

# TIMETABLE VISUALIZATION

Faculty Of Applied Sciences  
University Of Sri Jayewardenepura

## User Manual of the Web Application



*Welcome to the User Manual for the Timetable Visualization Web Application developed using the R Shiny package. This application is designed to provide a visual representation of the First semester Timetable for the Faculty of Applied Sciences at the University of Sri Jayewardenepura. The application offers an easy and efficient way to access and analyze timetable data for 12 different departments.*

## APPLICATION OVERVIEW



*The timetable visualization app serves various individuals by simplifying schedule management, improving resource allocation, and enhancing communication. For students, it provides an organized view of lectures, ensuring efficient time management. Lecturers can schedule lectures in a way that avoids any overlaps with other ongoing lectures while administrators find it easier to coordinate events and allocate resources effectively. Ultimately, this app transforms complex schedules into user-friendly displays.*

## Accessing the Web Application



*To access the Timetable Visualization Web Application, open your web browser and enter the provided URL.*

## Dashboard Interface



*Upon accessing the application, users will be presented with a user-friendly dashboard interface. The dashboard consists of a header, a navigation bar, and a main body where the content is displayed*

- The horizontal menu bar at the top of the dashboard provides quick navigation to different sections of the application. Each menu option corresponds to a different view of the timetable data.
- Each tab contains panels that display specific visualizations and data related to the selected view.

## Privileges and Features



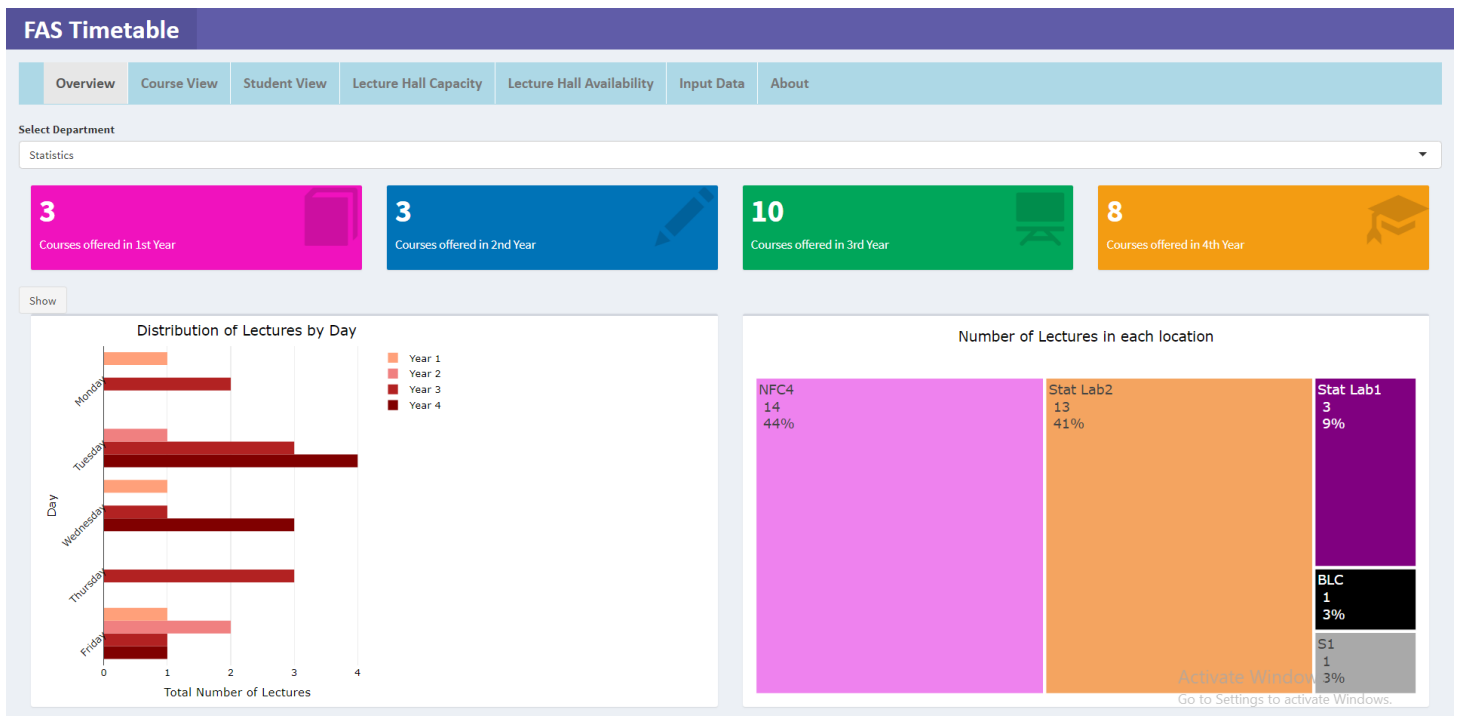
*The Timetable Visualization Web Application offers several privileges and features that enhance your experience with the application:*

- User friendly Visualization: Color-centric data visualization, panel separated data display.
- Selection option: The application allows various selection options; this enables customizing the view according to the user requirement.
  - Year: Choose the academic year wish to view.
  - Subject(s): Select one or multiple subjects to focus on.
  - Degree Type: Filter data based on the type of degree.
  - Departments: Explore timetable data for different departments.
  - Lecture Hall: Analyze data specific to a particular lecture hall.
  - Seating Capacity: Explore lecture halls with the required seating capacity
- Upload new data: User can have the privilege to upload new timetable data in CSV format. This allows users to update the application with data for different semesters.
- Download, Zoom and other options for visualization.

## OVERVIEW PANEL



*The "Overview" section provides an overview of the first semester Timetable. You can select a specific department and view key performance indicators (KPIs) and plots related to that department's timetable.*

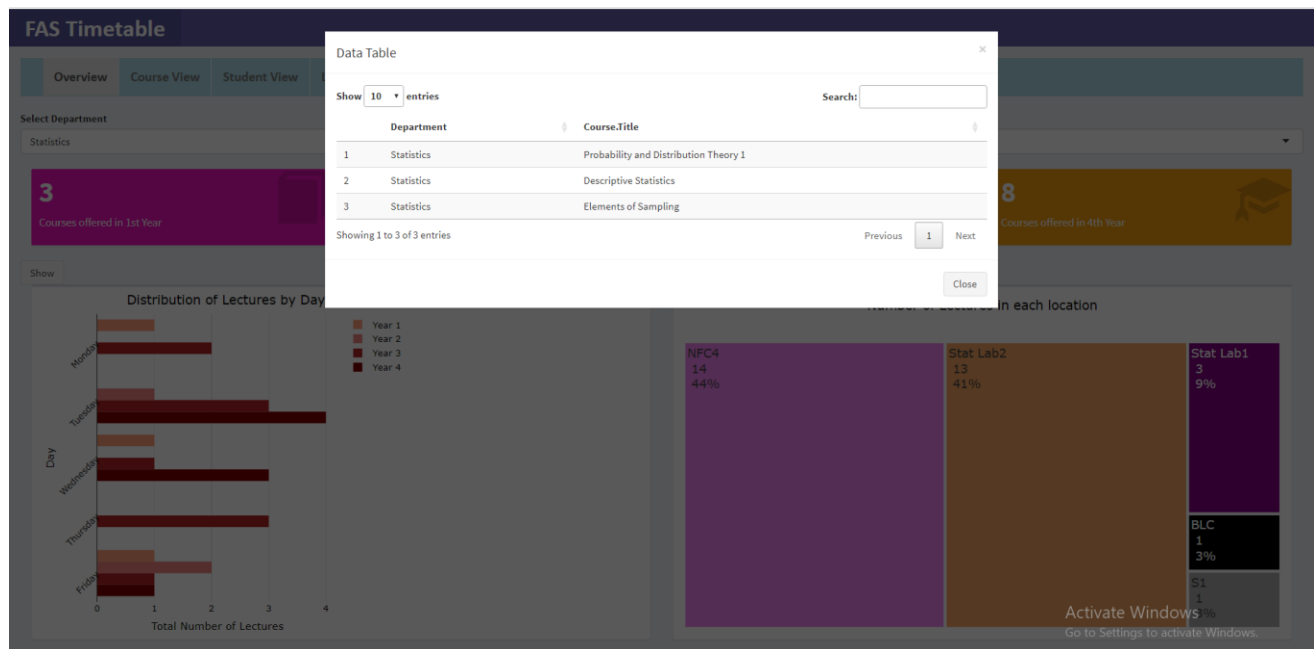


## Department Selection

*Upon entering the "Overview" panel, you'll find a department selection option. This feature lets you choose the specific department for which you want to view the data. By default, the application displays data for all departments, providing a holistic view of the entire faculty. (All departments)*

## Key Performance Indicators (KPIs)

*KPIs represents the number of courses offered in each academic year for the selected department. Additionally, the "Course View" panel enables you to explore KPI values. When you click on a particular KPI value (number of lectures), the application displays a detailed table of courses related to that KPI value. This table provides information about the courses, including their names and department.*



## Lecture Distribution by Day

*The application presents a clustered bar chart showing the number of lectures by day (Monday, Tuesday, Wednesday, Thursday, Friday) for each academic year. This visualization provides a clear comparison of lecture schedules across different years, facilitating better planning and allocation of resources.*

## Tree map: Location and Lecture Count

*The tree map showcases the number of lectures in each location within the selected department. The color-coded tree map lets you identify lecture count variations at different locations for the selected department. On the top of each tile in tree map, lecture counts in each location and the percentage is shown. This feature is useful for optimizing resource utilization and allocation based on lecture distribution.*

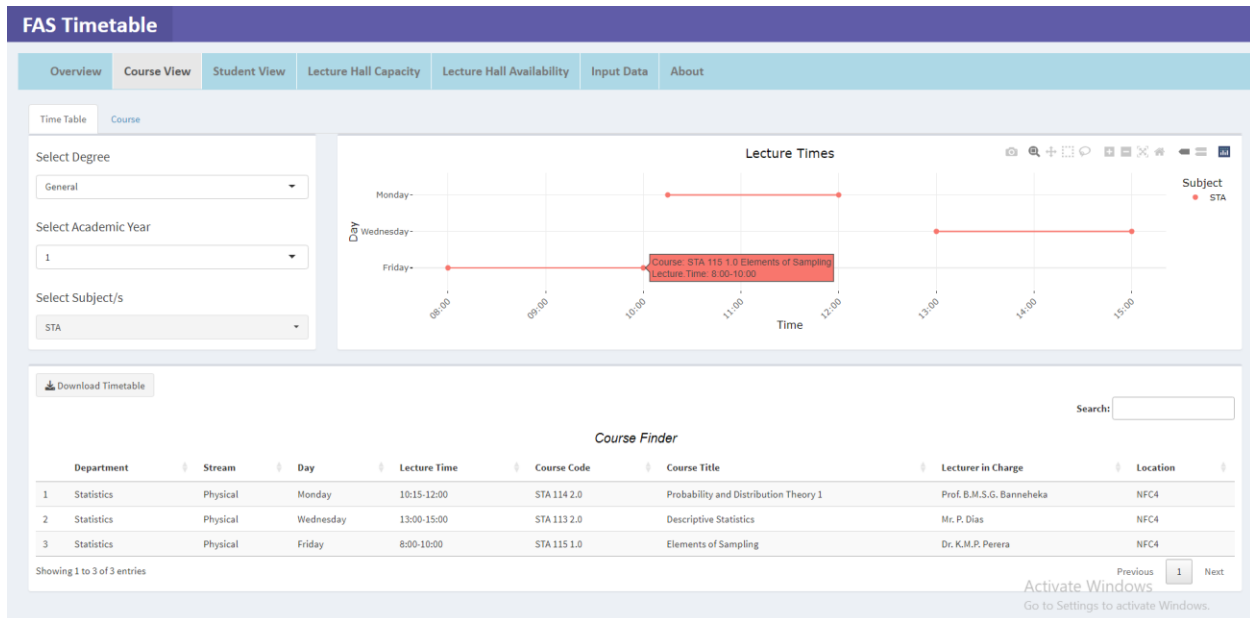
## COURSEVIEW PANEL



This section offers a comprehensive overview of the courses offered by different departments, allowing to explore the distribution of lectures and subjects.

The course view panel consists of two tabs named Timetable and Course.

### Timetable tab



### Lecture Time and Day Visualization

This feature allows user to choose various parameters to customize the view:

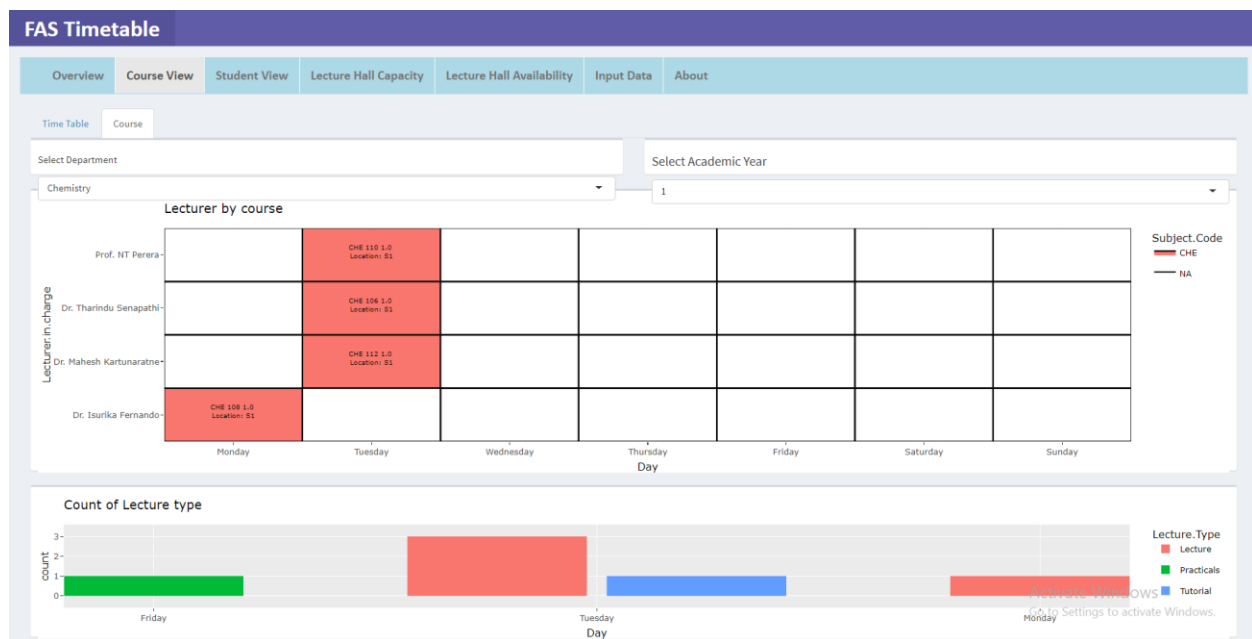
- Degree type: Choose the type of degree (Honors, General) that wish to explore.
- Academic Year: Select the academic year for which you want to analyze lecture schedules.
- Subject: Filter the data to focus on a specific subject

Based on your selections, the application generates a line graph visualization. This graph depicts the lecture times and corresponding days of the week for the chosen subject. When you click on a line you can view the course code and the lecture time. This visualization offers a clear representation of the subject's lecture schedule.

### Download Relevant CSV File

This panel offers the convenience of downloading the relevant CSV file for the selected data. With a simple click of a button, you can download the CSV file containing the lecture schedule data for the specific subject, department, day, lecture time, course code, course title, lecturer in charge and location.

## Course tab




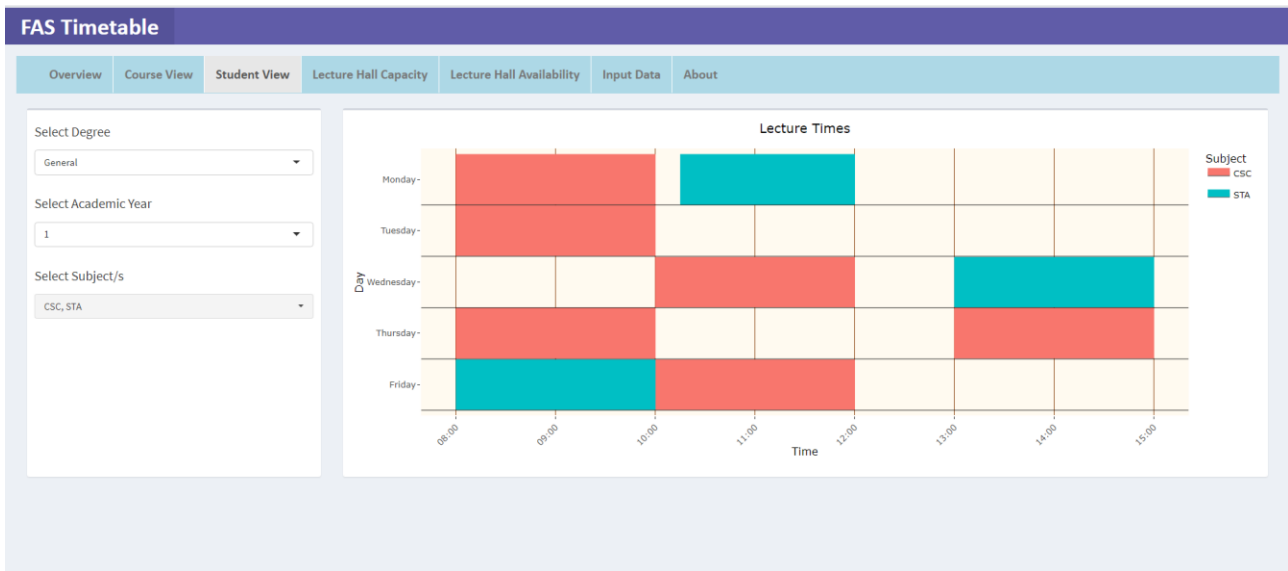
## Lecturer by Day Visualization

Once the user selects a department, the application generates a visualization that showcases the lecturer and their respective days of the week for each subject within the chosen department and academic year. This visualization provides a clear representation of who is responsible for conducting lectures for each subject and on which days those lectures are scheduled.

## Count of Lecture type Visualization

This visualization provides you with a breakdown of the different types of lectures conducted each day within the selected department. The visualization takes the form of a clustered bar chart, where each cluster represent a day of the week. Within each cluster, different bars represent the count of each lecture type (lectures, tutorials, practical) scheduled for that day.

 The students' view panel displays the availability status of students, allowing users to apply filters to select specific students for viewing.



In the student view panel user needs to choose various parameters to customize the view:

- Degree type: Choose the type of degree (Honors, General) that wish to explore.
- Academic Year: Select the academic year for which you want to analyze lecture schedules.
- Subject: Filter the data to focus on a specific subject/s

### Availability Visualization

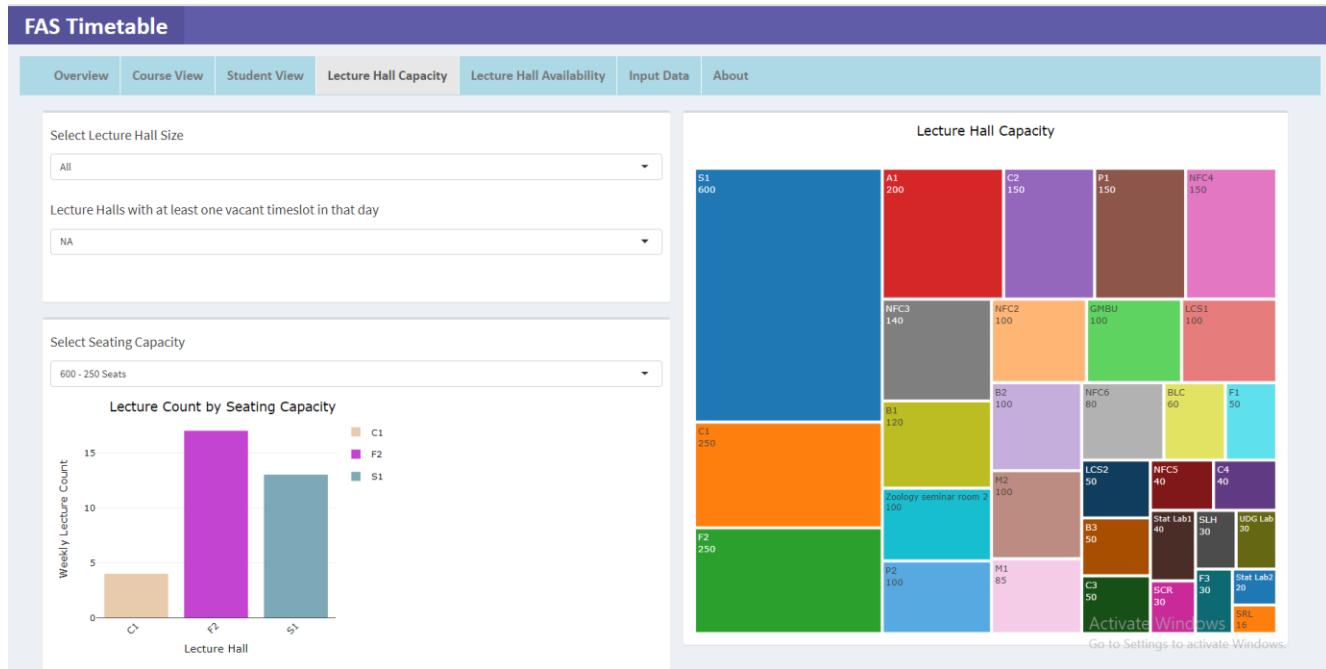
In the "Student View" panel, the application generates a detailed visualization of student availability. This visualization represents time slots using a grid-like arrangement, with each cell representing a specific time period during the week. The visualization is color-coded to as following:

- Colored Boxes: These indicate time slots when students are not available due to their course schedules. Each box is color-coded to denote a specific course.
- Background: The background color represents free time slots when students are available for classes.

By examining this visualization, you can quickly identify time periods when students are occupied with classes and when they have availability for additional courses or activities.

## LECTURE HALL CAPACITY PANEL

The lecture hall capacity panel provides information about the seating capacity of each hall and enables users to choose their desired seating capacity. Once selected, the panel displays the available halls that meet the chosen seating capacity criteria.



Upon entering the "Lecture Hall Capacity" panel, the user can find the capacity selection options. This feature allows user to choose the desired seating capacity category from the provided choices:

- Less than or equal to 50
- Less than or equal to 100
- Less than or equal to 150 Less than or equal to 200
- Less than or equal to 250
- All Lecture Halls

By selecting a specific capacity category, you can focus on lecture halls that match your seating capacity requirements.



## Tree map of Hall capacity

When the user chooses a seating capacity category, the app creates a tree map view. This view shows all lecture halls that match your chosen capacity. Lecture halls are displayed as colored rectangles in the tree map. Each rectangle represents a hall, and its size reflects the hall's seating capacity. This helps quickly see available halls with the capacity they want.

## Lecture Count by Seating Capacity

Users can select a specific number of seats required for a lecture hall from the drop-down box. The application will then generate a bar plot visualization that displays the weekly lecture count of all lecture halls with the entered seating capacity.

## Lecture Halls with at least one vacant timeslot

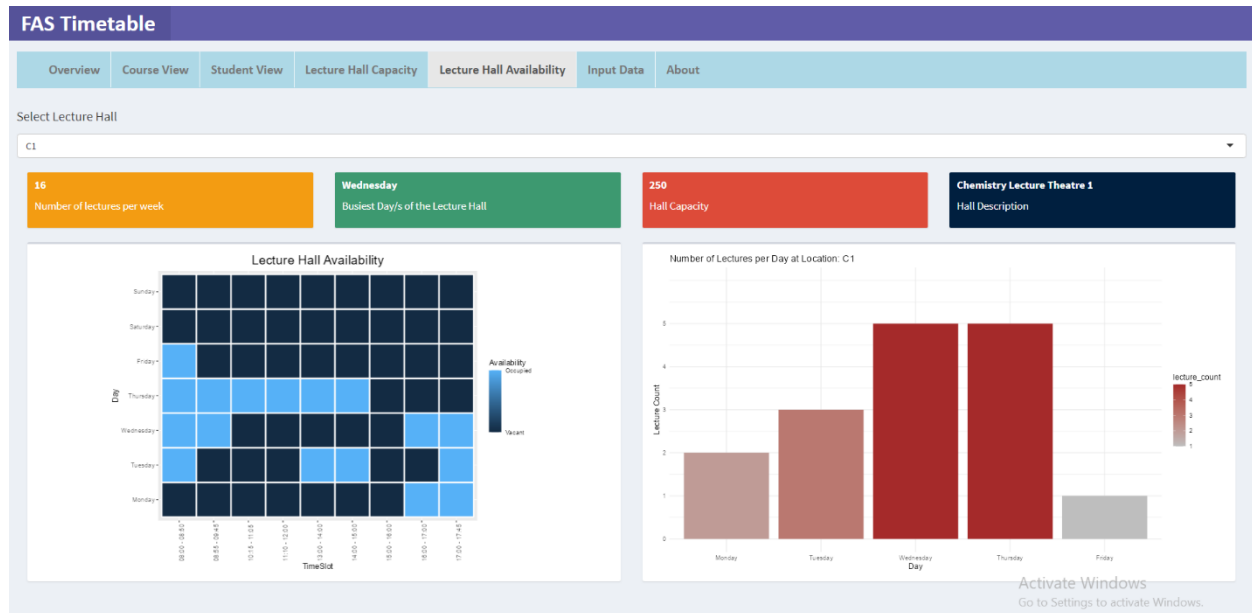
When you select a day from the drop-down box, it filters the tree map to only show the lecture halls with at least one time slot free in that day.

Example: suppose you choose Tuesday, then the tree map will be filtered so that it shows only the lecture halls with at least one vacant time slot on Tuesday. Using this filter, we can recognize the potential lecture halls an extra lecture can be held in.

## LECTURE HALL AVAILABILITY PANEL



The "Lecture Hall Availability" panel provides the availability of specific lecture halls. This section allows you to select a lecture hall, view key performance indicators (KPIs), and explore visualizations to understand lecture hall utilization.



Upon entering the "Lecture Hall Availability" panel, you'll find a lecture hall selection option. This feature enables you to choose a specific lecture hall for which you want to gather availability and usage information.

### Key Performance Indicators (KPIs)

The "Lecture Hall Availability" panel presents four essential KPIs that provide information about the selected lecture hall:

- **Weekly Lecture Count:** This KPI displays the total number of lectures scheduled in the selected lecture hall for the week.
- **Busiest Day:** This KPI indicates the day with the highest number of lectures in the selected lecture hall during the week.
- **Hall Capacity:** This KPI showcases the seating capacity of the selected lecture hall.
- **Hall Description:** This KPI provides a brief description or details about the selected lecture hall.

### Heat Map Availability Visualization

The heat map illustrates the availability of the selected lecture hall throughout the week. This heat map showcases availability by displaying each day of the week along the y-axis and time slots along the x-axis. Color-coded cells indicate availability status:

- **Light Blue boxes: Occupied time slots of the lecture hall.**
- **Dark blue boxes: Vacant time slots of the lecture hall.**

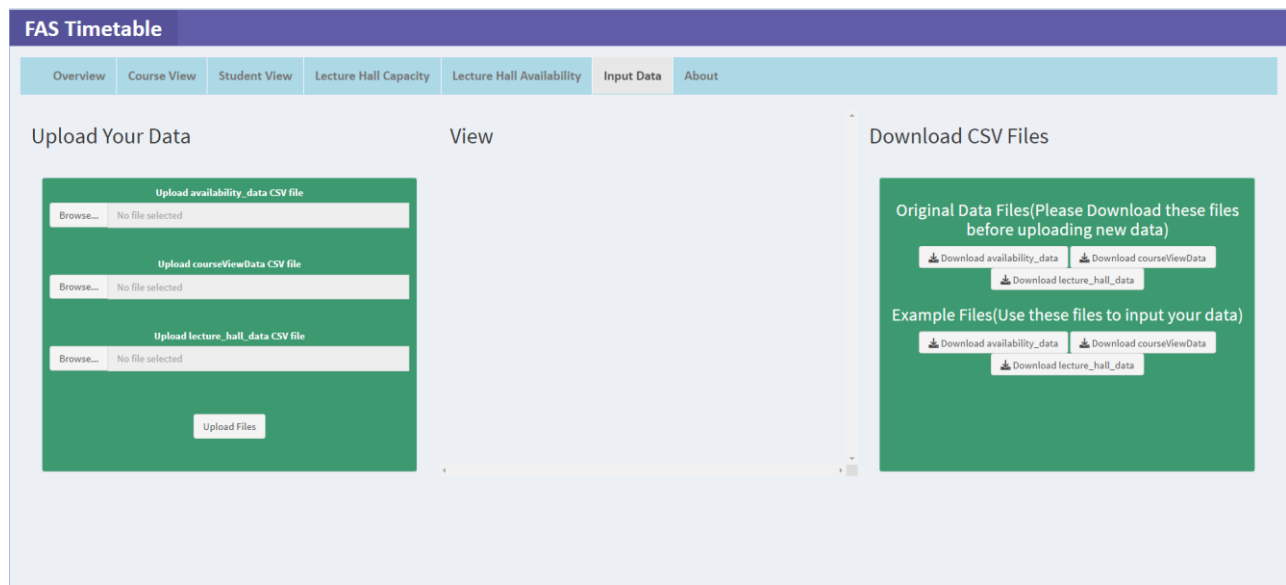
This heat map allows you to quickly identify when the lecture hall is in use and when it has available time slots.

## Lecture Count by Day Bar Plot

The panel also features a bar plot visualization that presents the number of lectures scheduled in the selected lecture hall for each day of the week. This bar plot helps you understand the distribution of lectures and identify peak lecture days for the chosen lecture hall. Also, there is a color gradient which represents how busy a given lecture hall is on a particular day. The first KPI, "Weekly Lecture Count," indicates the sum of the lecture counts shown in this bar plot.

## INPUT DATA PANEL

*This panel allows users to update the app according to new data. When uploading new data user should always follow the previous data format*



## Download CSV files.

This section can be used to download the original files which used to make the app and download example files where you can input your data.

- **Original Data Files**

The app is based on the original CSV files, and you can get an idea about the format of the data by referring to them. **Before uploading new data, it is important to download these original files because this app is very sensitive to the format of the data and sometimes the app might crash when the wrong CSV files are uploaded.**

By replacing those files in the “Data” folder using these original files you can run the app once again. **When uploading new data, it is important to follow the format of the original data set.**

- Example files

By downloading example CSV files, you can use them to input your data. **It is important not to change the column names of the example CSV files when adding new data to those CSV files.**

## Upload Your Data

This section is for uploading new data files. When uploading new data files format (column names, date formats etc.) should be same as the original CSV files. After browsing the file you need to click the “upload files” to overwrite the existing CSV files with your new data. Once existing files are overwritten successfully you will get a message and app will also auto update accordingly you can upload multiple files at once also If you go back to original state of the app to see the old data you can reload the app ( this also can consider as a drawback of the app) and if you want to go back to the original state permanently you have to upload the original files after downloading them from the “Download CSV files” section

## View Data

Once you upload your files before clicking upload files button from this part you can view format of your file before clicking upload file button which allows you to double check to see whether you’re uploading the correct file.

**FAS Timetable**

OverviewCourse ViewStudent ViewLecture Hall CapacityLecture Hall Availability**Input Data**About

**Upload Your Data**

**Upload availability\_data CSV file**

Browse...availability\_data.csv

Upload complete

**Upload courseViewData CSV file**

Browse...No file selected

**Upload lecture\_hall\_data CSV file**

Browse...No file selected

Upload Files

**View**

X	Location	Day	TimeSlot	Availability
1	A1	Monday	08:00 - 08:50	1
2	A1	Monday	08:55 - 09:45	1
3	A1	Monday	10:15 - 11:05	1
4	A1	Monday	11:10 - 12:00	1
5	A1	Monday	13:00 - 14:00	0
6	A1	Monday	14:00 - 15:00	1
7	A1	Monday	15:00 - 16:00	1

**Download CSV Files**

**Original Data Files(Please Download these files before uploading new data)**

Download availability\_data

Download courseViewData

Download lecture\_hall\_data

**Example Files(Use these files to input your data)**

Download availability\_data

Download courseViewData

Download lecture\_hall\_data