, conn);
        cmd.Parameters.AddWithValue("@product_id", item.product_id);
        cmd.Parameters.AddWithValue("@brand_id", item.brand_id);
        cmd.Parameters.AddWithValue("@supplier_id", item.supplier_id);
        cmd.Parameters.AddWithValue("@price", item.price);
        cmd.Parameters.AddWithValue("@discount", item.discount);
        cmd.Parameters.AddWithValue("@quantity", item.quantity);
        cmd.Parameters.AddWithValue("@stockValue", item.stockValue);
        cmd.Parameters.AddWithValue("@alarm_quantity", item.alarm_quantity);

        conn.Open();
        string id = cmd.ExecuteScalar().ToString()!;
        item.id = id;
        conn.Close();

        return item;
      }
      catch (Exception ex)
      {
        conn.Close();
```

```
            throw new Exception(ex.Message);
        }
    }

    //getAll
    public static List<Item> getAll()
    {
        try
        {
            List<Item> list = new List<Item>();
            string query = $"select * from item;";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            while (reader.Read())
            {
                Item item = new Item(reader["product_id"].ToString()!, reader["brand_id"].ToString()!,
reader["supplier_id"].ToString()!, Convert.ToDecimal(reader["price"].ToString()),
Convert.ToInt32(reader["discount"].ToString()), Convert.ToInt32(reader["quantity"].ToString()),
Convert.ToDecimal(reader["stockValue"].ToString()), Convert.ToInt64(reader["alarm_quantity"].ToString()));
                item.id = reader["id"].ToString()!;
                list.Add(item);
            }

            conn.Close();
            return list;
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    public static Item getById(string id)
    {
        try
        {
            string query = $"select * from item where id = {id};";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            SqlDataReader reader = cmd.ExecuteReader();
            reader.Read();

            Item item = new Item(reader["product_id"].ToString()!, reader["brand_id"].ToString()!,
reader["supplier_id"].ToString()!, Convert.ToDecimal(reader["price"].ToString()),
Convert.ToInt32(reader["discount"].ToString()), Convert.ToInt32(reader["quantity"].ToString()),
Convert.ToDecimal(reader["stockValue"].ToString()), Convert.ToInt64(reader["alarm_quantity"].ToString()));
            item.id = reader["id"].ToString()!;

            conn.Close();
            return item;
        }
        catch (Exception ex)
        {
```

```
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //delete
    public static void delete(string id)
    {
        try
        {
            string query = $"delete from item where id = {id}";
            SqlCommand cmd = new SqlCommand(query, conn);

            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();
        }
        catch (Exception ex)
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }

    //update
    public static void update(Item item)
    {
        try
        {
            string query = @"update item
                set product_id = @product_id,
                    brand_id = @brand_id,
                    supplier_id = @supplier_id,
                    price = @price,
                    discount = @discount,
                    quantity = @quantity,
                    stockValue = @stockValue,
                    alarm_quantity = @alarm_quantity
                where id = @id";

            SqlCommand cmd = new SqlCommand(query, conn);
            cmd.Parameters.AddWithValue("@product_id", item.product_id);
            cmd.Parameters.AddWithValue("@brand_id", item.brand_id);
            cmd.Parameters.AddWithValue("@supplier_id", item.supplier_id);
            cmd.Parameters.AddWithValue("@price", item.price);
            cmd.Parameters.AddWithValue("@discount", item.discount);
            cmd.Parameters.AddWithValue("@quantity", item.quantity);
            cmd.Parameters.AddWithValue("@stockValue", item.stockValue);
            cmd.Parameters.AddWithValue("@alarm_quantity", item.alarm_quantity);
            cmd.Parameters.AddWithValue("@id", item.id);  // Make sure item.id has the correct ID for the
update

            conn.Open();
            cmd.ExecuteNonQuery();
            conn.Close();
        }
        catch (Exception ex)
```

```
        {
            conn.Close();
            throw new Exception(ex.Message);
        }
    }
  }
}
```

IMS MAIN
FORM1.CS

```
using DataModels;
using DataAccessLayer;

namespace IMS_Main
{
  public partial class Dashboard : Form
  {
    //"admin" means admin else there will be employee id in this variable
    public string loggedInAs;
    public Dashboard(string loggedInAs)
    {
      InitializeComponent();

      this.loggedInAs = loggedInAs;
      //first the dashboard should appear
      controlDashboard1.refreshProfit();
      controlDashboard1.refreshBestCustomer();
      controlDashboard1.refreshUserCount();
      controlDashboard1.refreshBiggestOrderValue();
      controlDashboard1.refreshInventoryOnAlarmQuantity();
      controlDashboard1.refreshDate();
      controlDashboard1.BringToFront();

      button4.Text = "Orders";
    }

    private void button5_Click(object sender, EventArgs e)
    {
      label2.Text = "Dashboard";

      controlDashboard1.refreshProfit();
      controlDashboard1.refreshBestCustomer();
      controlDashboard1.refreshUserCount();
      controlDashboard1.refreshBiggestOrderValue();
      controlDashboard1.refreshInventoryOnAlarmQuantity();
      controlDashboard1.refreshDate();
      controlDashboard1.BringToFront();
    }

    private void button1_Click(object sender, EventArgs e)
    {
      label2.Text = "Inventory";

      controlinventory1.Controlinventory_Load(sender, e);
```

```
        controlinventory1.BringToFront();
    }

    private void button2_Click(object sender, EventArgs e)
    {
        label2.Text = "Products";

        controlProducts1.BringToFront();
    }

    private void button3_Click(object sender, EventArgs e)
    {
        label2.Text = "Users";

        controlUsers1.BringToFront();
    }

    private void button4_Click(object sender, EventArgs e)
    {
        label2.Text = "Orders";
        controlTransactions1.ControlTransactions_Load(sender, e);
        controlTransactions1.BringToFront();
    }

    private void Dashboard_Load(object sender, EventArgs e)
    {
        //setting the name of logged in Employee or Admin
        if(loggedInAs == "admin")
        {
            label3.Text = "Admin";
        }
        else
        {
            label3.Text = SqlUser.getByEmployeeId(loggedInAs).firstName;
        }

        //default self customer add
        List<Customer> customers = SqlCustomer.getAll();
        bool flag = false;
        foreach (Customer customer in customers)
        {
            if (customer.email == "self@gmail.com")
            {
                flag = true;
                break;
            }
        }
        if (flag == false)
        {
            //else create one
            SqlCustomer.makeself();
            User user = SqlUser.add(new User(User_Type.Customer, "self", "self", "9999999999",
"self@gmail.com", "self", customer_id: SqlCustomer.getSelfId()));
        }
        flag = false;

        //its shipping address also
```

```
        List<ShippingAddress> shippingAddresses = SqlShippingAddress.getAll();
        foreach (ShippingAddress shippingAddresse in shippingAddresses)
        {
          if (shippingAddresse.customer_id == SqlCustomer.getSelfId())
          {
            flag = true;
            break;
          }
        }
        if(flag == false)
        {
          SqlShippingAddress.makeSelf();
        }
      }
    }
}
```

LOGIN FORM

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace IMS_Main
{
  public partial class LoginForm : Form
  {
    public static string loggedInAs;
    Captcha captcha;
    public LoginForm()
    {
      InitializeComponent();
      captcha = SqlCaptcha.fetchRandomCaptcha(SqlCaptcha.fetchNoOfCaptchas());
      pictureBox1.Image = Image.FromFile(captcha.Path);
    }

    public void refreshForm()
    {
      captcha = SqlCaptcha.fetchRandomCaptcha(SqlCaptcha.fetchNoOfCaptchas());
      pictureBox1.Image = Image.FromFile(captcha.Path);
      textBox1.Clear();
      textBox2.Clear();
      textBox3.Clear();
      textBox4.Clear();
      textBox5.Clear();
    }

    //Admin Login
    private void button1_Click(object sender, EventArgs e)
```

```
{
    if(textBox1.Text == "" || textBox2.Text == "" || textBox3.Text == "")
    {
        label8.Text = "Fill All Details First";
        label8.Visible = true;
        return;
    }

    string userCaptcha = textBox1.Text;
    if (userCaptcha != captcha.Text)
    {
        label8.Text = "Wrong Captcha Text";
        label8.Visible = true;
        refreshForm();
        return;
    }

    if (textBox2.Text != "admin" || textBox3.Text != "123")
    {
        label8.Text = "Wrong Credentials";
        label8.Visible = true;
        refreshForm();
        return;
    }

    Dashboard mainForm = new Dashboard("admin");
    loggedInAs = "admin";
    mainForm.ShowDialog();
    this.Close();
}

//Employee Login
private void button2_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "" || textBox4.Text == "" || textBox5.Text == "")
    {
        label8.Text = "Fill All Details First";
        label8.Visible = true;
        return;
    }

    string userCaptcha = textBox1.Text;
    if (userCaptcha != captcha.Text)
    {
        label8.Text = "Wrong Captcha Text";
        label8.Visible = true;
        refreshForm();
        return;
    }

    List<Employee> employees = SqlEmployee.getAll();
    foreach (Employee employee in employees)
    {
        User user = SqlUser.getByEmployeeId(employee.id!);
        if(textBox5.Text == user.username)
        {
            if(textBox4.Text == employee.passwordHash)
```

```
            {
                Dashboard mainForm = new Dashboard(employee.id!);
                loggedInAs = employee.id!;
                mainForm.ShowDialog();
                this.Close();
            }
        }
    }

    label8.Text = "Wrong Credentials";
    label8.Visible = true;
    refreshForm();
  }
 }
}
```

CONTROL DASHBOARD

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace IMS_Main
{
  public partial class ControlDashboard : UserControl
  {
    public ControlDashboard()
    {
      InitializeComponent();
      refreshProfit();
      refreshBestCustomer();
      refreshUserCount();
      refreshBiggestOrderValue();
      refreshInventoryOnAlarmQuantity();
      refreshDate();
    }

    public void refreshProfit()
    {
      decimal profit = 0;
      List<Order> orders = SqlOrder.getAll();
      foreach (Order order in orders)
      {
        if(order.type == DataModels.Type.Out)
        {
          profit += order.total;
        }
      }
      label3.Text = $"Rs {profit}";
```

```
}

public void refreshBestCustomer()
{
   label7.Text = "Not Known Yet";
   List<Order> orders = SqlOrder.getAll();
   if (orders.Count > 0)
   {
      decimal value = 0;
      Order? biggestOrder = null;
      foreach (Order order in orders)
      {
         if(order.type == DataModels.Type.Out && order.total > value)
         {
            biggestOrder = order;
            value = order.total;
         }
      }
      if (biggestOrder != null)
      {
         User user = SqlUser.getById(biggestOrder.user_id);
         label7.Text = $"{user.firstName} {user.lastName}";
      }
   }
}

public void refreshUserCount()
{
   List<Customer> customers = SqlCustomer.getAll();
   List<Supplier> suppliers = SqlSupplier.getAll();
   List<Employee> employees = SqlEmployee.getAll();

   label11.Text = customers.Count.ToString();
   label12.Text = suppliers.Count.ToString();
   label13.Text = employees.Count.ToString();
}

public void refreshBiggestOrderValue()
{
   label1.Text = "Rs 0";
   List<Order> orders = SqlOrder.getAll();
   if (orders.Count > 0)
   {
      decimal value = 0;
      Order? biggestOrder = null;
      foreach (Order order in orders)
      {
         if (order.type == DataModels.Type.Out && order.total > value)
         {
            biggestOrder = order;
            value = order.total;
         }
      }
      if (biggestOrder != null)
      {
         label1.Text = $"Rs {biggestOrder.total}";
      }
```

```
        }
    }

    public void refreshInventoryOnAlarmQuantity()
    {
        List<Item> items = SqlItem.getAll();
        List<Item> alarmList = new List<Item>();

        foreach (Item it in items)
        {
          if(it.quantity <= it.alarm_quantity)
          {
             alarmList.Add(it);
          }
        }
        dataGridView1.DataSource = alarmList;
    }

    public void refreshDate()
    {
        DateTime today = DateTime.Today;
        label5.Text = today.ToString("d");
    }
  }
}
```

CONTROL INVENTORY

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Runtime.CompilerServices;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace IMS_Main
{
  public partial class Controlinventory : UserControl
  {
    List<Item> items;
    Item? item;
    public Controlinventory()
    {
      InitializeComponent();
    }

    //initial fetch to load data
    public void Controlinventory_Load(object sender, EventArgs e)
    {
      comboBox1.Items.Clear();
      //comboBox2.Items.Clear();
```

```
        comboBox3.Items.Clear();

        items = SqlItem.getAll();
        this.BackColor = Color.FromArgb(12, 0, 50); //had to do this coz it wasn't changing from ui settings
        dataGridView1.DataSource = items;
        //List<Brand> brands = SqlBrand.getAll();
        List<Product> products = SqlProduct.getAll();
        List<Supplier> suppliers = SqlSupplier.getAll();
        foreach (var item in products)
        {
            comboBox1.Items.Add(item);
        }
        //foreach (var item in brands)
        //{
        //    comboBox2.Items.Add(item.id!);
        //}
        foreach (var item in suppliers)
        {
            comboBox3.Items.Add(item);
        }
    }

    //when a row is selected
    private void dataGridView1_CellContentClick(object sender, DataGridViewCellEventArgs e)
    {
        // Check if the row index is valid (e.g., avoid header row clicks)
        if (e.RowIndex >= 0)
        {
            // Get the clicked row
            DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

            textBox1.Text = SqlProduct.getById(selectedRow.Cells[0].Value.ToString()!).ToString(); // Value of the
first cell
            comboBox1.Text = selectedRow.Cells[1].Value.ToString();
            //comboBox2.Text = selectedRow.Cells[2].Value.ToString();
            comboBox3.Text = SqlSupplier.getById(selectedRow.Cells[3].Value.ToString()!).ToString();
            textBox8.Text = selectedRow.Cells[4].Value.ToString();
            textBox7.Text = selectedRow.Cells[5].Value.ToString();
            textBox6.Text = selectedRow.Cells[6].Value.ToString();
            textBox5.Text = selectedRow.Cells[7].Value.ToString();
            textBox9.Text = selectedRow.Cells[8].Value.ToString();
        }
    }

    //Delete
    private void button3_Click(object sender, EventArgs e)
    {
        if (textBox1.Text == "" || comboBox1.Text == "" || comboBox3.Text == "") return;
        try
        {
            SqlItem.delete(textBox1.Text);
            MessageBox.Show("Item deleted");
            //refresh grid
            items = SqlItem.getAll();
            dataGridView1.DataSource = items;
        }
        catch(Exception ex)
```

```
        {
          label10.Text = ex.Message;
        }

      }

      //Add
      private void button1_Click(object sender, EventArgs e)
      {
        try
        {
        if (textBox8.Text == "" || comboBox1.Text == "" || comboBox3.Text == "") return;

        Item item = new Item(comboBox1.Text[0].ToString(), "1", comboBox3.Text[0].ToString(),
Convert.ToDecimal(textBox8.Text), Convert.ToInt32(textBox7.Text), Convert.ToInt32(textBox6.Text),
Convert.ToDecimal(textBox5.Text), Convert.ToInt64(textBox9.Text));

          SqlItem.add(item);
          Controlinventory_Load(sender, e); //reloads OR refreshes not working
          items = SqlItem.getAll();
          dataGridView1.DataSource = items;
        }
        catch (Exception ex)
        {
          label11.Text = ex.Message;
        }
      }

      //update
      private void button2_Click(object sender, EventArgs e)
      {
        if (textBox1.Text == "" || comboBox1.Text == "" || comboBox3.Text == "") return;

        Item item = new Item(comboBox1.Text[0].ToString(), "1", comboBox3.Text[0].ToString(),
Convert.ToDecimal(textBox8.Text), Convert.ToInt32(textBox7.Text), Convert.ToInt32(textBox6.Text),
Convert.ToDecimal(textBox5.Text), Convert.ToInt64(textBox9.Text));
        item.id = textBox1.Text;

        try
        {
          SqlItem.update(item);
          //refreshing
          items = SqlItem.getAll();
          dataGridView1.DataSource = items;
          MessageBox.Show("Item Updated Successfully");
        }
        catch (Exception ex)
        {
          label10.Text = ex.Message;
        }
      }
    }
}
```

CONTROL PRODUCTS

```
using DataAccessLayer;
```

```
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using static System.Windows.Forms.VisualStyles.VisualStyleElement;

namespace IMS_Main
{
   public partial class ControlProducts : UserControl
   {
      List<Product> products;
      public ControlProducts()
      {
         InitializeComponent();
         products = SqlProduct.getAll();
      }

      private void ControlProducts_Load(object sender, EventArgs e)
      {
         dataGridView1.DataSource = products;
      }

      private void dataGridView1_CellContentClick(object sender, DataGridViewCellEventArgs e)
      {
         // Check if the row index is valid (e.g., avoid header row clicks)
         if (e.RowIndex >= 0)
         {
            // Get the clicked row
            DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

            textBox1.Text = selectedRow.Cells[0].Value.ToString(); // Value of the first cell
            textBox8.Text = selectedRow.Cells[1].Value.ToString();
            richTextBox1.Text = selectedRow.Cells[2].Value.ToString();
            richTextBox2.Text = selectedRow.Cells[3].Value.ToString();
         }
      }

      //add
      private void button1_Click(object sender, EventArgs e)
      {
         if (textBox8.Text == "") return;

         Product product = new Product(textBox8.Text, richTextBox1.Text);

         try
         {
            product = SqlProduct.add(product);
            products = SqlProduct.getAll();
            dataGridView1.DataSource = products;
            MessageBox.Show($"Product added with id: {product.id}");
         }
```

```
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }

    //Delete
    private void button3_Click(object sender, EventArgs e)
    {
        if (textBox1.Text == "") return;
        try
        {
            SqlProduct.delete(textBox1.Text);
            MessageBox.Show("Item deleted");
            //refresh grid
            products = SqlProduct.getAll();
            dataGridView1.DataSource = products;
        }
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }

    //update
    private void button2_Click(object sender, EventArgs e)
    {
        if (textBox1.Text == "") return;

        Product product = new Product(textBox8.Text, richTextBox1.Text);
        product.id = textBox1.Text;

        try
        {
            SqlProduct.update(product);
            //refreshing
            products = SqlProduct.getAll();
            dataGridView1.DataSource = products;
            MessageBox.Show("Item Updated Successfully");
        }
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }
  }
}
```

CONTROL ORDERS

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
```

```
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

namespace IMS_Main
{
   public partial class ControlTransactions : UserControl
   {
      private List<Order> orders;
      private Item? item = null; //this is the item selected from the list
      List<Item> items = SqlItem.getAll(); //initial list to show available items to users

      //binding list automatically updated UIs like listbox if its datasource is set to this bindinglist
      private BindingList<UserItem> userItems = new BindingList<UserItem>(); //this is displayed on listBox
whatever user has added
      public ControlTransactions()
      {
         InitializeComponent();
      }

      public void ControlTransactions_Load(object sender, EventArgs e)
      {
         //fill comboboxes with values
         comboBox3.DataSource = Enum.GetValues(typeof(DataModels.Type));
         List<Item> items = SqlItem.getAll();
         comboBox1.Items.Clear();
         foreach (var item in items)
         {
            comboBox1.Items.Add(item.id!);
         }
         listBox1.DataSource = userItems;
         comboBox5.DataSource = SqlEmployee.getAll();

         //dataGridView filling
         refreshOrderData();
      }

      private void refreshOrderData()
      {
         // Set up columns for selective properties if not already done
         dataGridView1.Columns.Clear(); // Clear existing columns if needed

         // Add columns for selective properties
         dataGridView1.Columns.Add("order_id", "order_id");
         dataGridView1.Columns.Add("customer_id", "customer_id");
         dataGridView1.Columns.Add("type", "type");
         dataGridView1.Columns.Add("total", "total");
         dataGridView1.Columns.Add("shippingAddress", "shippingAddress");
         dataGridView1.Columns.Add("createdAt", "createdAt");

         orders = SqlOrder.getAll();
         foreach (Order order in orders)
         {
            User user = SqlUser.getById(order.user_id!);
            Payment payment = SqlPayment.getByOrderId(order.id!);
            ShippingAddress shippingAddress = SqlShippingAddress.getById(payment.shippingAddress_id);
```

```
            dataGridView1.Rows.Add(order.id, user.customer_id!, payment.type.ToString(), order.total,
$"{shippingAddress.city}, {shippingAddress.state}, {shippingAddress.country}", payment.createdAt);
        }
    }

    //type In/Out
    private void comboBox3_SelectedIndexChanged(object sender, EventArgs e)
    {
        if (comboBox3.Text == "") return;
        if (comboBox3.Text == "In")
        {
            comboBox2.Text = "self";
            comboBox4.Text = "self";
            comboBox2.Enabled = false;
            comboBox4.Enabled = false;
        }
        else if (comboBox3.Text == "Out")
        {
            comboBox2.Enabled = true;
            comboBox4.Enabled = true;
            comboBox2.DataSource = SqlCustomer.getAll();
        }
    }

    //when customer is selected so show all his shipping addresses
    private void comboBox2_SelectedIndexChanged(object sender, EventArgs e)
    {
        if (comboBox2.Text == "") return;
        comboBox4.DataSource = SqlShippingAddress.getMany(comboBox2.Text[0].ToString());
    }

    //when item is selected then fetch its price
    private void comboBox1_SelectedIndexChanged(object sender, EventArgs e)
    {
        if (comboBox1.Text == "") return;
        item = getItemFromMyItemList(comboBox1.Text);
        textBox2.Text = item.price.ToString();
    }

    //when add item button is clicked
    private void button3_Click(object sender, EventArgs e)
    {
        try
        {
            if (item == null) return;
            int quantity = Convert.ToInt32(maskedTextBox1.Text);
            if (quantity > item!.quantity) throw new Exception("Not enough quantity in Inventory");

            UserItem userItem = new UserItem(item.product_id, item.id!, item.price.ToString(),
maskedTextBox1.Text, textBox3.Text);
            userItems.Add(userItem);
            item.quantity -= quantity;
        }
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
```

```
    }

    //when remove item is clicked
    private void button2_Click(object sender, EventArgs e)
    {
      if (listBox1.SelectedItem == null) return;
      UserItem userItem = (UserItem)listBox1.SelectedItem;
      userItems.Remove(userItem);

      item = getItemFromMyItemList(userItem.item_id);
      item.quantity += Convert.ToInt32(userItem.quantity);
    }

    //when quantity is changed
    private void maskedTextBox1_TextChanged(object sender, EventArgs e)
    {
      try
      {
        if (maskedTextBox1.Text == "")
        {
          textBox3.Text = "";
          return;
        }
        decimal quantity = Convert.ToDecimal(maskedTextBox1.Text);
        if (quantity <= 0) throw new Exception("Quanitiy should be at least 1");
        decimal price = Convert.ToDecimal(textBox2.Text);
        textBox3.Text = (quantity * price).ToString();
      }
      catch (Exception ex)
      {
        label11.Text = ex.Message;
      }
    }


    //extra utility function
    public Item getItemFromMyItemList(string id)
    {
      foreach (Item myItem in items)
      {
        if (myItem.id == id) return myItem;
      }
      return items[0]; //you will never know why I wrote this line XD (it will never even execute lol)
    }

    //Add Order
    private void button1_Click(object sender, EventArgs e)
    {
      try
      {
        if (listBox1.Items.Count == 0 || comboBox2.Text == "" || comboBox3.Text == "" || comboBox4.Text
== "" || comboBox5.Text == "") return;
          User user;
          Payment payment;
          Order order;
          if (comboBox3.Text == "In")
          {
```

```
                user = SqlUser.getByCustomerId(SqlCustomer.getSelfId());
                order = new Order(user.id!, comboBox5.Text[0].ToString(),
(DataModels.Type)Enum.Parse(typeof(DataModels.Type), comboBox3.Text),
Convert.ToDecimal(textBox3.Text), 0, Convert.ToDecimal(textBox3.Text));
                order = SqlOrder.add(order);
                payment = new Payment(user.id!, order.id!, SqlShippingAddress.getSelfId(), Mode.Online,
Status.Finished, (DataModels.Type)Enum.Parse(typeof(DataModels.Type), comboBox3.Text));
            }
            else
            {
                user = SqlUser.getByCustomerId(comboBox2.Text[0].ToString());
                order = new Order(user.id!, comboBox5.Text[0].ToString(),
(DataModels.Type)Enum.Parse(typeof(DataModels.Type), comboBox3.Text),
Convert.ToDecimal(textBox3.Text), 0, Convert.ToDecimal(textBox3.Text));
                order = SqlOrder.add(order);
                payment = new Payment(user.id!, order.id!, comboBox4.Text[0].ToString(), Mode.Online,
Status.Finished, (DataModels.Type)Enum.Parse(typeof(DataModels.Type), comboBox3.Text));

            }
            payment = SqlPayment.add(payment);

            foreach (UserItem item in userItems)
            {
                Order_Item orderItem = new Order_Item(item.product_id, item.item_id, order.id!,
Convert.ToDecimal(item.price), Convert.ToInt64(item.quantity), Convert.ToDecimal(item.totalPrice));
                SqlOrder_Item.add(orderItem);
                Item inventoryQuantityUpdate = SqlItem.getById(orderItem.item_id);

                //if sold to customer then reduce quantity from inventory
                if (comboBox3.Text == "Out")
                {
                    inventoryQuantityUpdate.quantity -= orderItem.quantity;
                    SqlItem.update(inventoryQuantityUpdate);
                }
                //if bought from supplier then increase quantity in inventory
                else
                {
                    inventoryQuantityUpdate.quantity += orderItem.quantity;
                    SqlItem.update(inventoryQuantityUpdate);
                }
            }
            refreshOrderData();
        }
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }
}


//temporary class for showing items added by user in the list
public class UserItem {
    public string product_id;
    public string item_id;
    public string price;
    public string quantity;
```

```
        public string totalPrice;

        public UserItem(string product_id, string item_id, string price, string quantity, string totalPrice)
        {
            this.product_id = product_id;
            this.item_id = item_id;
            this.price = price;
            this.quantity = quantity;
            this.totalPrice = totalPrice;
        }

        override
        public string ToString()
        {
            Product product = SqlProduct.getById(product_id);
            return $"{item_id}) {product.title}: {totalPrice}";
        }
    }
}
```

CONTROL USERS

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using static System.Windows.Forms.VisualStyles.VisualStyleElement;

namespace IMS_Main
{
    public partial class ControlUsers : UserControl
    {
        List<Employee> employees;
        List<Supplier> suppliers;
        List<Customer> customers;
        string currentUserType = "";
        public ControlUsers()
        {
            InitializeComponent();
            employees = SqlEmployee.getAll();
            suppliers = SqlSupplier.getAll();
            customers = SqlCustomer.getAll();
        }

        private void clearFields()
        {
            textBox1.Clear();
            textBox2.Clear();
            textBox3.Clear();
            textBox4.Clear();
```

```
        textBox6.Clear();
        maskedTextBox1.Clear();
        textBox8.Clear();
        textBox9.Clear();
        textBox10.Clear();
    }

    private void refreshEmployeeData()
    {
        // Set up columns for selective properties if not already done
        dataGridView1.Columns.Clear(); // Clear existing columns if needed

        // Add columns for selective properties
        dataGridView1.Columns.Add("employee_id", "employee_id");
        dataGridView1.Columns.Add("firstName", "firstNameName");
        dataGridView1.Columns.Add("lastName", "lastName");
        dataGridView1.Columns.Add("username", "username");
        dataGridView1.Columns.Add("mobile", "mobile");
        dataGridView1.Columns.Add("email", "email");
        dataGridView1.Columns.Add("address", "address");
        dataGridView1.Columns.Add("registeredAt", "registeredAt");
        dataGridView1.Columns.Add("salary", "salary");
        dataGridView1.Columns.Add("role", "role");

        employees = SqlEmployee.getAll();
        foreach (Employee employee in employees)
        {
            User user = SqlUser.getByEmployeeId(employee.id!);
            dataGridView1.Rows.Add(employee.id, user.firstName, user.lastName, user.username, user.mobile,
user.email, user.address, user.registeredAt, employee.salary, employee.role.ToString());
        }
    }

    //Employee button
    private void button3_Click(object sender, EventArgs e)
    {
        try
        {
            if (LoginForm.loggedInAs != "admin")
            {
                throw new Exception("Only for Admin");
            }

            clearFields();
            //showing extra fields of employee
            label10.Visible = true;
            label12.Visible = true;
            textBox10.Visible = true;
            textBox4.Visible = true;
            button7.Visible = false; //shipping address for only customer

            //filling type combobox with Customer types
            comboBox3.DataSource = Enum.GetValues(typeof(Role));

            currentUserType = "employee";
            refreshEmployeeData();
        }
```

```
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }

    private void refreshSupplierData()
    {
        // Set up columns for selective properties if not already done
        dataGridView1.Columns.Clear(); // Clear existing columns if needed

        dataGridView1.Columns.Add("supplier_id", "supplier_id");
        dataGridView1.Columns.Add("firstName", "firstNameName");
        dataGridView1.Columns.Add("lastName", "lastName");
        dataGridView1.Columns.Add("username", "username");
        dataGridView1.Columns.Add("mobile", "mobile");
        dataGridView1.Columns.Add("email", "email");
        dataGridView1.Columns.Add("address", "address");
        dataGridView1.Columns.Add("registeredAt", "registeredAt");
        dataGridView1.Columns.Add("supplier_type", "supplier_type");

        suppliers = SqlSupplier.getAll();

        foreach (Supplier supplier in suppliers)
        {
            User user = SqlUser.getBySupplierId(supplier.id!);
            dataGridView1.Rows.Add(supplier.id, user.firstName, user.lastName, user.username, user.mobile,
user.email, user.address, user.registeredAt, supplier.supplier_type.ToString());
        }
    }

    //Supplier button
    private void button2_Click(object sender, EventArgs e)
    {
        clearFields();
        //hiding extra fields of employee
        label10.Visible = false;
        label12.Visible = false;
        textBox10.Visible = false;
        textBox4.Visible = false;
        button7.Visible = false; //shipping address for only customer

        //filling type combobox with Customer types
        comboBox3.DataSource = Enum.GetValues(typeof(Supplier_Type));

        currentUserType = "supplier";
        refreshSupplierData();
    }

    private void refreshCustomerData()
    {
        // Set up columns for selective properties if not already done
        dataGridView1.Columns.Clear(); // Clear existing columns if needed

        dataGridView1.Columns.Add("customer_id", "customer_id");
        dataGridView1.Columns.Add("firstName", "firstNameName");
        dataGridView1.Columns.Add("lastName", "lastName");
```

```
        dataGridView1.Columns.Add("username", "username");
        dataGridView1.Columns.Add("mobile", "mobile");
        dataGridView1.Columns.Add("email", "email");
        dataGridView1.Columns.Add("address", "address");
        dataGridView1.Columns.Add("registeredAt", "registeredAt");
        dataGridView1.Columns.Add("customer_type", "customer_type");


        customers = SqlCustomer.getAll();
        foreach (Customer customer in customers)
        {
            User user = SqlUser.getByCustomerId(customer.id!);
            dataGridView1.Rows.Add(customer.id, user.firstName, user.lastName, user.username, user.mobile,
user.email, user.address, user.registeredAt, customer.customer_type.ToString());
        }
    }

    //Customer button
    private void button1_Click(object sender, EventArgs e)
    {
        clearFields();
        //hiding extra fields of employee
        label10.Visible = false;
        label12.Visible = false;
        textBox10.Visible = false;
        textBox4.Visible = false;
        button7.Visible = true; //shipping address for only customer

        //filling type combobox with Customer types
        comboBox3.DataSource = Enum.GetValues(typeof(Customer_Type));


        currentUserType = "customer";
        refreshCustomerData();
    }

    //row is clicked
    private void dataGridView1_CellContentClick(object sender, DataGridViewCellEventArgs e)
    {
        try
        {
            //if user is customer
            if (currentUserType == "customer")
            {
                // Check if the row index is valid (e.g., avoid header row clicks)
                if (e.RowIndex >= 0)
                {
                    // Get the clicked row
                    DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

                    string id = selectedRow.Cells[0].Value.ToString()!; // Value of the first cell
                    Customer customer = SqlCustomer.getById(id);
                    User user = SqlUser.getByCustomerId(id);

                    textBox1.Text = customer.id;
                    textBox8.Text = user.firstName;
                    textBox2.Text = user.lastName;
```

```
            textBox3.Text = user.username;
            maskedTextBox1.Text = user.mobile;
            textBox6.Text = user.email;
            richTextBox1.Text = user.address;
            textBox9.Text = user.registeredAt;
            comboBox3.Text = customer.customer_type.ToString();
        }
    }

    //if user is supplier
    else if (currentUserType == "supplier")
    {
        // Check if the row index is valid (e.g., avoid header row clicks)
        if (e.RowIndex >= 0)
        {
            // Get the clicked row
            DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

            string id = selectedRow.Cells[0].Value.ToString()!; // Value of the first cell
            Supplier supplier = SqlSupplier.getById(id);
            User user = SqlUser.getBySupplierId(id);

            textBox1.Text = supplier.id;
            textBox8.Text = user.firstName;
            textBox2.Text = user.lastName;
            textBox3.Text = user.username;
            maskedTextBox1.Text = user.mobile;
            textBox6.Text = user.email;
            richTextBox1.Text = user.address;
            textBox9.Text = user.registeredAt;
            comboBox3.Text = supplier.supplier_type.ToString();
        }
    }

    //if user is employee
    else if (currentUserType == "employee")
    {
        // Check if the row index is valid (e.g., avoid header row clicks)
        if (e.RowIndex >= 0)
        {
            // Get the clicked row
            DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

            string id = selectedRow.Cells[0].Value.ToString()!; // Value of the first cell
            Employee employee = SqlEmployee.getById(id);
            User user = SqlUser.getByEmployeeId(id);

            textBox1.Text = employee.id;
            textBox8.Text = user.firstName;
            textBox2.Text = user.lastName;
            textBox3.Text = user.username;
            maskedTextBox1.Text = user.mobile;
            textBox6.Text = user.email;
            richTextBox1.Text = user.address;
            textBox9.Text = user.registeredAt;
            comboBox3.Text = employee.role.ToString();
            textBox10.Text = employee.salary.ToString();
```

```
                textBox4.Text = employee.passwordHash.ToString();
            }
        }
    }
    catch (Exception ex)
    {
        label11.Text = ex.Message;
    }
}

//Add button is clicked
private void button4_Click(object sender, EventArgs e)
{
    try
    {
        if (currentUserType == "customer")
        {
            if (textBox3.Text == "" || textBox6.Text == "" || maskedTextBox1.Text == "" || textBox8.Text == ""
|| richTextBox1.Text == "" || comboBox3.Text == "") throw new Exception("Fill all details");
            Customer customer = new Customer(textBox6.Text,
(Customer_Type)Enum.Parse(typeof(Customer_Type), comboBox3.Text));
            customer = SqlCustomer.add(customer);

            User user = new User(User_Type.Customer, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, customer_id: customer.id, lastName: textBox2.Text);
            user = SqlUser.add(user);
            MessageBox.Show($"Customer Added with ID: {customer.id}");
            refreshCustomerData();
        }

        else if (currentUserType == "supplier")
        {
            if (textBox3.Text == "" || textBox6.Text == "" || maskedTextBox1.Text == "" || textBox8.Text == ""
|| richTextBox1.Text == "" || comboBox3.Text == "") throw new Exception("Fill all details");
            Supplier supplier = new Supplier(textBox6.Text, (Supplier_Type)Enum.Parse(typeof(Supplier_Type),
comboBox3.Text));
            supplier = SqlSupplier.add(supplier);

            User user = new User(User_Type.Supplier, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, supplier_id: supplier.id, lastName: textBox2.Text);
            user = SqlUser.add(user);
            MessageBox.Show($"Supplier Added with ID: {supplier.id}");
            refreshSupplierData();
        }

        else if (currentUserType == "employee")
        {
            if (textBox3.Text == "" || textBox6.Text == "" || maskedTextBox1.Text == "" || textBox8.Text == ""
|| richTextBox1.Text == "" || comboBox3.Text == "" || textBox4.Text == "" || textBox10.Text == "") throw new
Exception("Fill all details");
            Employee employee = new Employee(Convert.ToDecimal(textBox10.Text),
(Role)Enum.Parse(typeof(Role), comboBox3.Text), textBox4.Text);
            employee = SqlEmployee.add(employee);

            User user = new User(User_Type.Supplier, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, employee_id: employee.id, lastName: textBox2.Text);
            user = SqlUser.add(user);
```

```
            MessageBox.Show($"Employee Added with ID: {employee.id}");
            refreshEmployeeData();
          }
        }
        catch (Exception ex)
        {
          label11.Text = ex.Message;
        }
      }

      //delete button is clicked
      private void button5_Click(object sender, EventArgs e)
      {
        try
        {
          if (currentUserType == "customer")
          {
            if (textBox1.Text == "") return;
            SqlCustomer.delete(textBox1.Text);
            refreshCustomerData();
          }

          else if (currentUserType == "supplier")
          {
            if (textBox1.Text == "") return;
            SqlSupplier.delete(textBox1.Text);
            refreshSupplierData();
          }

          else if (currentUserType == "employee")
          {
            if (textBox1.Text == "" || textBox4.Text == "" || textBox10.Text == "") throw new Exception("Fill all
details");
            SqlEmployee.delete(textBox1.Text);
            refreshEmployeeData();
          }
        }
        catch (Exception ex)
        {
          label11.Text = ex.Message;
        }
      }

      //update button is clicked
      private void button6_Click(object sender, EventArgs e)
      {
        try
        {
          if (currentUserType == "customer")
          {
            if (textBox1.Text == "") return;
            Customer customer = new Customer(textBox6.Text,
(Customer_Type)Enum.Parse(typeof(Customer_Type), comboBox3.Text));
            customer.id = textBox1.Text;
            SqlCustomer.update(customer);
```

```
                User user = new User(User_Type.Customer, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, customer_id: textBox1.Text, lastName: textBox2.Text);
                SqlUser.updateByCustomerId(user);

                MessageBox.Show("Customer Updated");
                refreshCustomerData();
            }

            else if (currentUserType == "supplier")
            {
                if (textBox1.Text == "") return;
                Supplier Supplier = new Supplier(textBox6.Text, (Supplier_Type)Enum.Parse(typeof(Supplier_Type),
comboBox3.Text));
                Supplier.id = textBox1.Text;
                SqlSupplier.update(Supplier);

                User user = new User(User_Type.Supplier, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, supplier_id: textBox1.Text, lastName: textBox2.Text);
                SqlUser.updateBySupplierId(user);

                MessageBox.Show("Supplier Updated");
                refreshSupplierData();
            }

            else if (currentUserType == "employee")
            {
                Employee Employee = new Employee(Convert.ToDecimal(textBox10.Text),
(Role)Enum.Parse(typeof(Role), comboBox3.Text), textBox4.Text);
                Employee.id = textBox1.Text;
                SqlEmployee.update(Employee);

                User user = new User(User_Type.Employee, textBox8.Text, textBox3.Text, maskedTextBox1.Text,
textBox6.Text, richTextBox1.Text, employee_id: textBox1.Text, lastName: textBox2.Text);
                SqlUser.updateByEmployeeId(user);

                MessageBox.Show("Employee Updated");
                refreshEmployeeData();
            }
        }
        catch (Exception ex)
        {
            label11.Text = ex.Message;
        }
    }

    private void button7_Click(object sender, EventArgs e)
    {
        if (textBox1.Text == "") return;
        ShippingAddressesForm shippingAddressesForm = new ShippingAddressesForm(textBox1.Text);
        shippingAddressesForm.ShowDialog();
    }
  }
}
```

LOADING FORM

```
using DataAccessLayer;
using DataModels;
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using static System.Windows.Forms.VisualStyles.VisualStyleElement;

namespace IMS_Main
{
   public partial class ShippingAddressesForm : Form
   {
      string customer_id;
      public ShippingAddressesForm(string customer_id)
      {
         InitializeComponent();
         this.customer_id = customer_id;
      }

      private void ShippingAddressesForm_Load(object sender, EventArgs e)
      {
         dataGridView1.DataSource = SqlShippingAddress.getMany(customer_id);
         User user = SqlUser.getByCustomerId(customer_id);
         label6.Text = $"{user.firstName} {user.lastName}";
      }

      //Row is clicked
      private void dataGridView1_CellContentClick(object sender, DataGridViewCellEventArgs e)
      {
         try
         {
            // Check if the row index is valid (e.g., avoid header row clicks)
            if (e.RowIndex >= 0)
            {
               // Get the clicked row
               DataGridViewRow selectedRow = dataGridView1.Rows[e.RowIndex];

               textBox4.Text = selectedRow.Cells[0].Value.ToString()!; //id
               textBox5.Text = selectedRow.Cells[1].Value.ToString()!; //customer_id
               textBox1.Text = selectedRow.Cells[2].Value.ToString()!; //city
               textBox2.Text = selectedRow.Cells[3].Value.ToString()!; //state
               textBox3.Text = selectedRow.Cells[4].Value.ToString()!; //country
               richTextBox1.Text = selectedRow.Cells[5].Value.ToString()!; //more
            }
         }
         catch (Exception ex)
         {
            label11.Text = ex.Message;
         }
      }
```

```
    //Add button is clicked
    private void button4_Click(object sender, EventArgs e)
    {
      try
      {
        if (textBox1.Text == "" || textBox2.Text == "" || textBox3.Text == "") return;
        ShippingAddress shippingAddress = new ShippingAddress(customer_id, textBox1.Text, textBox2.Text,
textBox3.Text, more: richTextBox1.Text);

        //add and refresh UI
        SqlShippingAddress.add(shippingAddress);
        dataGridView1.DataSource = SqlShippingAddress.getMany(customer_id);
        MessageBox.Show("Address Added Successfully");
      }
      catch (Exception ex)
      {
        label11.Text = ex.Message;
      }
    }

    //delete button is clicked
    private void button5_Click(object sender, EventArgs e)
    {
      try
      {
        if (textBox4.Text == "") return;

        //add and refresh UI
        SqlShippingAddress.delete(textBox4.Text);
        dataGridView1.DataSource = SqlShippingAddress.getMany(customer_id);
        MessageBox.Show("Address Deleted Successfully");
      }
      catch (Exception ex)
      {
        label11.Text = ex.Message;
      }
    }

    //update button is clicked
    private void button6_Click(object sender, EventArgs e)
    {
      try
      {
        if (textBox1.Text == "" || textBox2.Text == "" || textBox3.Text == "" || textBox4.Text == "" ||
textBox5.Text == "") return;
        ShippingAddress shippingAddress = new ShippingAddress(textBox5.Text, textBox1.Text,
textBox2.Text, textBox3.Text, more: richTextBox1.Text);
        shippingAddress.id = textBox4.Text;

        //update and refresh UI
        SqlShippingAddress.update(shippingAddress);
        dataGridView1.DataSource = SqlShippingAddress.getMany(customer_id);
        MessageBox.Show("Address Updated Successfully");
      }
      catch (Exception ex)
      {
```

```
            label11.Text = ex.Message;
          }
      }

      private void label9_Click(object sender, EventArgs e)
      {
         this.Close();
      }
   }
}
```

SQL QUERIES

```
create database Inventory_Management_System;
use Inventory_Management_System;

create table captcha (
            id int primary key identity(1, 1),
            text nvarchar(10),
            path nvarchar(100)
);

insert into captcha(text, path)
values
('TXGAP', 'images\image1.png'),
('MLPSY', 'images\image2.png'),
('NQCLA', 'images\image3.png')

CREATE TABLE "item"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "product_id" BIGINT NOT NULL,
   "brand_id" BIGINT NOT NULL,
   "supplier_id" BIGINT NULL,
   "price" BIGINT NOT NULL,
   "discount" INT NOT NULL,
   "quantity" BIGINT NOT NULL,
   "stockValue" BIGINT NOT NULL,
   "alarm_quantity" BIGINT NOT NULL
);
ALTER TABLE
   "item" ADD CONSTRAINT "item_id_primary" PRIMARY KEY("id");
CREATE TABLE "payment"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "user_id" BIGINT NULL,
   "order_id" BIGINT NOT NULL,
   "shippintAddress_id" BIGINT NULL,
   "mode" NVARCHAR(255) CHECK
      ("mode" IN(N'Online', N'Cod')) NOT NULL,
      "status" NVARCHAR(255)
   CHECK
      (
         "status" IN(N'Pending', N'Finished', N'Failed')
      ) NOT NULL,
      "createdAt" DATETIME NOT NULL DEFAULT GETDATE(),
      "type" NVARCHAR(255)
   CHECK
      ("type" IN(N'In', N'Out')) NOT NULL
```

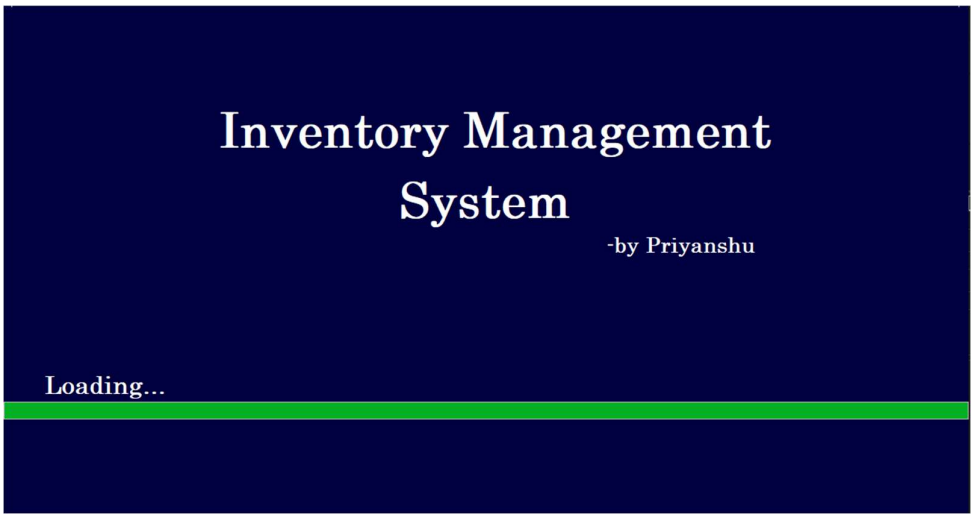
```
);
ALTER TABLE
   "payment" ADD CONSTRAINT "payment_id_primary" PRIMARY KEY("id");
CREATE TABLE "order"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "user_id" BIGINT NULL,
   "employee_id" BIGINT NULL,
   "type" NVARCHAR(255) CHECK
      ("type" IN(N'In', N'Out')) NOT NULL,
      "subTotal" BIGINT NOT NULL,
      "tax" BIGINT NOT NULL,
      "total" BIGINT NOT NULL
);
ALTER TABLE
   "order" ADD CONSTRAINT "order_id_primary" PRIMARY KEY("id");
CREATE TABLE "shippingAddress"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "customer_id" BIGINT NOT NULL,
   "city" NVARCHAR(255) NOT NULL,
   "state" NVARCHAR(255) NOT NULL,
   "country" NVARCHAR(255) NOT NULL,
   "more" NVARCHAR(255) NULL
);
ALTER TABLE
   "shippingAddress" ADD CONSTRAINT "shippingaddress_id_primary" PRIMARY KEY("id");
CREATE TABLE "product"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "title" NVARCHAR(255) NOT NULL,
   "description" NVARCHAR(255) NULL,
   "createdAt" DATETIME NOT NULL DEFAULT GETDATE()
);
ALTER TABLE
   "product" ADD CONSTRAINT "product_id_primary" PRIMARY KEY("id");
CREATE TABLE "customer"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "email" NVARCHAR(255) NOT NULL,
   "customer_type" NVARCHAR(255) CHECK
      (
         "customer_type" IN(N'Rich', N'Poor', N'Medium')
      ) NOT NULL
);
ALTER TABLE
   "customer" ADD CONSTRAINT "customer_id_primary" PRIMARY KEY("id");
CREATE UNIQUE INDEX "customer_email_unique" ON
   "customer"("email");
CREATE TABLE "brand"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "title" NVARCHAR(255) NOT NULL,
   "summary" NVARCHAR(255) NULL,
   "popularity" NVARCHAR(255) CHECK
      (
         "popularity" IN(N'Low', N'Medium', N'High')
      ) NOT NULL
);
insert into brand values('Samsung', 'Korean company', 'High');

ALTER TABLE
```

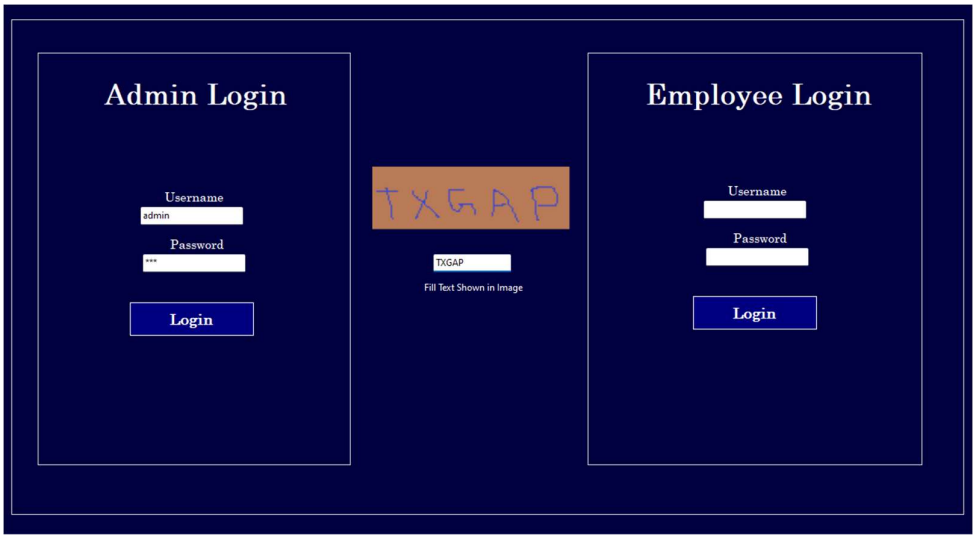
```
   "brand" ADD CONSTRAINT "brand_id_primary" PRIMARY KEY("id");
CREATE TABLE "employee"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "salary" BIGINT NOT NULL,
   "role" NVARCHAR(255) CHECK
      ("role" IN(N'Manager', N'Sales')) NOT NULL,
      "passwordHash" NVARCHAR(255) NOT NULL
);
ALTER TABLE
   "employee" ADD CONSTRAINT "employee_id_primary" PRIMARY KEY("id");
CREATE TABLE "order_item"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "product_id" BIGINT NULL,
   "item_id" BIGINT NULL,
   "order_id" BIGINT NOT NULL,
   "price" BIGINT NOT NULL,
   "quantitiy" BIGINT NOT NULL,
   "total_price" BIGINT NOT NULL
);
ALTER TABLE
   "order_item" ADD CONSTRAINT "order_item_id_primary" PRIMARY KEY("id");
CREATE TABLE "product_category"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "category_id" BIGINT NOT NULL,
   "product_id" BIGINT NOT NULL
);
ALTER TABLE
   "product_category" ADD CONSTRAINT "product_category_id_primary" PRIMARY KEY("id");
CREATE TABLE "supplier"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "email" NVARCHAR(255) NOT NULL,
   "supplier_type" NVARCHAR(255) CHECK
      (
         "supplier_type" IN(N'Trusted', N'New')
      ) NOT NULL
);
ALTER TABLE
   "supplier" ADD CONSTRAINT "supplier_id_primary" PRIMARY KEY("id");
CREATE UNIQUE INDEX "supplier_email_unique" ON
   "supplier"("email");
CREATE TABLE "category"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "title" NVARCHAR(255) NOT NULL,
   "description" NVARCHAR(255) NULL
);
ALTER TABLE
   "category" ADD CONSTRAINT "category_id_primary" PRIMARY KEY("id");
CREATE TABLE "loginSession"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "employee_id" BIGINT NOT NULL,
   "loggedInAt" DATETIME NOT NULL DEFAULT GETDATE()
);
ALTER TABLE
   "loginSession" ADD CONSTRAINT "loginsession_id_primary" PRIMARY KEY("id");
CREATE TABLE "user"(
   "id" BIGINT NOT NULL IDENTITY(1, 1),
   "supplier_id" BIGINT NULL,
```

```
    "customer_id" BIGINT NULL,
    "employee_id" BIGINT NULL,
    "user_type" NVARCHAR(255) CHECK
        (
            "user_type" IN(
                N'Customer',
                N'Supplier',
                N'Employee'
            )
        ) NOT NULL,
        "firstName" NVARCHAR(255) NOT NULL,
        "lastName" NVARCHAR(255) NULL,
        "username" NVARCHAR(255) NOT NULL,
        "mobile" BIGINT NOT NULL,
        "email" NVARCHAR(255) NOT NULL,
        "address" NVARCHAR(255) NOT NULL,
        "registeredAt" DATETIME NOT NULL DEFAULT GETDATE()
);
ALTER TABLE
    "user" ADD CONSTRAINT "user_id_primary" PRIMARY KEY("id");
CREATE UNIQUE INDEX "user_username_unique" ON
    "user"("username");
CREATE UNIQUE INDEX "user_mobile_unique" ON
    "user"("mobile");
CREATE UNIQUE INDEX "user_email_unique" ON
    "user"("email");
ALTER TABLE
    "order_item" ADD CONSTRAINT "order_item_product_id_foreign" FOREIGN KEY("product_id") REFERENCES
"product"("id") ON DELETE NO ACTION;
ALTER TABLE
    "item" ADD CONSTRAINT "item_product_id_foreign" FOREIGN KEY("product_id") REFERENCES
"product"("id") ON DELETE CASCADE;
ALTER TABLE
    "user" ADD CONSTRAINT "user_supplier_id_foreign" FOREIGN KEY("supplier_id") REFERENCES
"supplier"("id") ON DELETE CASCADE;
ALTER TABLE
    "item" ADD CONSTRAINT "item_supplier_id_foreign" FOREIGN KEY("supplier_id") REFERENCES
"supplier"("id") ON DELETE SET NULL;
ALTER TABLE
    "payment" ADD CONSTRAINT "payment_user_id_foreign" FOREIGN KEY("user_id") REFERENCES "user"("id")
ON DELETE SET NULL;
ALTER TABLE
    "product_category" ADD CONSTRAINT "product_category_product_id_foreign" FOREIGN KEY("product_id")
REFERENCES "product"("id") ON DELETE CASCADE;
ALTER TABLE
    "payment" ADD CONSTRAINT "payment_order_id_foreign" FOREIGN KEY("order_id") REFERENCES
"order"("id");
ALTER TABLE
    "item" ADD CONSTRAINT "item_brand_id_foreign" FOREIGN KEY("brand_id") REFERENCES "brand"("id");
ALTER TABLE
    "payment" ADD CONSTRAINT "payment_shippintaddress_id_foreign" FOREIGN KEY("shippintAddress_id")
REFERENCES "shippingAddress"("id") ON DELETE SET NULL;
ALTER TABLE
    "order_item" ADD CONSTRAINT "order_item_item_id_foreign" FOREIGN KEY("item_id") REFERENCES
"item"("id") ON DELETE SET NULL;
ALTER TABLE
```

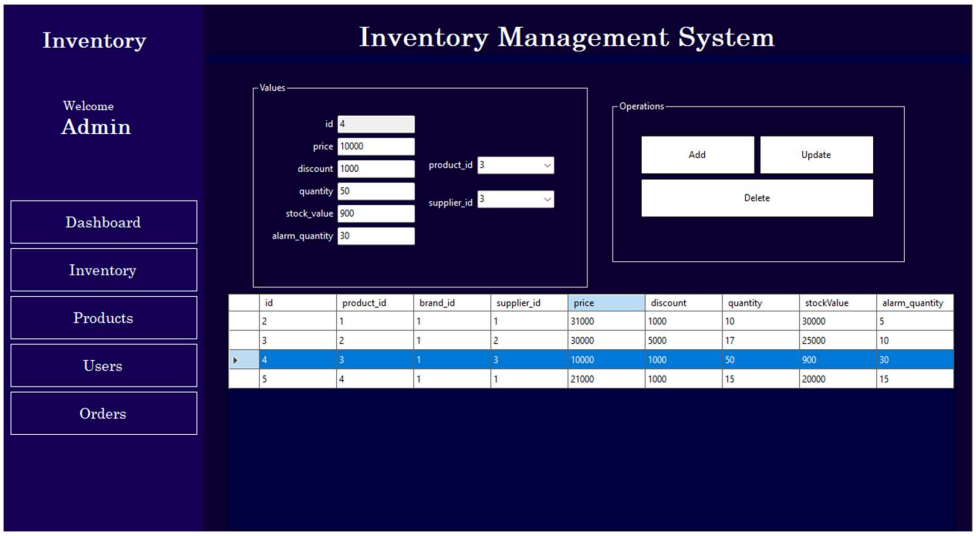
```
   "product_category" ADD CONSTRAINT "product_category_category_id_foreign" FOREIGN
KEY("category_id") REFERENCES "category"("id");
ALTER TABLE
   "order_item" ADD CONSTRAINT "order_item_order_id_foreign" FOREIGN KEY("order_id") REFERENCES
"order"("id");
ALTER TABLE
   "order" ADD CONSTRAINT "order_employee_id_foreign" FOREIGN KEY("employee_id") REFERENCES
"employee"("id") ON DELETE SET NULL;
ALTER TABLE
   "loginSession" ADD CONSTRAINT "loginsession_employee_id_foreign" FOREIGN KEY("employee_id")
REFERENCES "employee"("id") ON DELETE CASCADE;
ALTER TABLE
   "user" ADD CONSTRAINT "user_employee_id_foreign" FOREIGN KEY("employee_id") REFERENCES
"employee"("id") ON DELETE CASCADE;
ALTER TABLE
   "order" ADD CONSTRAINT "order_user_id_foreign" FOREIGN KEY("user_id") REFERENCES "user"("id") ON
DELETE NO ACTION;
ALTER TABLE
   "user" ADD CONSTRAINT "user_customer_id_foreign" FOREIGN KEY("customer_id") REFERENCES
"customer"("id") ON DELETE CASCADE;
ALTER TABLE
   "shippingAddress" ADD CONSTRAINT "shippingaddress_customer_id_foreign" FOREIGN KEY("customer_id")
REFERENCES "customer"("id") ON DELETE NO ACTION;
```

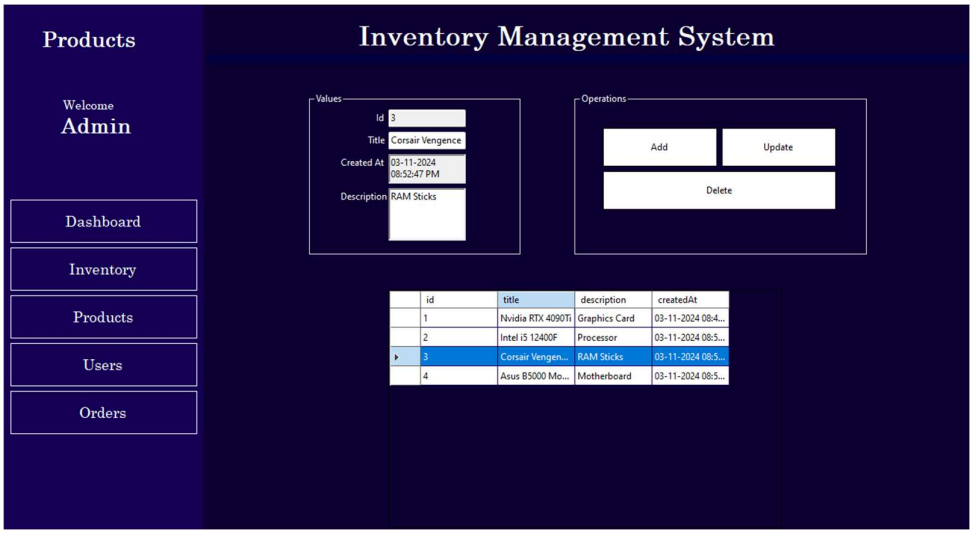
SCREENSHOTS:

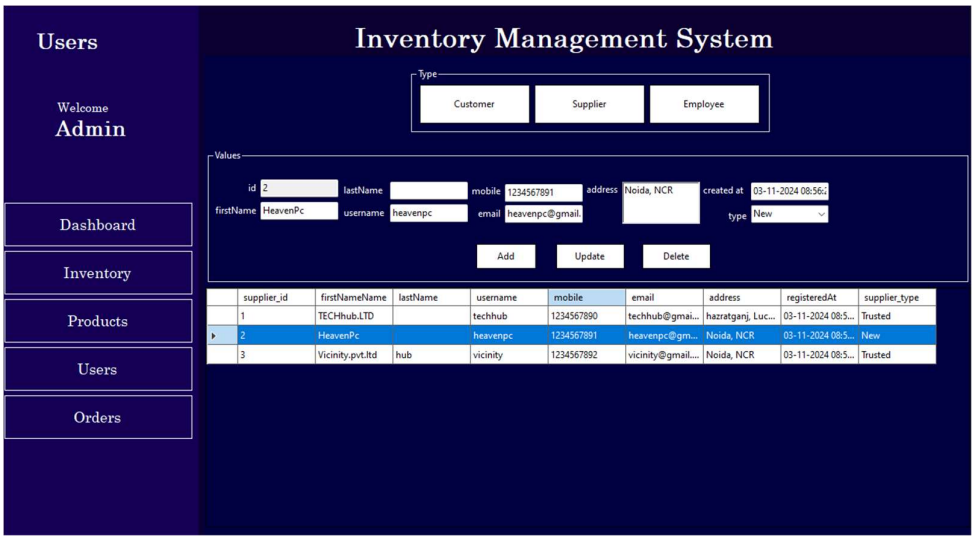


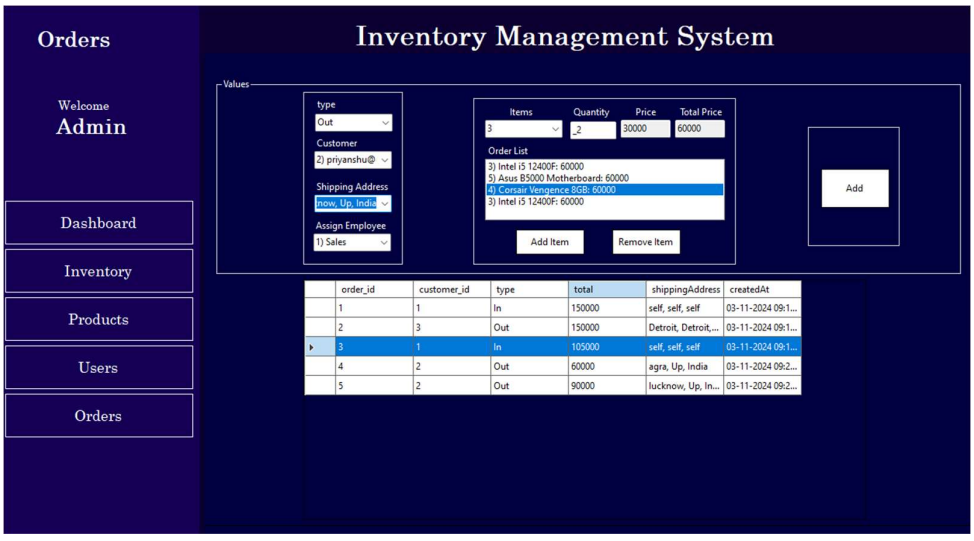

Admin Login
Username
admin
Password
***
Login
TXGAP
TXGAP
Fill Text Shown in Image
Employee Login
Username
Password
Login


Dashboard
Welcome
Admin
Dashboard
Inventory
Products
Users
Orders
Inventory Management System
Profit
Rs 300000
Best Customer
Markus Fields
Date
19-11-2024
Inventory On Alarm Quantity
id
product_id
brand_id
supplier_i
price
5
4
1
1
21000
User Count
Customers
Suppliers
Employees
3
3
2
Biggest Order Value
Rs 150000


Inventory
Welcome
Admin
Dashboard
Inventory
Products
Users
Orders
Inventory Management System
Values
id 4
price 10000
discount 1000
quantity 50
stock_value 900
alarm_quantity 30
product_id 3
supplier_id 3
Operations
Add
Update
Delete
id
product_id
brand_id
supplier_id
price
discount
quantity
stockValue
alarm_quantity
2 1 1 1 31000 1000 10 30000 5
3 2 1 2 30000 5000 17 25000 10
4 3 1 3 10000 1000 50 900 30
5 4 1 1 21000 1000 15 20000 15


Products
Welcome
Admin
Dashboard
Inventory
Products
Users
Orders
Inventory Management System
Values
Id 3
Title Corsair Vengence
Created At 03-11-2024 08:52:47 PM
Description RAM Sticks
Operations
Add
Update
Delete
id title description createdAt
1 Nvidia RTX 4090Ti Graphics Card 03-11-2024 08:4...
2 Intel i5 12400F Processor 03-11-2024 08:5...
3 Corsair Vengen... RAM Sticks 03-11-2024 08:5...
4 Asus B5000 Mo... Motherboard 03-11-2024 08:5...


Users
Welcome
Admin
Dashboard
Inventory
Products
Users
Orders
Inventory Management System
Type
Customer
Supplier
Employee
Values
id 2
lastName
mobile 1234567891
address Noida, NCR
created at 03-11-2024 08:56:2
firstName HeavenPc
username heavenpc
email heavenpc@gmail.
type New
Add
Update
Delete
supplier_id firstNameName lastName username mobile email address registeredAt supplier_type
1 TECHhub.LTD techhub 1234567890 techhub@gmai... hazratganj, Luc... 03-11-2024 08:5... Trusted
2 HeavenPc heavenpc 1234567891 heavenpc@gm... Noida, NCR 03-11-2024 08:5... New
3 Vicinity.pvt.ltd hub vicinity 1234567892 vicinity@gmail.... Noida, NCR 03-11-2024 08:5... Trusted


Orders
Welcome
Admin
Dashboard
Inventory
Products
Users
Orders
Inventory Management System
Values
type
Out
Customer
2) priyanshu@
Shipping Address
now, Up, India
Assign Employee
1) Sales
Items Quantity Price Total Price
3 2 30000 60000
Order List
3) Intel i5 12400F: 60000
5) Asus B5000 Motherboard: 60000
4) Corsair Vengence 8GB: 60000
3) Intel i5 12400F: 60000
Add Item
Remove Item
Add
order_id customer_id type total shippingAddress createdAt
1 1 In 150000 self, self, self 03-11-2024 09:1...
2 3 Out 150000 Detroit, Detroit,... 03-11-2024 09:1...
3 1 In 105000 self, self, self 03-11-2024 09:1...
4 2 Out 60000 agra, Up, India 03-11-2024 09:2...
5 2 Out 90000 lucknow, Up, In... 03-11-2024 09:2...