

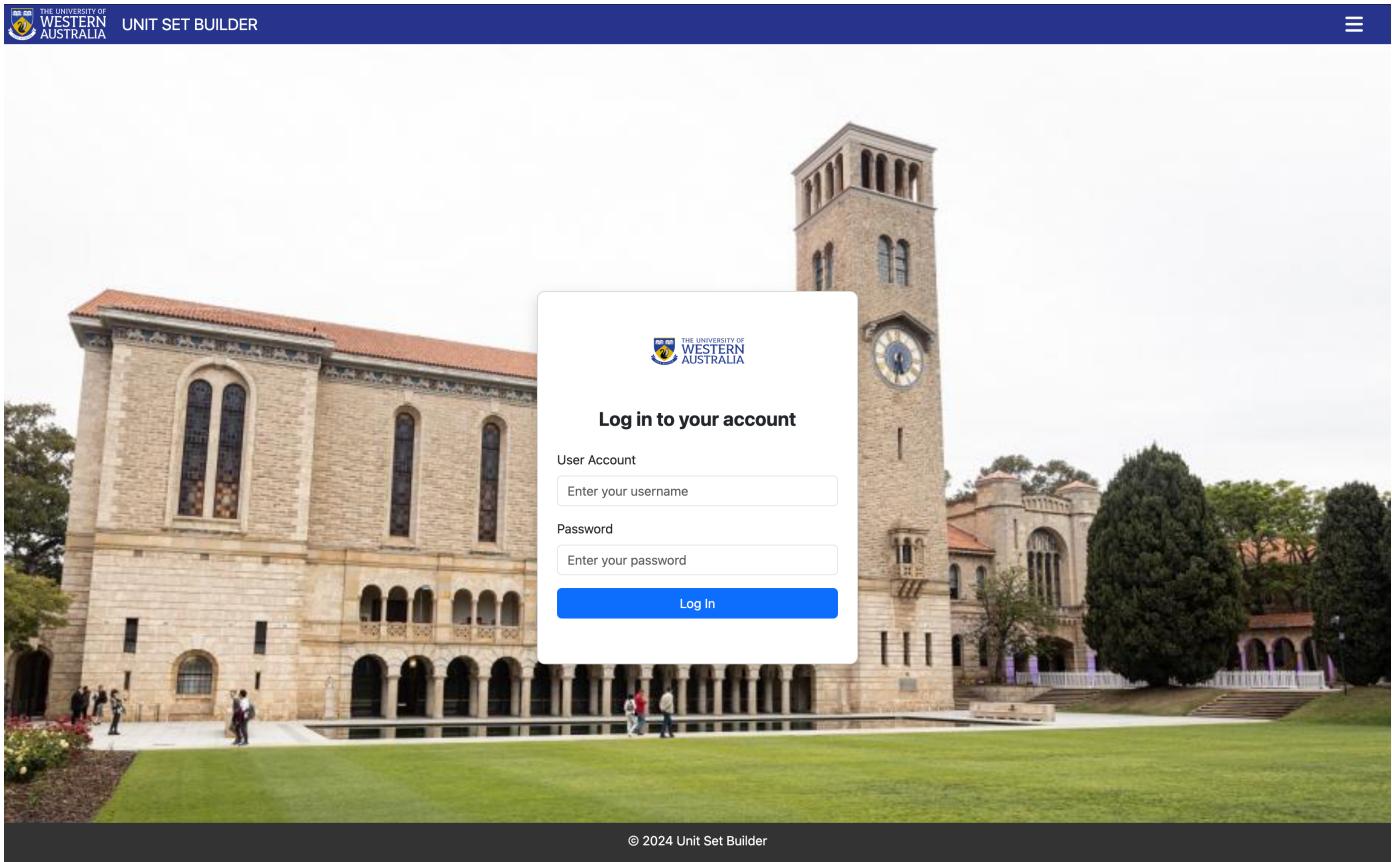
CITS5206-Team16-UnitSetBuilder

Information Technology Capstone Project - Unit Set Builder - Team 16

Front End

1. Log in

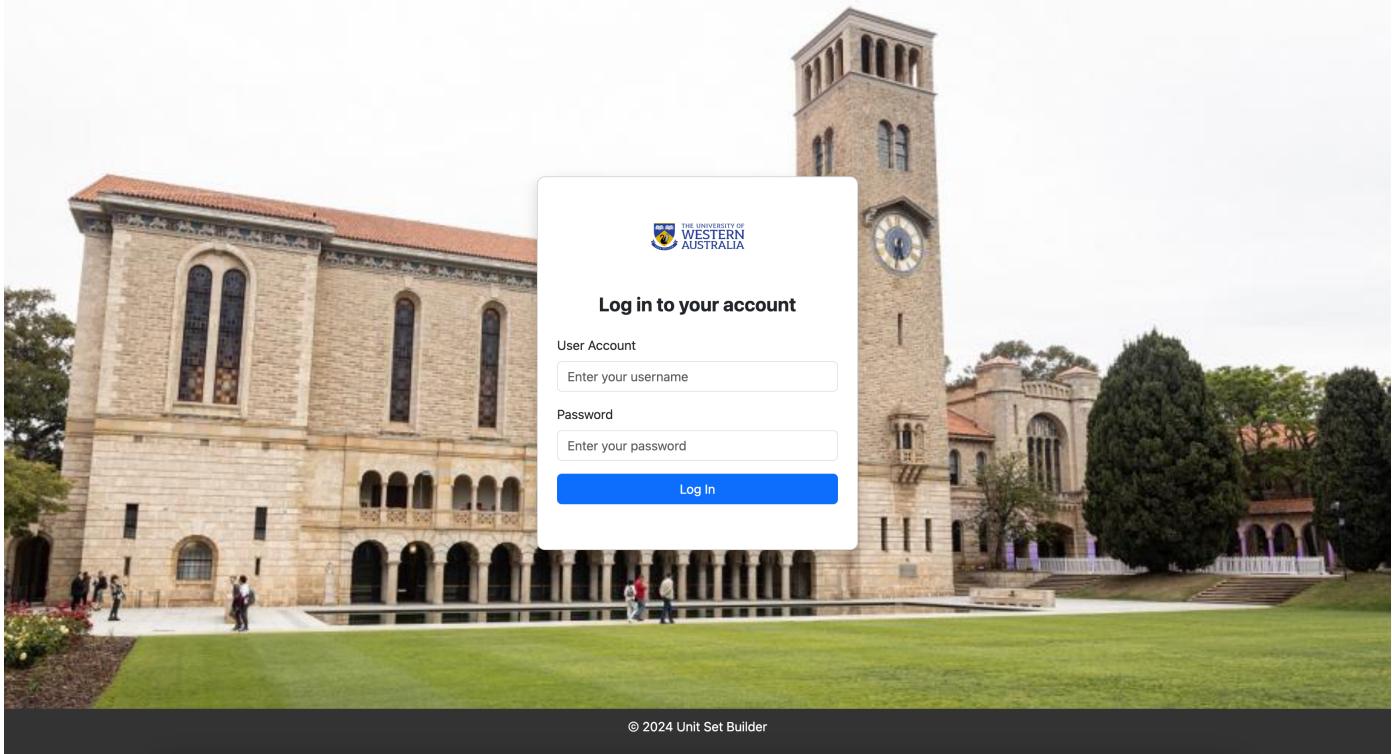
When opening the Unit Set Builder system, the first page displayed is the login page. Users are required to enter their username and password to access their accounts.



- 1. Enter Username:** Input the registered username in the "Enter your username" field. (The default admin user name is "test")
- 2. Enter Password:** Provide the corresponding password in the "Enter your Password" field. The password will be masked for security. (The default admin password is also "test")
- 3. Click Log In:** Click the blue "Log In" button to submit the credentials and proceed to the system. The page will then jump to the homepage.

2. Navigation Menu Instructions

The dropdown navigation menu provides quick access to different sections of the Unit Set Builder system. Clicking on each option will jump to the corresponding page:



Home: Takes users to the homepage. The menu can be accessed by clicking the three horizontal lines icon in the top right corner.

3. Home Page

On the Home page users get a greeting message based on the time of day.

Good Afternoon ! Hope your day is going well ! *

There is some information related to the app displayed on the home page with a Create Unit Set Builder button. On clicking the button, user is able to start the process of creating a unit set for the course and go through the different stages of the process.

Welcome To The Unit Set Builder App

Curriculum Management System (CAIDI) is a platform designed to streamline the administration of academic programs. The Unit Set Builder app is a user friendly experience for one of the complex component of Caidi.

Key features of Unit Set Builder typically include:

- **Course Management:** Simplifying the process of creating and modifying course offerings, creating sequences and unit sets.
- **Reporting and Analytics:** Generating insights into curriculum effectiveness, course offerings and structure.
- **Curriculum Mapping:** Ensuring courses align with institutional learning outcomes and goals.

Overall, the Unit Set Builder app enhances the educational experience by streamlining administrative processes and fostering better communication among faculty and students.

[Create A Unit Set Builder >>](#)

4. Select Course Page

1) Step Path Instructions

The step path displayed below the navigation bar shows the current progress in the Unit Set Builder process. The active step is highlighted in the path, and the user's progress is clearly indicated.



2) Select Course Instructions

After logging in, the system redirects to the course selection page, located on the homepage. This page allows users to search for available courses and begin building their unit set.

A screenshot of a course selection interface. At the top is a search bar with the placeholder "Search for a Course". Below it is a table with columns labeled "Type", "ID", "Code", "Title", and "Status". A large, empty rectangular area is positioned between the table and a blue button at the bottom center labeled "Create Grouping →".

3) Search for a Course

In the search bar, input the course name or keyword. As the keyword is typed, a dropdown list will appear, displaying all courses that match the entered keyword.

information				
Type	ID	Code	Title	Status
Graduate Certificate in Building Information Modelling				
Graduate Diploma in Building Information Modelling				
Graduate Diploma in Building Information Modelling				
Graduate Diploma in Building Information Modelling (Online)				
Master of Building Information Modelling				
Master of Building Information Modelling (Online)				
Graduate Certificate in Business Information and Logistics Management				
Master of Business Information and Logistics Management				
Graduate Certificate in Information Technology				
Graduate Diploma in Information Technology				
Master of Information Technology				
Master of Geographic Information Science				

[Create Grouping →](#)

4) Add Course to Form

In the dropdown list, click the green "+" button on the right side of the desired course. This action will add the selected course to the form below.

The selected course, including its type, ID, code, title, and status, will now appear in the form below the search bar. Multiple courses can be added if necessary.

information				
Type	ID	Code	Title	Status
Graduate Certificate in Building Information Modelling				
Graduate Diploma in Building Information Modelling				
Graduate Diploma in Building Information Modelling				

5) Manage Course Selection

The form can be modified. In the "Type" column, if the icon appears as a pencil, it means the course can be added; if it shows a red "X," the course cannot be added. Click the trash bin icon in the "Status" column to remove the course from the list.

Type	ID	Code	Title	Status
	85	25240	Graduate Diploma in Building Information Modelling	<input type="checkbox"/>
	88	25340	Graduate Diploma in Building Information Modelling	<input type="checkbox"/>

6) Confirm and Select Optional Courses

After confirming that the optional course is available for selection, the white checkbox on the left side of the "Status" column can be clicked to select it. Once the selection is made, clicking the large blue "Create a Unit Set Builder" button at the bottom will lead to the grouping page.

Type	ID	Code	Title	Status
	85	25240	Graduate Diploma in Building Information Modelling	<input checked="" type="checkbox"/>

Create Grouping ➔

5. Grouping Page

The grouping page displays the name of the course at the top and provides the user an option to create a group using Additional Grouping, Specialization and Year buttons.

SELECT COURSE ① GROUPING ② UNIT SET ③

MASTER OF INFORMATION TECHNOLOGY [62510]

Add A New Group

Select the group you want to add:

Additional Grouping + Specialization + Year +

There is a default group for each course already present on the page which will be there always. The user can edit this default group and add the unit sets for it. The user also has an option to download the course structure.

Master of Information Technology [62510] Preview ↗

≡ Master of Information Technology Unit Set
Default description for the Unit Set of Master of Information Technology.

Edit ↗

If the user wants to add a specialization group, then user will click on Specialization button and then the popup will be displayed to select the existing specialization or create a new specialization.

If the user selects, select existing specialization then field will be displayed to select the existing specialization. The user can search the specialization in the field below and add it to the course.

If the user wants to create a new specialization, then the user can enter the specialization details in the popup below.

On adding the specialization through one of the above methods, the user gets an option to edit and delete the group created on the Grouping page

On clicking the edit button user will be navigated to unit set page.

6. Unit set checklist Page

The Unit Set Checklist allows users to organize units by grouping them into different categories such as Core, Conversion, Option, and Customized. The checklist enables users to select, reorder, and remove units within each section, providing flexibility in organizing academic plans.

- Course Title Display:** The page displays the specific course at the top, showing the user which unit set they are managing (e.g., "Master of Information Technology: Artificial Intelligence (AI) Stream").

Unit Set checklist

Master of Information Technology: Artificial Intelligence (AI) Stream

2. **Group Selection Buttons:** Users can add a section to their checklist by clicking on one of the following buttons: **Core, Conversion, Option, Customized**

Select the Group you want to add:

Core

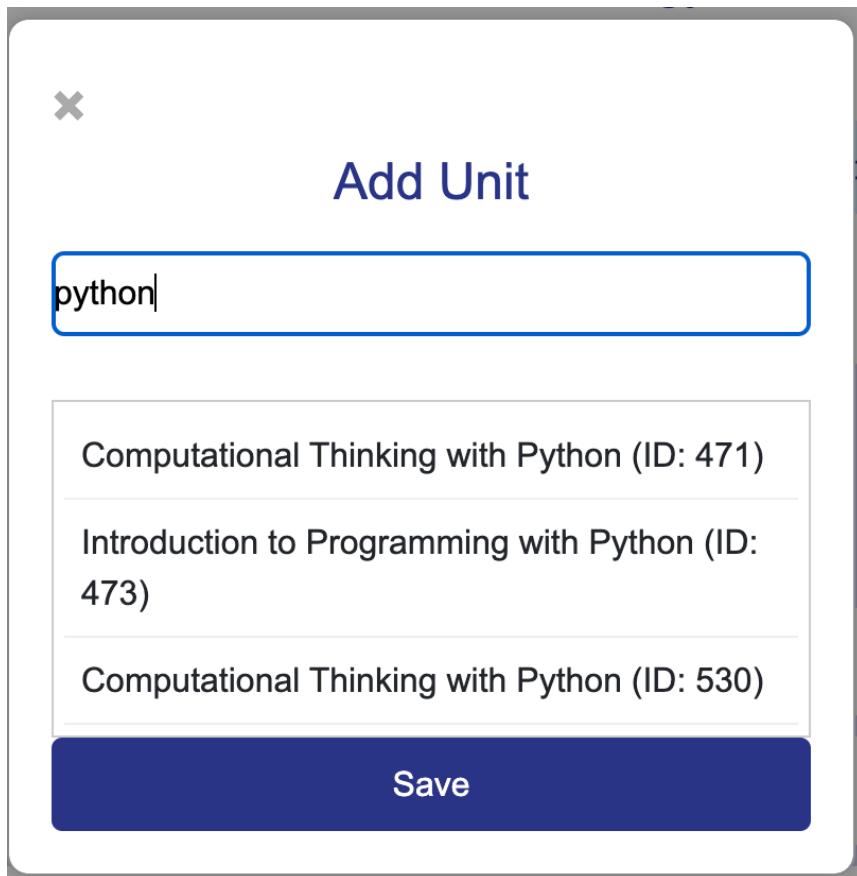
Conversion

Option

Customised

Once a button is clicked, a corresponding section will be generated with default units or an empty list to populate.

3. **Search and Add Units:** Each section allows users to add units using a search bar. Units can be searched by their names or codes and added directly to the selected section.



4. **Unit Management:** Users can manage individual units within each section:

Star: Mark a unit as a stared by clicking star icon.

Reorder: Change the order of units using drag-and-drop functionality.

Delete: Remove a unit from the section.

The screenshot shows a software interface with two course sections. The first section is "CITS4401 Software Requirements and Design". It has three icons at the end of its row: a list icon, a yellow star icon, and a red minus sign icon. The second section is "CITS5206 Information Technology Capstone Project". It also has three icons at the end of its row: a list icon, a yellow star icon, and a red minus sign icon.

5. **Section Management:** Sections can also be managed as a whole:

Reorder Section: Users can reorder entire sections by dragging the section's reorder icon.

Delete Section: Users can remove the entire section and its contents by clicking the delete icon.

Edit Section: Edit the section's description by clicking the pencil icon

A screenshot of the Unit Set Builder interface. At the top left, it says "option unit". Below that is a button "Take all units from this group (18 points) /". To the right is a blue circular icon with three horizontal lines and a plus sign. The main area contains three sections, each with a title, ID, and control icons. The first section is "Computational Thinking with Python (ID: 471)". The second is "Computer Analysis and Visualisation (ID: 479)". The third is "Computer Networks (ID: 482)". Each section has a blue circular icon with three horizontal lines and a minus sign to its right. At the bottom right of the main area is a small trash can icon.

7. Download Feature

The **Download Feature** allows university staff to generate and export a PDF version of the unit set they have created using the Unit Set Builder. This ensures that staff can save or share the finalized unit sets for academic programs. Follow the steps below to use this feature:

1. Preview the Unit Set:

Once the unit set is configured, navigate to the **Grouping Page** and click the "**Preview**" button. This will open a new page showing a preview of the unit set in **PDF format**.

A screenshot of the Grouping Page. At the top, there are three tabs: "SELECT COURSE ①" (green), "GROUPING ②" (blue), and "UNIT SET ③" (light blue). Below the tabs, the course is identified as "MASTER OF INFORMATION TECHNOLOGY [62510]". A section titled "Add A New Group" contains a dropdown menu "Select the group you want to add:" with options "Additional Grouping +", "Specialization +", and "Year +". Underneath, a list shows "Master of Information Technology [62510]" with a "Preview" button highlighted with a red box. Below it is a section for "Master of Information Technology Unit Set" with a "Default description for the Unit Set of Master of Information Technology." and "Edit" and "Delete" buttons. At the bottom, there is a section for "Data Science" with a "None" status, "Edit" button, and "Delete" button.

2. Real-time Updates:

If you make any changes to the units in the Unit Set Builder (such as adding or removing units), you can refresh the preview page to reflect the changes instantly.

The screenshot shows a web-based application for previewing a unit set. At the top, there are navigation icons for back, forward, search, and zoom (90%, +, -). On the right, there are download, print, and more options buttons. The main content area has a dark header with the title "Master of Information Technology". Below it, the course code "Course Code: 62510" and a description "Description: N/A" are shown. A section titled "Unit Sets:" lists the "Master of Information Technology Unit Set". The unit sets are categorized into four boxes: "core - None" (blue), "conversion - None" (pink), "option - None" (yellow), and "customised - None" (light blue). Each category contains a bulleted list of units and their credits. The "core - None" box contains four units: Cloud Computing (6), Software Testing and Quality Assurance (6), Relational Database Management Systems (6), and The Internet of Things (6). The "conversion - None" box contains two units: Academic Conduct Essentials (ACE) (0) and Logistics and Supply Chain Management (6). The "option - None" box contains three units: Computational Thinking with Python (6), Computer Analysis and Visualisation (6), and Computer Networks (6). The "customised - None" box contains two units: Machine Learning (6) and Deep Learning (6). Below the unit sets, a section titled "Specialisations:" lists "Data Science". The "Data Science" section follows the same structure, with a "customised - None" box containing three units: Big Data, Modelling and Meta-analysis in Biology, Conservation and the Environment (6), Data Storytelling (6), and Data Structures and Algorithms (6). There are also "option - None" (Geographic Information Systems Applications (6)), "conversion - None" (Software Engineering with Java (6) and Programming for Business (6)), and a final "core - None" box containing one unit: Decisions from Data in Agriculture (6).

Master of Information Technology

Course Code: 62510

Description: N/A

Unit Sets:

Master of Information Technology Unit Set

core - None

- Cloud Computing : 6
- Software Testing and Quality Assurance : 6
- Relational Database Management Systems : 6
- The Internet of Things : 6

conversion - None

- Academic Conduct Essentials (ACE) : 0
- Logistics and Supply Chain Management : 6

option - None

- Computational Thinking with Python : 6
- Computer Analysis and Visualisation : 6
- Computer Networks : 6

customised - None

- Machine Learning : 6
- Deep Learning : 6

Specialisations:

Data Science

customised - None

- Big Data, Modelling and Meta-analysis in Biology, Conservation and the Environment : 6
- Data Storytelling : 6
- Data Structures and Algorithms : 6

option - None

- Geographic Information Systems Applications : 6

conversion - None

- Software Engineering with Java : 6
- Programming for Business : 6

core - None

- Decisions from Data in Agriculture : 6

3. Download the PDF:

After reviewing the unit set, click the **Download** button on the preview page to export the PDF. This document can be saved or shared for internal reviews or record-keeping.

Backend

1. Application Objective

The Unit Set Builder aims to address the challenges faced by our client, whose current system is outdated and cumbersome to use. This application streamlines the management of course structures, enhancing the efficiency of daily operations. Key features of the Unit Set Builder include:

1. Login/Logout into website
2. Search courses
3. Create and manage course structure (known as Unit Set)
4. Create reusable specialisation where can be used by multiple courses
5. Drag and Drop to manage the structure of the course
6. Courses structure output to PDF format

2. Set up application locally

1. Git Clone

Using the HTTPS link retrieved from the project GitHub repository and run the following command in Terminal to clone project source code to your server or your local host machine.

```
git clone https://github.com/Tonyyzzz/CITS5206-Team16-UnitSetBuilder.git
```

2. Create python virtual environment

```
Python -m venv venv #Create new virtual env  
source venv/bin/activate # activate virtual env
```

3. Activate virtual environment

macOS/Linux

```
source venv/bin/activate
```

Windows

```
.\venv\Scripts\activate
```

3. Install Required Packages

```
pip install -r requirements.txt
```

4. Set up app configurations

```
echo FLASK_APP=app:create_app(\"development\") > .env
echo FLASK_ENV=development >> .env
```

5. Initialize and Migrate database

```
flask db init
flask db migrate -m "init"
flask db upgrade
```

6. Load existing data

```
flask loaddata
```

7. Launch Application

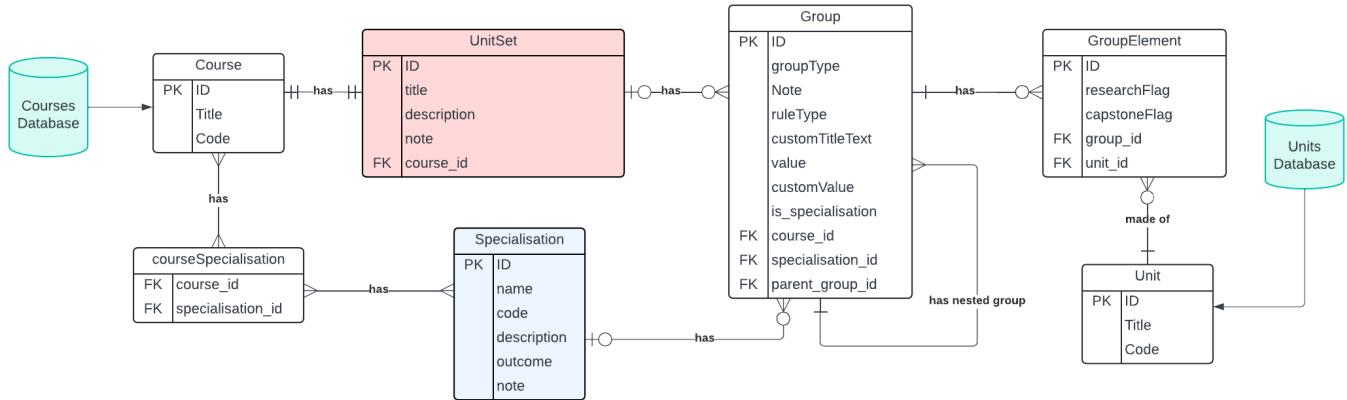
```
flask run
```

Enjoy the application!

3. Deployment

The application is currently deployed using [Heroku](#). To access the deployed website with this [link](#). After pushing to the main branch, Heroku will automatically detect the changes and start building the application.

Data Structure



Entities:

- Course**: Represents the overall course or degree program. It serves as the top-level entity in the system, managing the different programs offered.
- UnitSet**: Represents a set of units that form part of a course structure. It could include core units, electives, or any other unit grouping required for the course.
- Specialisation**: Represents a specialized track or focus within a course. It allows the system to define areas of concentration or expertise, such as a major or minor, that a student can pursue.

4. **Group:** Represents a grouping mechanism used to organize units within a unit set. This table is unique in that it supports nested group structures, allowing groups to contain other sub-groups, which facilitates complex course requirements (e.g., organizing units into core and elective groups).
 5. **GroupElement:** Represents individual components within a group, typically linking units to the group. It helps to manage how units are structured within different groups, allowing for flags like research-based or capstone project indicators.
 6. **Unit:** Represents an individual course unit or subject, forming the basic building block of the course structure. Units are linked to groups via group elements to ensure flexible course configurations.
7. **Note:**
- `flask load` command is used to load data into `Course`, `Unit` tables from existing data stored in `csv` file.