

## PROGRAMMING 2B PART 1

|                     |                 |
|---------------------|-----------------|
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| Module Code:        | PROG6212        |
| Date of Submission: | 15-09-2025      |

I hereby declare that I did not plagiarise the content of this assignment and that this is my own work.

Assignment submitted via Turnitin: ☒ (Tick the Box)

## 1. The Documentation:

For the academics who serve as independent contractors (ICs), the Contract Monthly Claim System (CMCS) is an important tool for improving the difficult task of submitting and approving monthly claims (Microsoft, 2023). The CMCS provides you with hands-on training with C# programming and .NET GUI development which bases itself on real-world workplace incidents (Microsoft, 2023).

Bases on its dual purpose as an academic project and a functioning system, CMCS is created to help students improve their software development skills while solving real-world problems at the same time (Microsoft, 2023).

### The explanation of design choices:

The User-Centric Design provides easy-to-use navigation and extra features for submitting claims and reviewing them (Emma, 2024) Thus, benefitting academic managers, program coordinators, IC professors and lastly users with disabilities (Emma, 2024). Many user groups can benefit from this design:

- Academic managers (Emma, 2024) .
  - The program coordinators (Emma, 2024).
  - The lecturers, known as the independent contractors (IC) (Emma, 2024).
  - Users that need accessibility (Emma, 2024).
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- Security: the system will use encryption to protect sensitive information, especially personal information and finances (Frontegg, 2024). A Role-based access control as well as multi-factor authentication are going to be applied to simply protect user accounts and the claims will be reviewed by the lecturers, program coordinators and the academic management for safety reasons (Frontegg, 2024).

- Scalability and Maintainability: multiple databases that have front-end and back-end features are built into the CMCS system that ensure scalability and maintainability by carrying out easy upgrades and fast integration of new features (Ram, 2023).

### The Database Structure:

The relational model that is used in the database supports SQL servers, and it's supported in .NET systems (Microsoft learn, 2024). The structure includes many important tables:

- Users: this table uses the user's username, password, user\_id and position (Manager, Coordinator or Lecturer) which is stored for system management needs (Microsoft learn, 2024).
- Lecturers: this table uses the lecturer's ID, first name and surname, hourly rate and the link to the Users table via the user ID (Microsoft learn, 2024). Organized and easy to access lecturer-specific data (Microsoft learn, 2024).
- Claims: this table stores the lecturer claims by creating a connection with the Lecturers database via Claims\_id (Microsoft learn, 2024). Given that it has all the lecturer's data like the month, year, hours worked as well as the status (Submitted, Reviewed, Approved and Rejected) (Microsoft learn, 2024).
- Supporting Documents: the documents correspond to the claim support and is tracked on this table (Microsoft learn, 2024). The foreign Key connects the document to the Claims table and each one is identified by the document\_id (Microsoft learn, 2024).

- Approval: this table contains the claim approval information with the approval\_id (Microsoft learn, 2024). It contains the approval date; approver comments and the foreign keys connected to the Claims and Users tables (Microsoft learn, 2024).

#### Assumptions:

- Academic institutions are meant to use the CMCS to handle claims from independent contractors (IC) (Indeed, 2025).
- The lecturers are then paid every month based on the hours they worked (Indeed, 2025).
- Users should have: basic computer skills, relevant to having experience in web applications (Indeed, 2025).
- Before completing the final approval, the claims will be constantly reviewed by the managers and coordinators (Indeed, 2025).

#### Constraints:

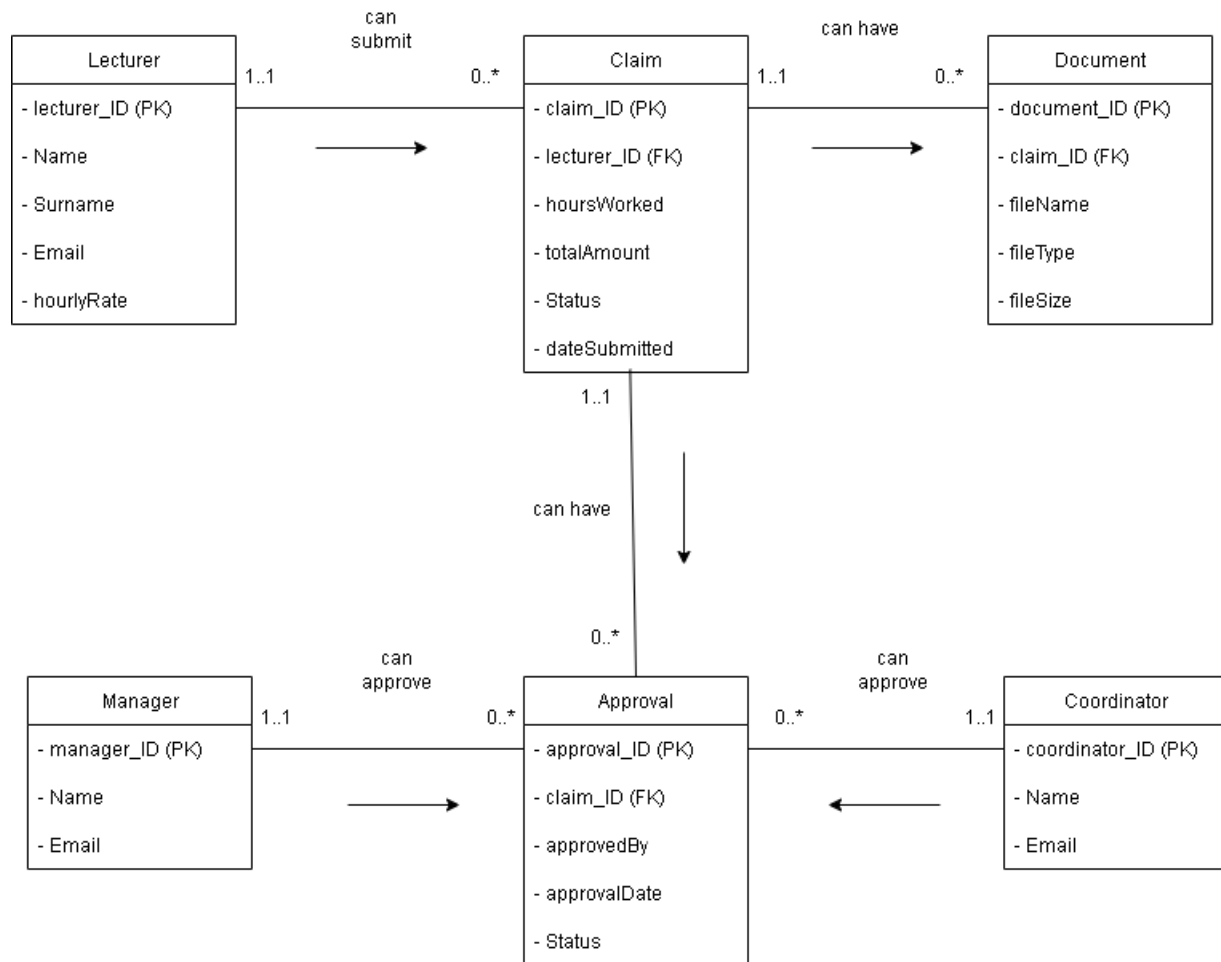
- In order to protect the financial data and the personal data, the system must comply with data protection laws such as the GDPR (Microsoft Security, 2025).
- It must be able to handle large amounts of claims, especially at the end of the month (Microsoft Security, 2025).
- Accessibility needs to be ensured for all users, across all devices, including those with disabilities (Microsoft Security, 2025).
- Users in low-coverage areas have limitations by how much they depend on reliable internet connection (Microsoft Security, 2025).

#### Conclusion:

The Contract Monthly Claim System (CMCS) improves the administrative process by reducing the handling of claims thanks to its simple to use interface (Microsoft learn,

2015). It provides C# development training, improving the students' skills and tackling real-world problems in the evolving software development sector (Microsoft learn, 2015).

## 2. The UML Diagram:



(Microsoft support, 2025)

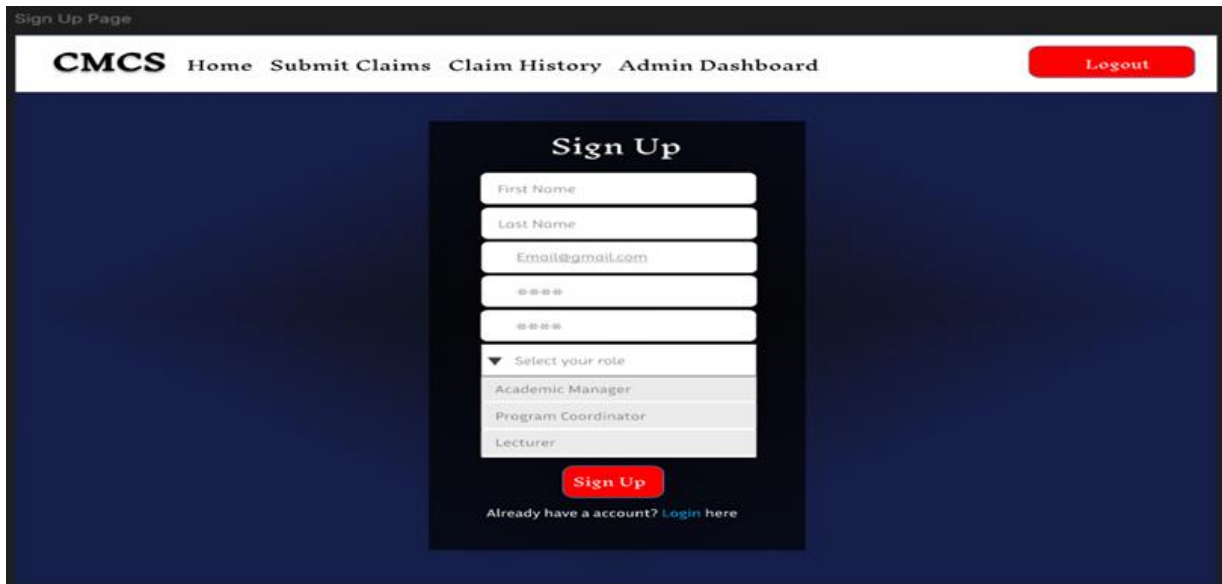
### 3. The Project Plan:

| Phase  | Dates                       | Tasks   | Dependencies       | Deliverables                              |
|--|-----------------------------|---|--------------------|---|
| <b>Phase 1: Documentation &amp; Planning</b>         | 4 Sept 2025 – 15 Sept 2025  | <ul style="list-style-type: none"> <li>• Define project scope</li> <li>• Identify user roles (Admin, Coordinator, Manager, Lecturer)</li> <li>• Gather requirements</li> <li>• Sketch rough drafts of GUI</li> </ul>                                  | None               | Draft of the System Design Document (SDD) |
| <b>Phase 2: Project Refinement &amp; UML</b>         | 16 Sept 2025 – 22 Sept 2025 | <ul style="list-style-type: none"> <li>• Create UML class diagram</li> <li>• Align UML with GUI</li> <li>• Update and refine project plan</li> </ul>  | Phase 1            | UML Diagram and updated project plan      |
| <b>Phase 3: GUI Prototype Design</b>                 | 23 Sept 2025 – 20 Oct 2025  | <ul style="list-style-type: none"> <li>• Create GUI prototypes:</li> <li>• – Sign-up page</li> <li>• – Login page</li> <li>• – Home page</li> <li>• – Submit Claims page</li> <li>• – Claim History page</li> <li>• – Admin Dashboard page</li> </ul> | Phases 1 & 2       | Completed GUI prototype                   |
| <b>Phase 4: Prototype Testing &amp; Refinement</b>   | 21 Oct 2025 – 5 Nov 2025    | <ul style="list-style-type: none"> <li>• Test workflow and navigation</li> <li>• Identify and fix problems</li> <li>• Improve usability</li> </ul>  | Phase 3            | Refined prototype                         |
| <b>Phase 5: Final Documentation &amp; Submission</b> | 6 Nov 2025 – 15 Nov 2025    | <ul style="list-style-type: none"> <li>• Write final report</li> <li>• Proofread documentation</li> <li>• Compile and submit POE</li> </ul>   | All earlier phases | Final POE submitted                       |

(Awati, 2024)

#### 4. The GUI/UI:

Figure 1: Sign Up Page



The Sign Up Page features a dark blue background. At the top, a white navigation bar contains the CMCS logo and links to Home, Submit Claims, Claim History, and Admin Dashboard. A red Logout button is positioned on the right. The main content area is a dark blue rectangle with a white 'Sign Up' title. Below the title are five input fields: First Name, Last Name, Email (pre-filled with 'Email@gmail.com'), and two password fields (each with a strength indicator). A dropdown menu for 'Select your role' lists Academic Manager, Program Coordinator, and Lecturer. A red Sign Up button is at the bottom, followed by a link to 'Login here' for existing users.

Sign Up Page

CMCS Home Submit Claims Claim History Admin Dashboard Logout

### Sign Up

First Name

Last Name

Email@gmail.com

•••••

•••••

▼ Select your role

Academic Manager

Program Coordinator

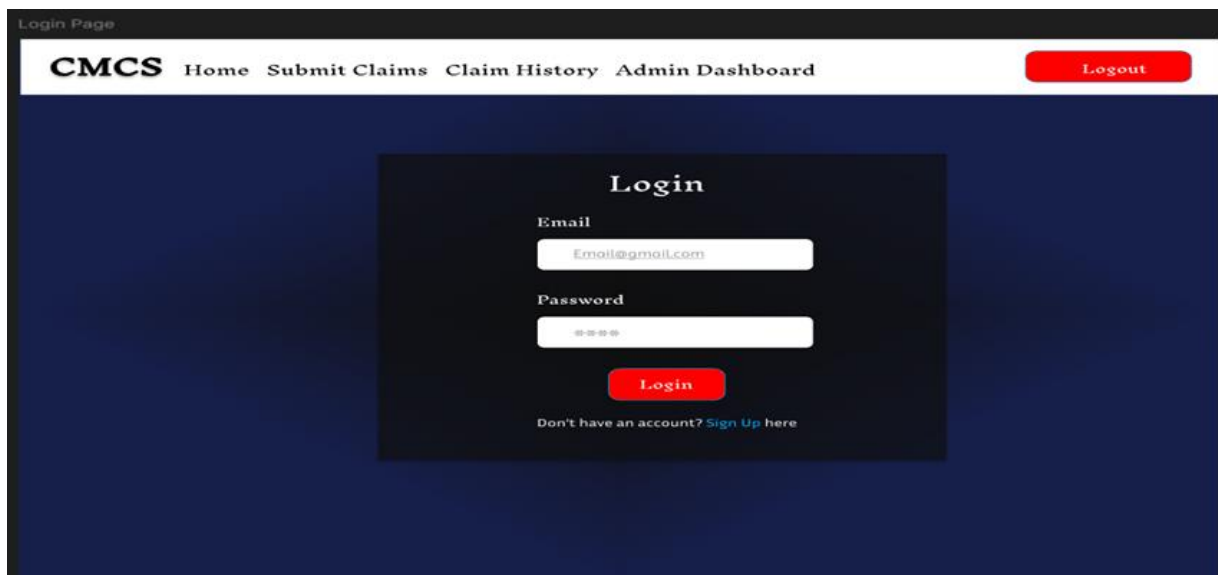
Lecturer

Sign Up

Already have a account? [Login here](#)

(Figma, 2025)

Figure 2: Login Page



The Login Page features a dark blue background. At the top, a white navigation bar contains the CMCS logo and links to Home, Submit Claims, Claim History, and Admin Dashboard. A red Logout button is positioned on the right. The main content area is a dark blue rectangle with a white 'Login' title. Below the title are two input fields: Email (pre-filled with 'Email@gmail.com') and Password (masked with '•••••'). A red Login button is at the bottom, followed by a link to 'Sign Up here' for new users.

Login Page

CMCS Home Submit Claims Claim History Admin Dashboard Logout

### Login

Email

Email@gmail.com

Password

•••••

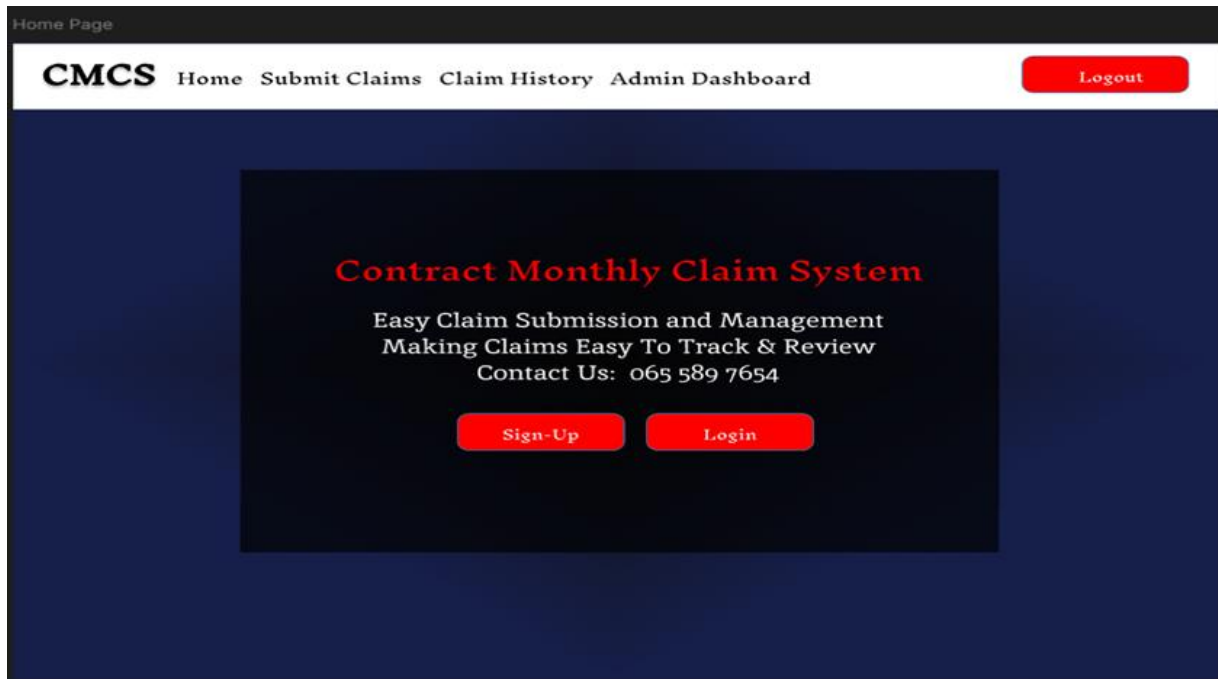
Login

Don't have an account? [Sign Up here](#)

(Figma, 2025)

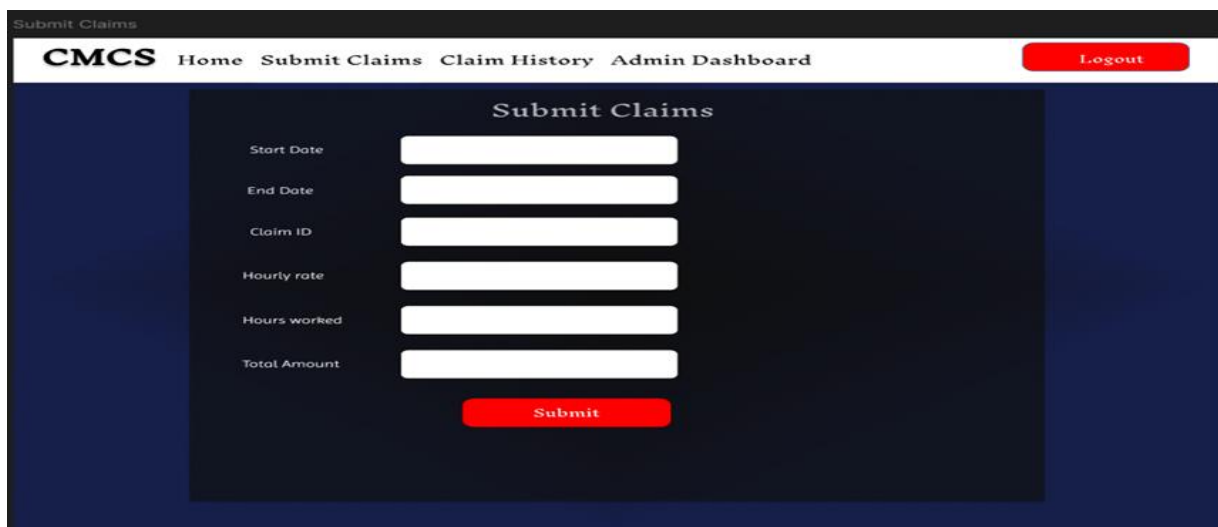


Figure 3: Home Page



(Figma, 2025)

Figure 4: Submit Claims Page



(Figma, 2025)

Figure 5: Claim History Page

Claim History

CMCS Home Submit Claims Claim History Admin Dashboard Logout

| Claim ID | Date Submitted | Amount  | Claim Date              | Status   |
|----------|----------------|---------|-------------------------|----------|
| 1        | 20/08/2024     | R20,000 | 20/08/2024 - 25/08/2024 | Approved |
| 2        | 22/08/2024     | R40,000 | 22/08/2024 - 27/08/2024 | Pending  |
| 3        | 25/08/2024     | R60,000 | 25/08/2024 - 30/08/2024 | Rejected |
| 4        | 29/08/2024     | R50,000 | 29/08/2024 - 05/09/2024 | Approved |
| 5        | 04/09/2024     | R30,000 | 04/09/2024 - 10/09/2024 | Pending  |

(Figma, 2025)

Figure 6: Admin Dashboard Page

Admin Dashboard

CMCS Home Submit Claims Claim History Admin Dashboard Logout

| Claim ID | Date Submitted | Amount  | Claim Date              | Status         |
|----------|----------------|---------|-------------------------|----------------|
| 1        | 20/08/2024     | R20,000 | 20/08/2024 - 25/08/2024 | Approve Reject |
| 2        | 22/08/2024     | R40,000 | 22/08/2024 - 27/08/2024 | Approve Reject |
| 3        | 25/08/2024     | R60,000 | 25/08/2024 - 30/08/2024 | Approve Reject |
| 4        | 29/08/2024     | R50,000 | 29/08/2024 - 05/09/2024 | Approve Reject |
| 5        | 04/09/2024     | R30,000 | 04/09/2024 - 10/09/2024 | Approve Reject |

(Figma, 2025)

GitHub Link:

[https://github.com/ST10085639/PROG6212\\_Part1](https://github.com/ST10085639/PROG6212_Part1)

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