## Logos - London Metropolitan UniversityCourse Submission Cover Sheet

Module: CS6004ES Application Development

Assignment no: 001

Weighting: 30%

Deadline: TBC

**Module Leader: Mr.** **Rattapol Kasemrat** **Student ID: 681347308200002**

Please note that there are specific regulations concerning **the use of AI and Academic Misconduct**. Below are extracts from these regulations. By signing, you acknowledge that you have read and understood these extracts.

(signature:) Date: 19/7/2025

This header sheet should be attached to the work you submit.

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# Software Development Task

You are employed as an Application Developer for a large IT development company. The company has been approached by a Household goods shifting company called e-Shift has grown to a level where they need to have an automated system to handle day today operational activities to meet customer demands. You are given the job to design and developing a Software solution for e-Shift to meet their business requirements.

The company transports Household Goods from one location to another on behalf of registered customers. Each customer is given a unique customer number and his or her details must be recorded in the system. Each transport operation is called a job, which involves picking up one or more loads of the products from a customer requested start location and delivering it to a customer requested destination. A unique number is given for each job and for each load when they are created. A Load is transported using a particular transport unit, which consists of a lorry, a driver, assistant, and a container (for carrying the product).

The final system should be able to provide the required information for management decision making and to handle daily operations efficiently and effectively

***Note****: You may add extra features - both data and functionality to the application, if you wish.*

***Your software implementation should demonstrate/provide the following features***

1. Use of appropriate data types (built-in and programmer-defined) to handle the application data
2. Define and use your own class or classes
3. Provide window-based user interface for your application
4. Store the data related to the application

**Deliverables**

Your submission should include the software project and a reflective essay as described below.

1. Your software artefact in the form of a Visual Studio 2015 project, which should include the program’s source code, compiled classes, the executable file and data file (if any).
2. A reflective essay (1000 or more words), which concisely documents:
   1. Detailed instructions to run the program
   2. The architecture of your software in terms of software classes, clearly indicating which classes to be of your own work and which classes from other sources (e.g., From textbooks, online sources such as MSDN etc.).
   3. Detailed description of the classes’ properties and methods
   4. Your reflection of own experience of using c# and visual studio for the development task, which feature you like and why, what issues you experienced and your solution to overcome it.

**Marking Scheme for the CS6004ESIndividual Coursework**

This individual coursework counts for 30% of the module mark. The following are guidelines for marking. Mark each item listed below on a scale 0 to 5 where the marks correspond. Then multiply the mark by the weighting indicated, total and divide by 2 to get the total mark.

|  |  |
| --- | --- |
| Mark | Characterised by |
| 0 | No work or work totally irrelevant |
| 1 | Work started on right lines but no result |
| 2 | Some result, with major lack and/or errors |
| 3 | Acceptable result but incomplete, or some good result with minor errors |
| 4 | Good result but can be further polished |
| 5 | Excellent result |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Item** | **Weight** | **Marks** | **Weight X Marks** |
|  | **IMPLEMENTATION** |  |  |  |
| 1 | The application user interface | 2 | 5 | 10 |
| 2 | Task1: Customer details and Management | 2 | 5 | 10 |
| 3 | Task2: Only Admin Can Manage Admin Details. | 2 | 5 | 10 |
| 4 | Task3: Admin Login and Customer Login. | 3 | 5 | 15 |
| 5 | Task4: Customer Transport operation detail Management. | 2 | 5 | 10 |
| 6 | Task5: Only Admin can Accept/Decline and update Customer Transport operation. | 3 | 5 | 15 |
| 7 | Task6: Customer Dashboard. | 3 | 5 | 15 |
| 8 | Task7: Admin Dashboard. | 2 | 5 | 10 |
| 9 | Task8: Only Admin can manage Product details. | 2 | 5 | 10 |
| 10 | Task9: Only Admin can generate various reports | 2 | 5 | 10 |
| 11 | Task10: Admin Dashboard | 2 | 5 | 10 |
|  | **DOCUMENTATION** |  |  |  |
| 1 | Detailed instructions to run the program | 1 | 10 | 10 |
| 2 | The software architecture | 3 | 5 | 15 |
| 3 | Detailed description of the classes’ properties and methods | 2 | 5 | 10 |
| 4 | Explanation about search algorithms used in the project | 2 | 5 | 10 |
| 5 | Reflection of own experience | 1 | 5 | 5 |
|  | PROGRAMMING STYLE |  |  |  |
| 1 | Clarity of code which shows the underlying algorithm | 1 | 5 | 5 |
| 2 | Sensible naming of programmer-defined variables, classes, properties and methods | 1 | 5 | 5 |
| 3 | Useful comments in code | 1 | 5 | 5 |
| 4 | Data validation and exception handling | 1 | 5 | 5 |
| 5 | Interface design and usability of the system | 1 | 5 | 5 |

# Introduction

This paper describes a new software system for e-Shift, a company that moves household goods. Right now, e-Shift handles everything by hand, which is becoming too difficult as they grow and have more customers. This new system will automate their daily tasks, making things smoother and faster. It will help them manage **customer details**, keep track of every **moving job**, and carefully follow each **load of goods**. The system will also help them know where their **lorries, drivers, and containers** are. Our goal is to build a system that helps e-Shift work better and make smart decisions, so they can keep their customers happy and grow their business.

**Database Design**

The following is database table diagram. I used SQL Server Management Studio for database management. The AspNetRoles,AspNetUserRoles and AspNetUsers tables are built-in tables which are provided by ASP.NET Core Identity to assign roles for users. The other tables are as below:

* Orderline: Represents individual shipment orders, linking to a customer and containing details like addresses, date, weight, and status.
* Lorries: Contains details about the transport vehicles.
* Driver: Stores information about the drivers.
* Assistant: Stores information about the driver assistants.
* TransportUnit: Combines a Lorry, Driver, and Assistant to form a complete transport team for a job.
* Invoice: Records billing details, linked to Orderline and TransportUnit, including total amount and payment status.
* FeedBack: Stores customer feedback, linked to an Invoice.

**\** **A computer screen shot of a computer

AI-generated content may be incorrect.**

# Detailed Instructions to Run the Program

To ensure the e-Shift application functions correctly, Visual Studio 2022 and .NET Framework 9.0 are required to be installed on the system. Installation of these prerequisites should be completed first.

Following the setup, these steps outline the process for running the application:

Step 1 - Open the Project:

The project files are located in a specific directory. Within this directory, locate the Visual Studio Solution file which is LogisticsWebApp.sln. Double-clicking this file will open the project within Visual Studio 2022.

Step 2 - Build the Project:

Once the project is loaded in Visual Studio, navigate to the "Build" menu.Select "Build Solution." This action compiles the source code and prepares the necessary executable files for execution.

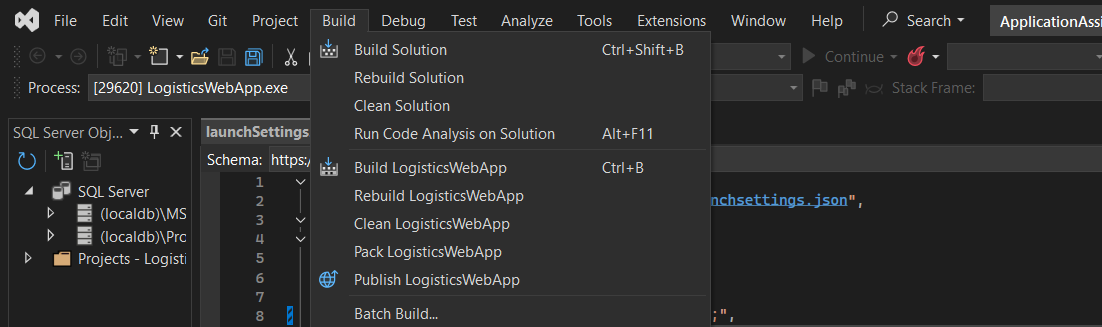


Figure: Build Solution

Step 3 - Run the Program:

After a successful build, the application can be launched directly from Visual Studio. Click the green "Start" button on the Visual Studio toolbar, or press F5 on the keyboard.

The application's main window will then be displayed.

A screenshot of a computer

AI-generated content may be incorrect.

Figure: Run Application

Step 4 - Application Access:

No manual database setup is required, as the application manages its data persistence internally. For administrative functionalities and testing, the default administrator credentials are provided:

Admin Email: moses@gmail.com

Admin Password: Moses123!

New customer accounts necessitate registration through the application's provided interface.

A screenshot of a login form

AI-generated content may be incorrect.

# Figure: New Customer Register

# Custom-Developed Classes

## **Model Classes**

### **Assistant Model Class**

The Assistantt Model class has properties for AssistantID, Name, Phone, and Age.

* AssistantID is a unique identifier.
* Name is required and can be up to 100 characters long.
* Phone is required, can be up to 20 characters long, and must be a valid phone number format.
* Age must be between 18 and 99.

A screen shot of a computer program

AI-generated content may be incorrect.

Figure: Assistant.cs

A screenshot of a computer

AI-generated content may be incorrect.

Figure: Creating New Assistant

A user with manager role and edit, delete and see details about assistant.

A screenshot of a computer

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Figure : Manage Assistants Dashboard

### **Driver Model Class**

The following are properties for Driver Model Class.

* DriverID is a unique identifier.
* Name is required and can be up to 100 characters long.
* Phone is required, can be up to 20 characters long, and must be a valid phone number format.
* Age must be between 18 and 99.

A computer screen shot of a program

AI-generated content may be incorrect.

Figure: Driver Model Class

A screenshot of a computer

AI-generated content may be incorrect.

Figure: Creating New Driver

In manage driver dashboard the manager can not only delete, edit but also find the driver by name or phone number.

A screenshot of a computer

AI-generated content may be incorrect.

Figure: Driver Management Dashboard

### **EditUserRoleView Model Class**

The EditUserRolesViewModel class is used to edit user roles. It has these properties:

* UserId: to identify the user.
* UserName: displayed as "Username".
* Email: must be a valid email address and will be displayed as "Email".
* PhoneNumber: must be a valid phone number format and will be displayed as "Phone Number".
* AllRoles: A list of RoleSelection objects, used to show and select roles.

The RoleSelection class is used within EditUserRolesViewModel to represent a single role option. It has these properties:

* RoleName: The name of the role.
* IsSelected: A boolean indicating if this role is currently selected.

A screen shot of a computer program

AI-generated content may be incorrect.

Figure: **EditUserRoleViewModel.cs**

Only manager role can create new user and assign role.

A screenshot of a computer

AI-generated content may be incorrect.

Figure: Register New User Dashboard

A screenshot of a computer screen

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Figure: Edit User Dashboard

### **Feedback Model Class**

This model class represents feedback information and includes these properties:

* FeedBackID: A unique identifier for the feedback, acting as its primary key.
* InvoiceID: A required identifier that links this feedback to an Invoice. It's a "foreign key."
* Invoice: This is a "navigation property" that allows direct access to the related Invoice object. It can be null.
* Rating: A required integer that must be between 1 and 5, representing a star rating.
* Message: An optional string for the feedback message, with a maximum length of 500 characters. The DataType.MultilineText suggests it should be displayed as a multi-line text area in a user interface.

A computer screen shot of a program

AI-generated content may be incorrect.

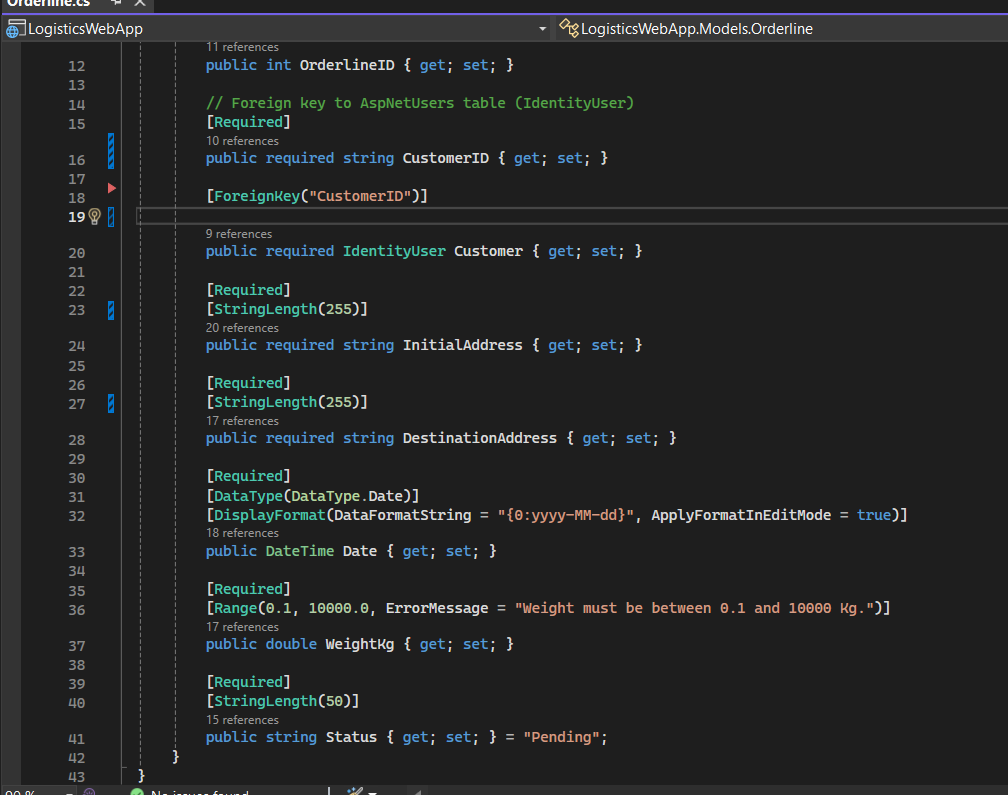
Figure: Feedback Model Class

**Orderline Model Class**

The following is Orderline Model class. The class includes

* **OrderLineID**: A unique identifier for each order line.
* **CustomerID**: A foreign key linking this order line to a specific AspNetUser (likely a user registered in the system using ASP.NET Core Identity).
* **Customer**: A navigation property (of type IdentityUser) that allows the application to access details of the associated customer directly.
* **InitialAddress**: The starting location for the shipment.
* **DestinationAddress**: The delivery location for the shipment.
* **Date**: The date associated with the order line (e.g., order date, shipment date).
* **WeightKg**: The weight of the items in this order line, specified in kilograms, with a validation rule ensuring it's between 0.1 and 10000 kg.
* **Status**: The current status of the order line, defaulting to "Pending".

The attributes like [Required], [ForeignKey], [StringLength], [DataType], [DisplayFormat], and [Range] are data annotations used by ASP.NET Core for validation, database mapping, and UI display purposes.



# Figure: Orderline Model Class

### **TransportUnit.cs**

TransportUnitID: A unique identifier for each transport unit.

LorryID & Lorry: Foreign key and navigation property to link to a Lorry object (the vehicle). A transport unit *must* have a lorry.

DriverID & Driver: Foreign key and navigation property to link to a Driver object (the person driving). A transport unit *must* have a driver.

AssistantID & Assistant: Foreign key and navigation property to link to an Assistant object (the helper). A transport unit *must* have an assistant.

Container: A string property to describe or identify the container used for goods, with a maximum length of 100 characters.

Status: A string property indicating the current state of the transport unit (e.g., "Available", "In Transit", "Maintenance"), with a maximum length of 50 characters.

A screenshot of a computer program

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Figure: TransportUnit.cs

# Controllers

There are eleven controllers in this project. Most of them have same basic structure. The following are some unique controllers.

## **Driver Controller**

This DriversController.cs file is a C# controller in an ASP.NET Core web app. It manages driver records in a logistics system. Here's a simple explanation of what it does:

**Access Control**

* Only users with **Manager and Admin role** can use this controller ([Authorize(Roles = "Manager,Admin")]).

**Functions**

1. **Index**
   * Shows a list of drivers.
   * You can search by name or phone.
2. **Details**
   * Shows detailed info of a driver by ID.
3. **Create (GET + POST)**
   * GET: Shows the form to add a new driver.
   * POST: Saves new driver to the database.
4. **Edit (GET + POST)**
   * GET: Shows the form to edit a driver.
   * POST: Updates driver info in the database.
5. **Delete (GET + POST)**
   * GET: Shows a confirmation page to delete a driver.
   * POST: Deletes the driver from the database.

**Helper**

* DriverExists: Checks if a driver exists by ID.

The Index action method in the DriversController which shows a list of drivers and includes a search feature. First, it saves the search keyword (searchString) into ViewData so the search box can remember the user's input. Then, it gets all drivers from the database. If the user typed something in the search box, it converts that keyword to lowercase for case-insensitive searching. It filters the drivers whose name or phone number (also converted to lowercase) contains the keyword. Finally, it sends the filtered (or full) driver list to the view.

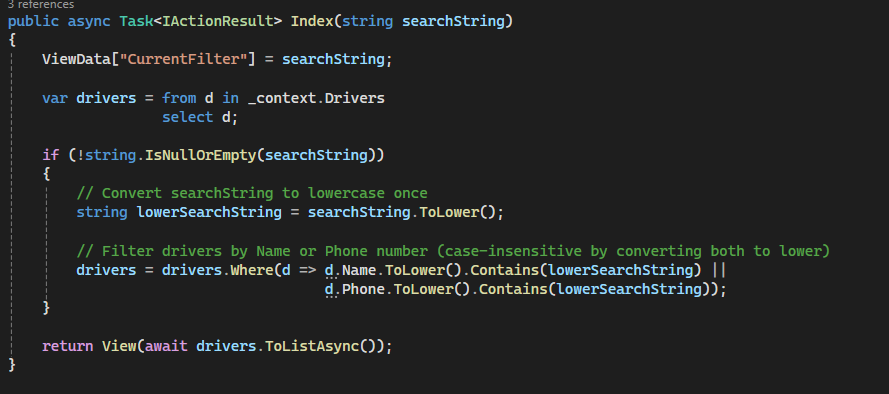


Figure: Driver search method

## **UserController**

This UsersController manages user accounts in an ASP.NET web app. Only users with the "Admin" or "Manager" role can access it. It lets you view a list of users, search them by name, email, or phone, and see their roles. You can also view details of one user, update their phone number, and change their roles (add or remove). It also supports deleting a user. The controller uses UserManager and RoleManager to manage user accounts and their roles.

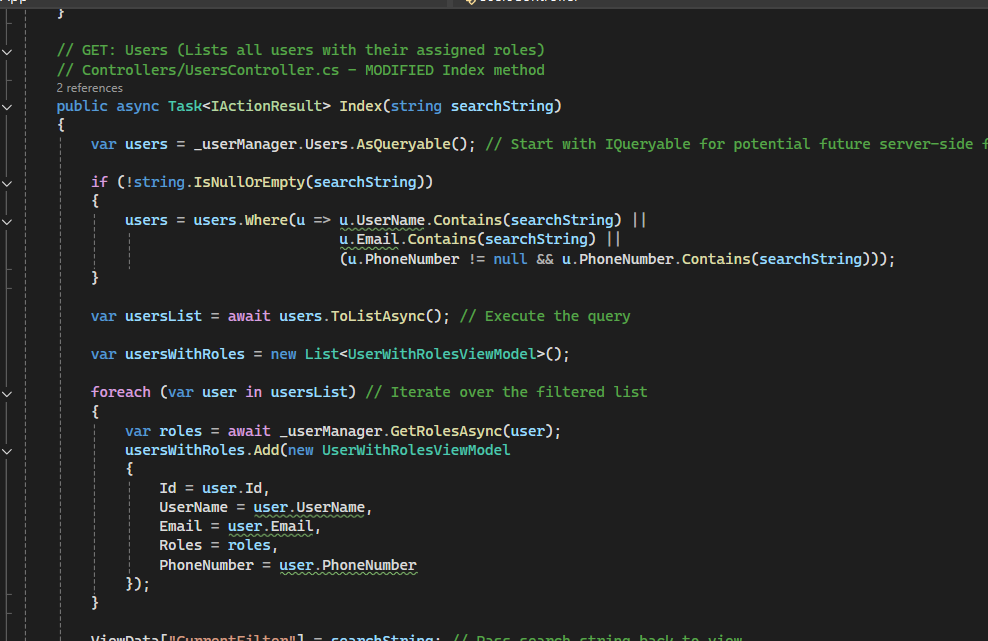


Figure: User Search Method