Preliminary Design

Smart Scheduling

Requested by:

Dr. Robert Yoder
Computer Science Department Head
Siena College
Department of Computer Science

Prepared by:

Empire Unlimited

Thomas Mottola
Jonathan Smith
Jason Czajkowski
Brian Maxwell
Meghan Servello
Colliln Lefeber

December 8, 2010

Smart Scheduling

Preliminary Design

Table of Contents

Review

1.1 Product Overview

Convenience is of the utmost importance in today's world. Dr. Yoder is looking for a product that can deliver this same experience in regards to his management of the Siena College Computer Science Department class schedule. Scheduling is currently done by hand and is extremely cumbersome, so our product (Smart Scheduling) seeks to apply the speed and automation of today's technology with the flexibility of an internet application. The product will aim to provide a convenient and familiar calendar-like interface that Dr. Yoder can use easily and efficiently to plan the use of the department's resources. Other users like, students and faculty. would also be able to take advantage of the Smart Scheduling software by being able to view current semester schedules to facilitate their own plan making should they need a room.

1.2 User Case Narratives

Course Coordinator/Administrator: Course Coordinators will have the ability to log into the system via a unique username and password. System is defined as our (Empire Unlimited) application called Smart Scheduling. Once logged in, the Course Coordinator will have the ability to create new or edit existing schedules. The Course Coordinator will be able to assign classrooms, courses, and faculty in the schedule. The Course Coordinator will have access to a database of past schedules which may be viewed or used as a template for a new schedule. The Course Coordinator will have the ability to view reports on classroom use and Faculty schedules.

The Course Coordinator is responsible for creating and managing schedules, and will submit them to the School Dean and all Faculty members for approval and viewing, respectively.

Faculty:

Faculty will have access to the system via a unique username and password. Faculty can view all schedules submitted by the Course Coordinator, as well as be able to view classroom and Faculty reports. Faculty will have the ability to add office hours and other meetings to their own schedule.

General User:

General Users will have access to the system without any authorization. General users will be able to view faculty and classroom schedule reports. A general user will not have any rights to modify or add to a schedule.
In addition to being able to view faculty and classroom schedule reports, schedules will be printed out, and posted outside of classrooms and faculty offices. This will enable everyone, mostly general users, to see at a quick glance which classrooms are being used by which teacher.

1.3 Functional Requirements Inventory

Smart Scheduling will be able to run on all popular browsers including but not limited to: Internet Explorer, Mozilla Firefox, as well as Google Chrome.

The following is the functional requirements for each user. The requirements are grouped by the user; there are 3 users for Smart Scheduling.

Course Coordinator

- Will be able to find common time slots to schedule departmental meetings or new classes.
- Will be able to modify the schedule.
    - Will be able to delete previous schedules.
    - Will be able to delete classes
    - Will be able to modify classes.
- Will be able to add new classes.
- Will be able to securely log into the system using a registered username and password.
- Will be able to view the current schedule.
    - Will be able to filter the schedule by professor(s).
    - Will be able to filter the schedule by classroom(s).
- Will be able to create a faculty account, where faculty will be able to access the system.
- Will be able to view and print room reports.

Faculty

- Will be able to securely log into the system using a registered username and password.
- Will be able to view the current schedule.
    - Will be able to filter the schedule by professor(s).
    - Will be able to filter the schedule by classroom(s).
- Will be able to view and print room reports.
- Will be able to add office hours or other meeting, where they will be available in order to meet with students or fellow teachers.

<u>General User</u>

- Will be able to view and print room reports.
- Will be able to view the current schedule.
    - Will be able to filter the schedule by professor(s).
    - Will be able to filter the schedule by classroom(s).

This list is subject to change as more information is gathered about the project.

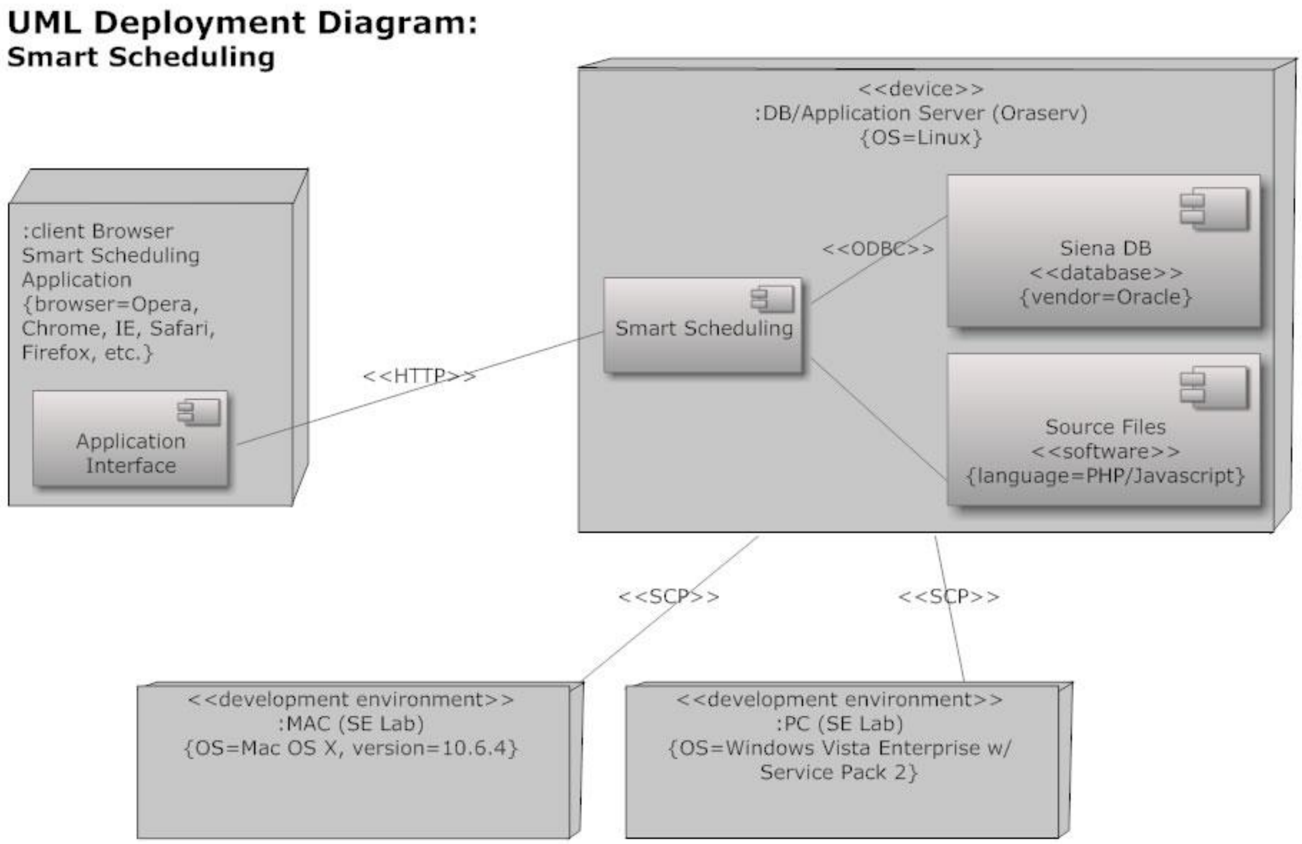
1.4 Non-Functional Requirements Inventory

The non-functional requirement inventory is a list of non-functional system requirements. This list is composed of requirements that specify how the system *should* be. This list is subject to change as more information is gathered about the project.

- The system will be easily maintained.
- The system will be stable.
- The system will be viewable on multiple browsers.
- The system will be efficient.
- The system will be user friendly and easy to use.

1.5 UML Deployment Diagram

Deployment Diagrams are a Unified Modeling Language (UML) based diagram used to show devices and execution environments for a system. It represents the physical layout of the System.



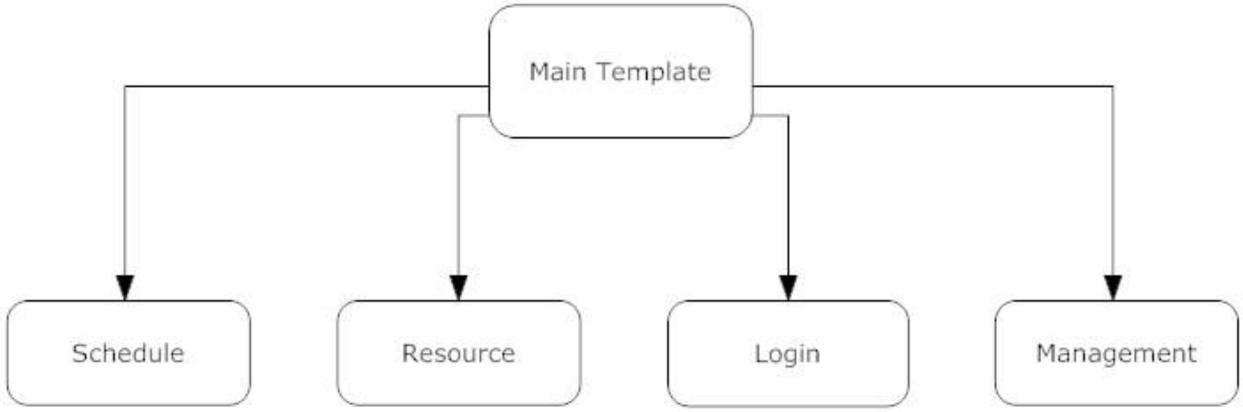
1.6 Framework Tree

For Smart Scheduling we anticipate using a web framework as opposed to *pure* server side (PHP) code. A framework operates on a few conventions that allow our code to be reusable and well organized.

Most modern frameworks use a Model View Controller (MVC) philosophy to organize code into logical groups which makes it easier for the programmer to find, write, reuse, and manage their code. Models interact with the database with queries, views contain page layouts and templates while the controller puts the two together into a cohesive page by calling the model and passing the data down to the view. Therefore a traditional html file web map would not be sufficient to describe such behavior, because the actual files will be organized differently and in a way we cannot predict.

A more useful map of our project would be focused on the views because the user directly interacts with them. As mentioned before views serve as templates for different sections of the Smart Scheduling system. The following tree should help diagram how the site will be laid out by showing views in a tree-like view.

In terms of diagramming the system's functionality along with this tree view like a web map, our functional requirements inventory already parallel the views.

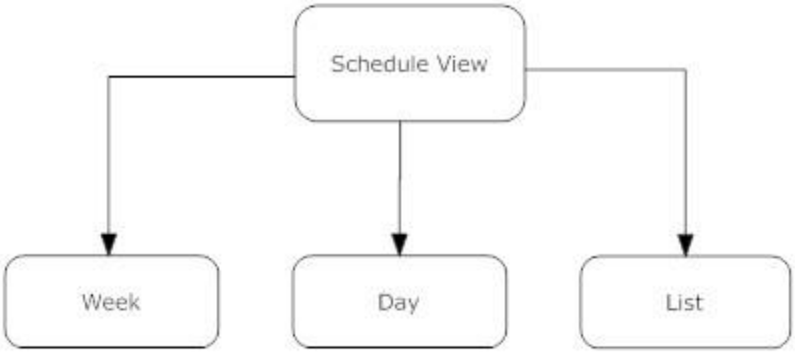


The above image shows the highest level of our view structure. The user will access pages through the main website template that will retain a common header (among other elements) while altering the main body of the page. We anticipate there should be multiple ways to view:

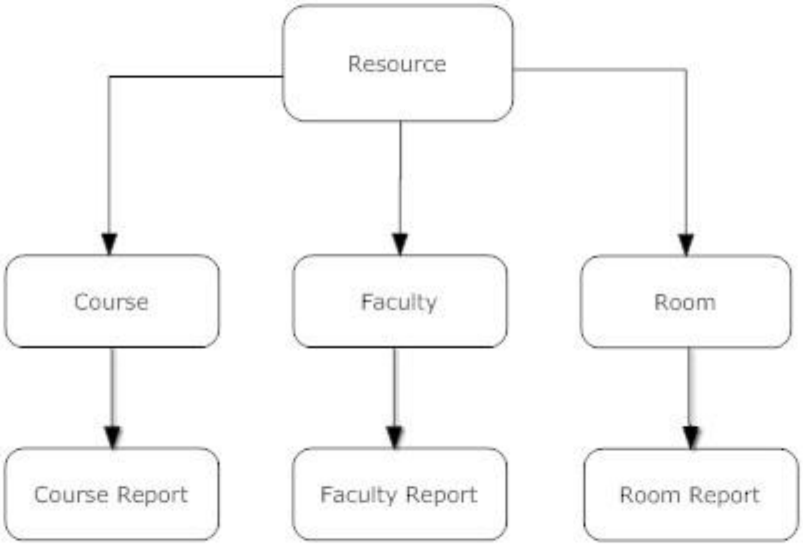
- The Schedule
  - Viewed by week, day, or list format
- Resources
  - Viewing of an individual faculty member, course, or room

- Login
    - Logging in
- Management
    - Coordinators view of updating each resource

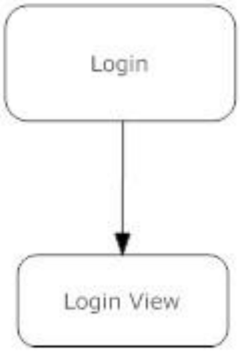
Schedule Section



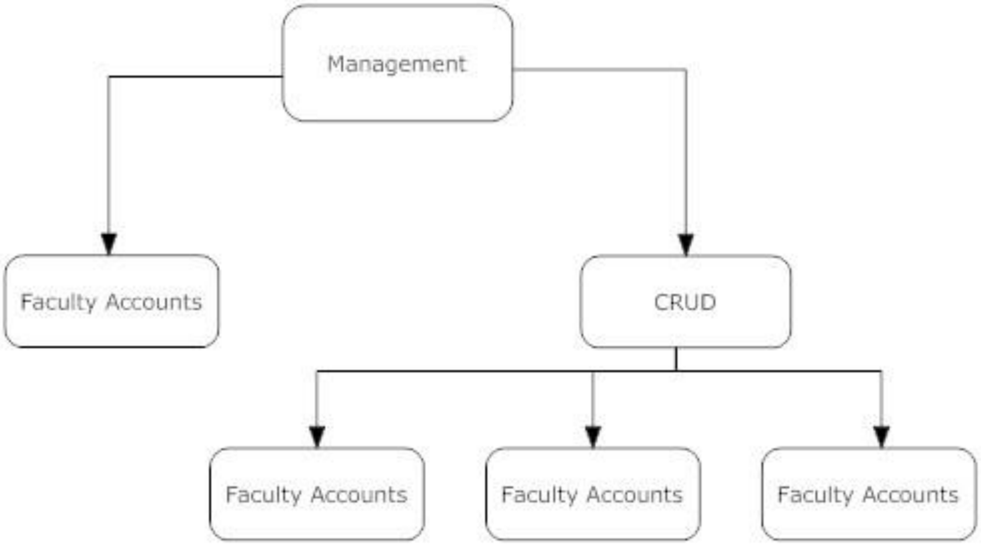
Resource Section



Login Section



Management View

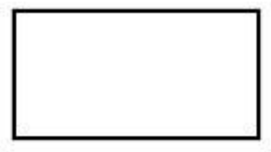


Preliminary Design

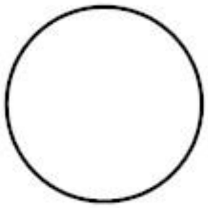
2.1 Data Flow Diagrams

The purpose of Data Flow Diagrams is to show the “flow” and transformation of data through the system. These diagrams are used as a visualization tool to help the audience get a better idea of what exactly is going on in the system. The first image shown below will be a legend describing what each of the different items in the diagrams are and what they represent. A Context Diagram is shown next, which is the general overview of each of the different agents interacting with the system. The Level 0 Diagram shows some more details about which processes each of the agents will be interacting with. Arrows are drawn to show the flow of data between the agents and processes. Following the Level 0 Diagram are two Level 1 Diagrams, each for one of the processes of the system. Each Level 1 Diagram shows that individual process in greater detail and contains labeled arrows to indicate what information is flowing to and from the processes and agents. Following the Level 0 Diagram are Level 1 and Level 2 Diagrams. The purpose of these Diagrams is to further break down each of the processes that are involved with the system. The further down the level is the more detailed the diagram is.

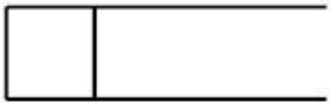
2.1.1 Data Flow Diagram Legend



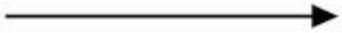
Entities/Sources/Sinks of the system which represents the users. Data will flow between these entities.



Processes of the system which represents the functions. Data will flow from and to these processes.



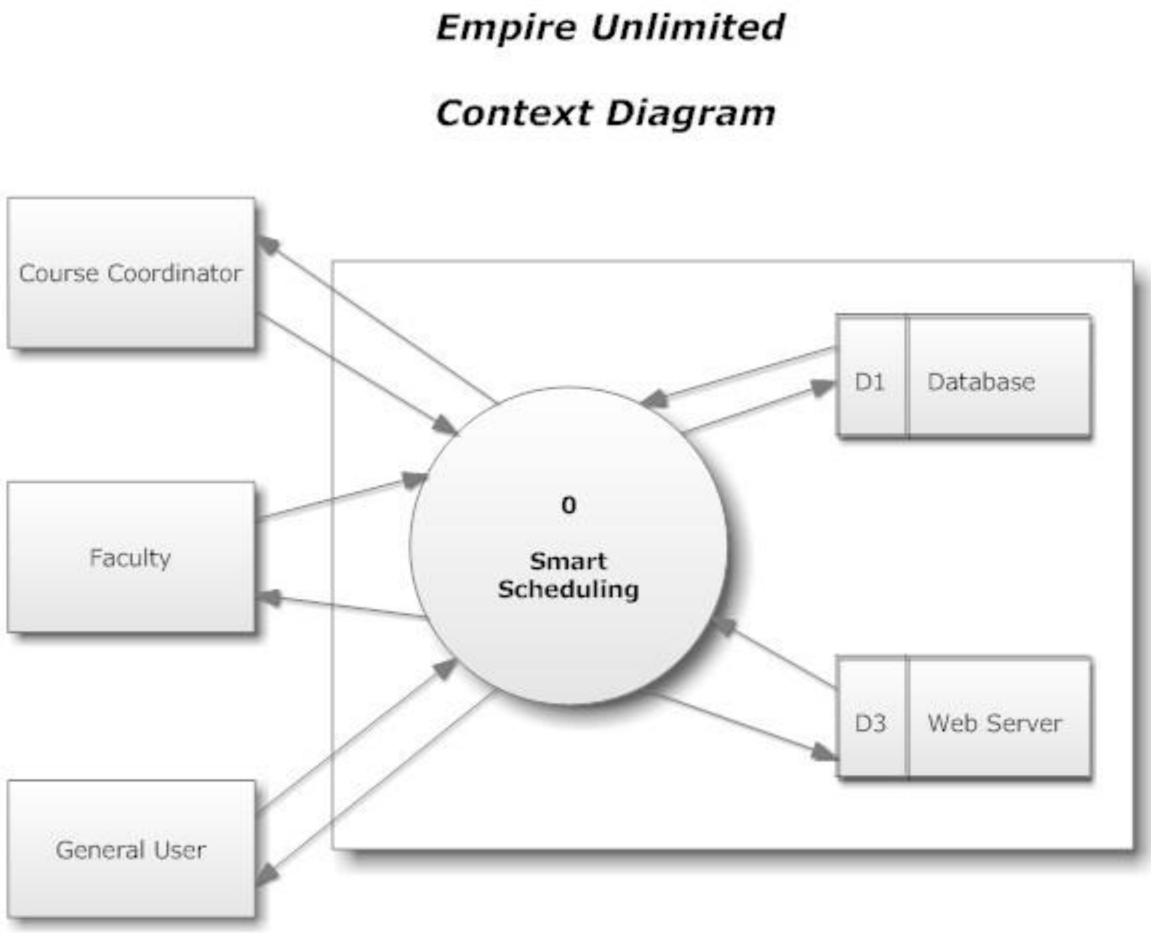
Stores of the system which represent what stores the data. Data will flow into, be saved and be pulled from these data stores.



The Flows of the system which represent the chuck or packets of information going from one component to another.

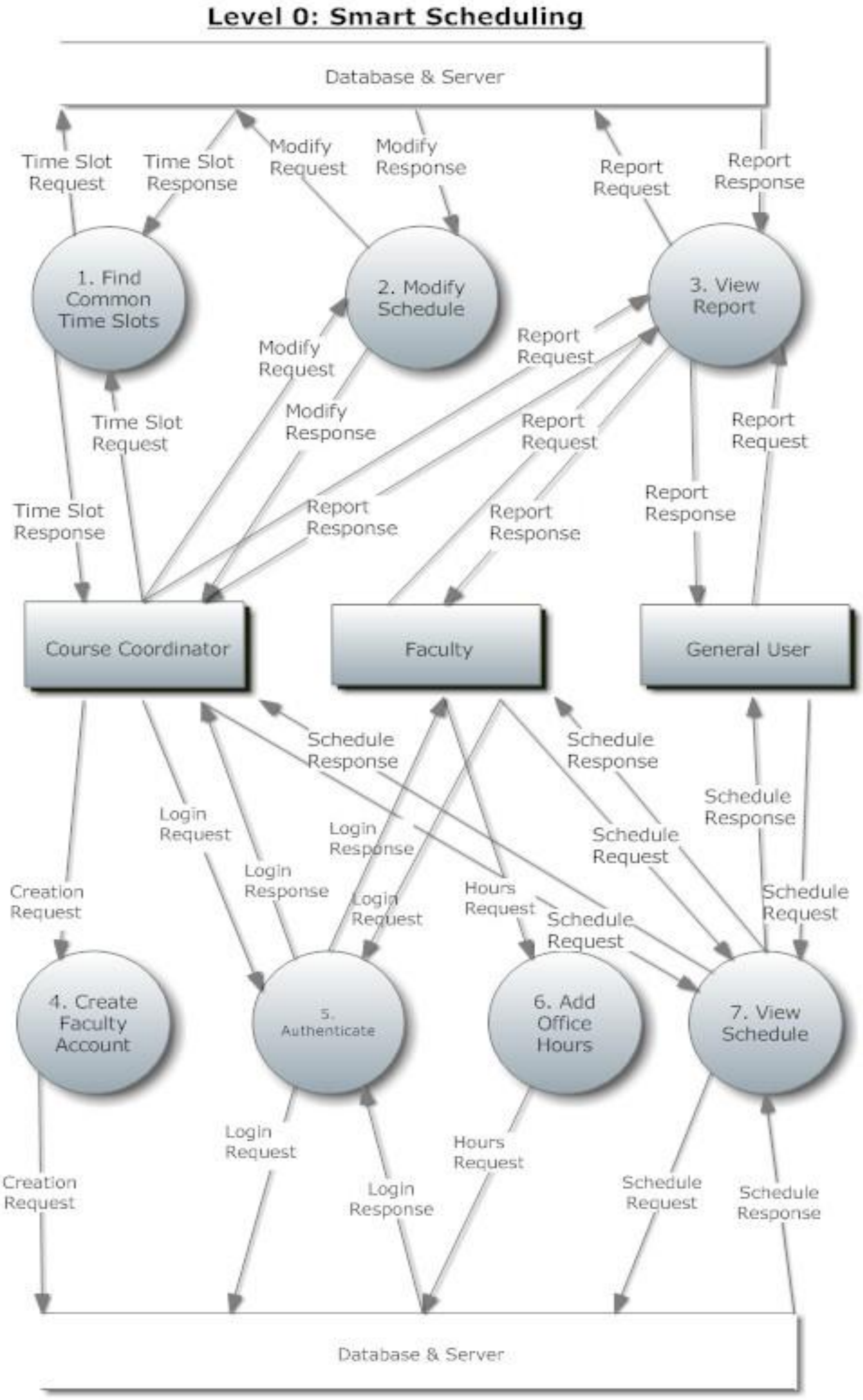
This is a legend for the Data Flow Diagrams. This legend explains all objects used in the diagram and what they represent.

2.1.2 Context Diagram

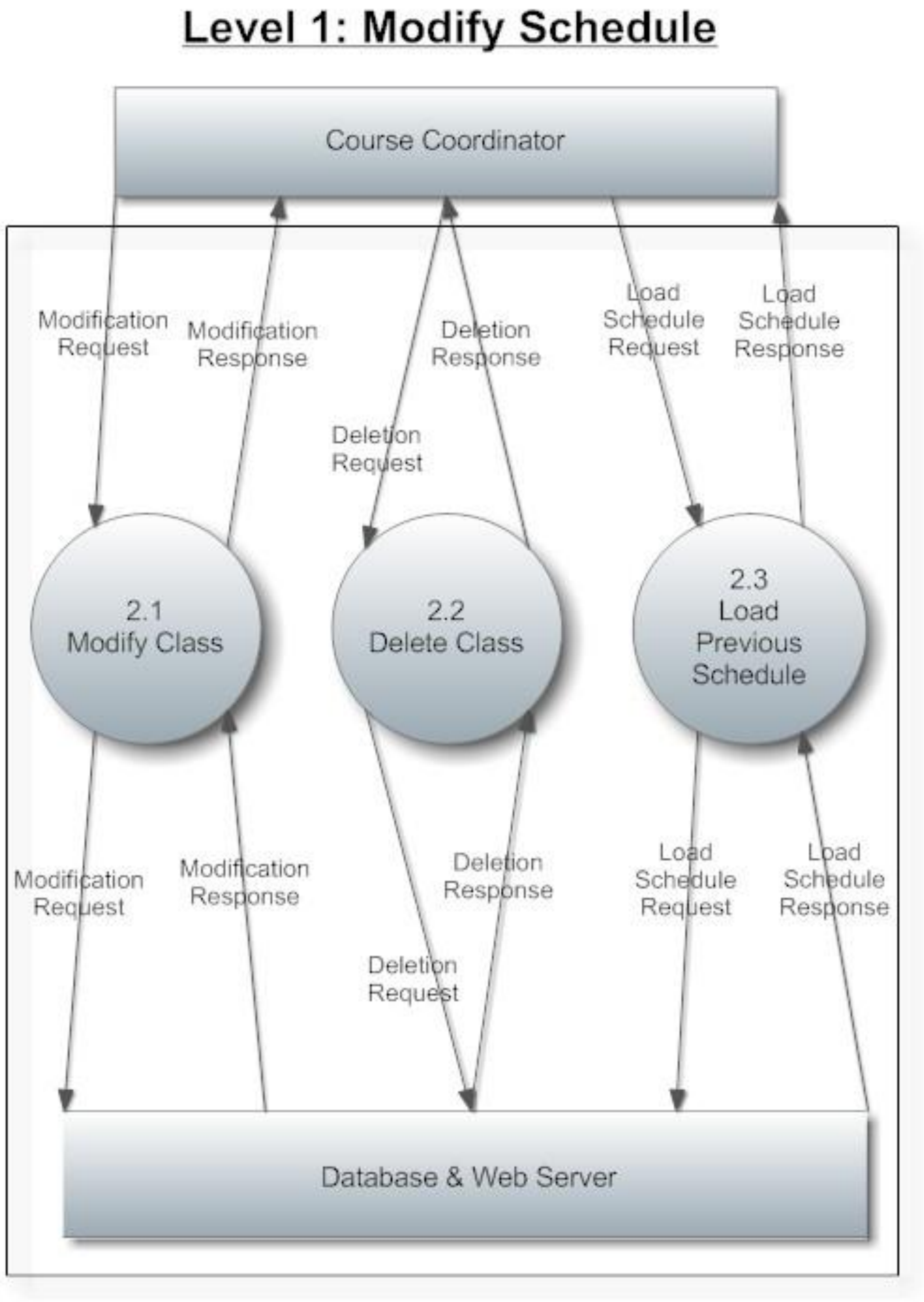


This diagram depicts a broad representation of the entities of the system and their interaction with the system.

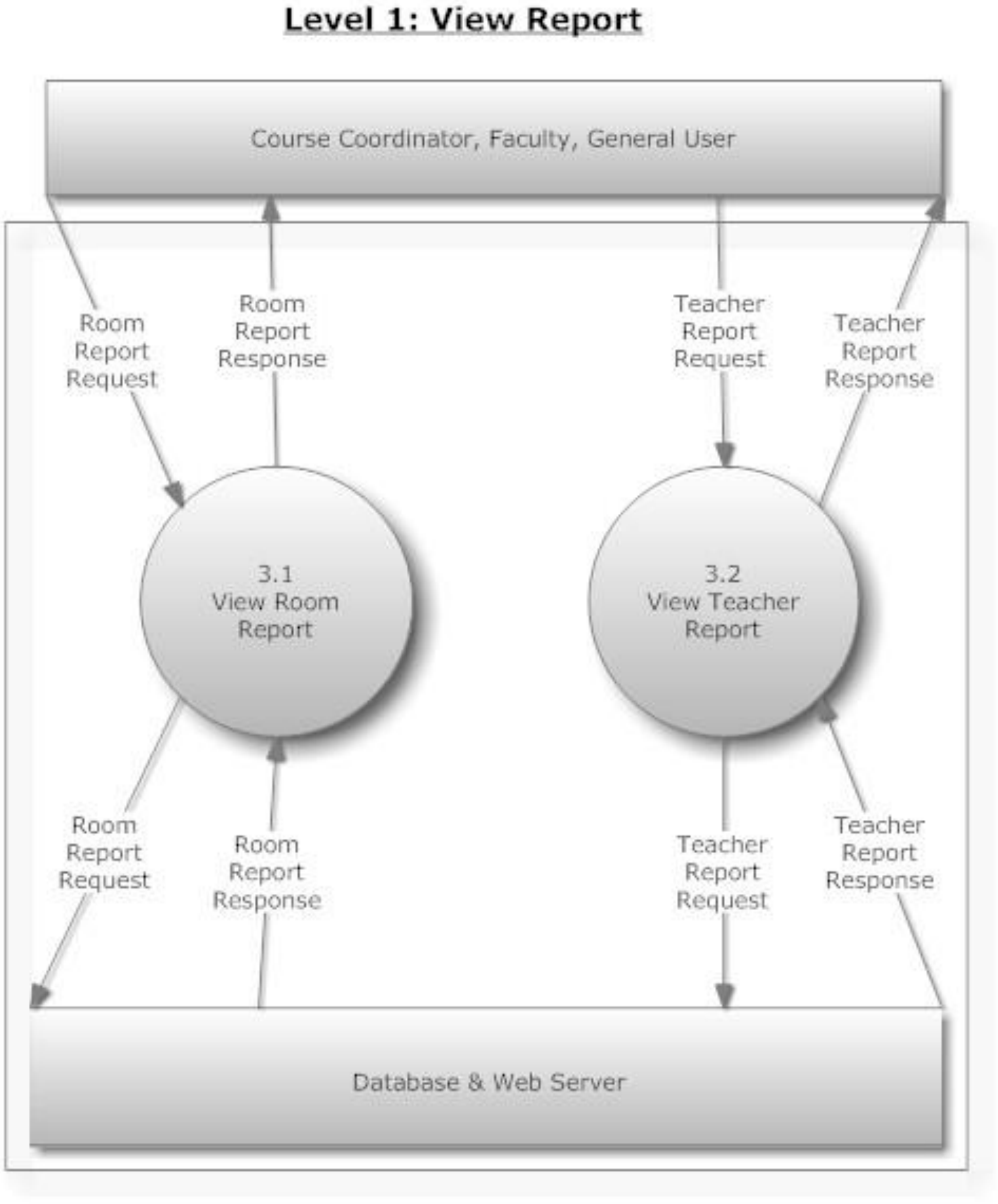
2.1.3 Level 0 Diagram



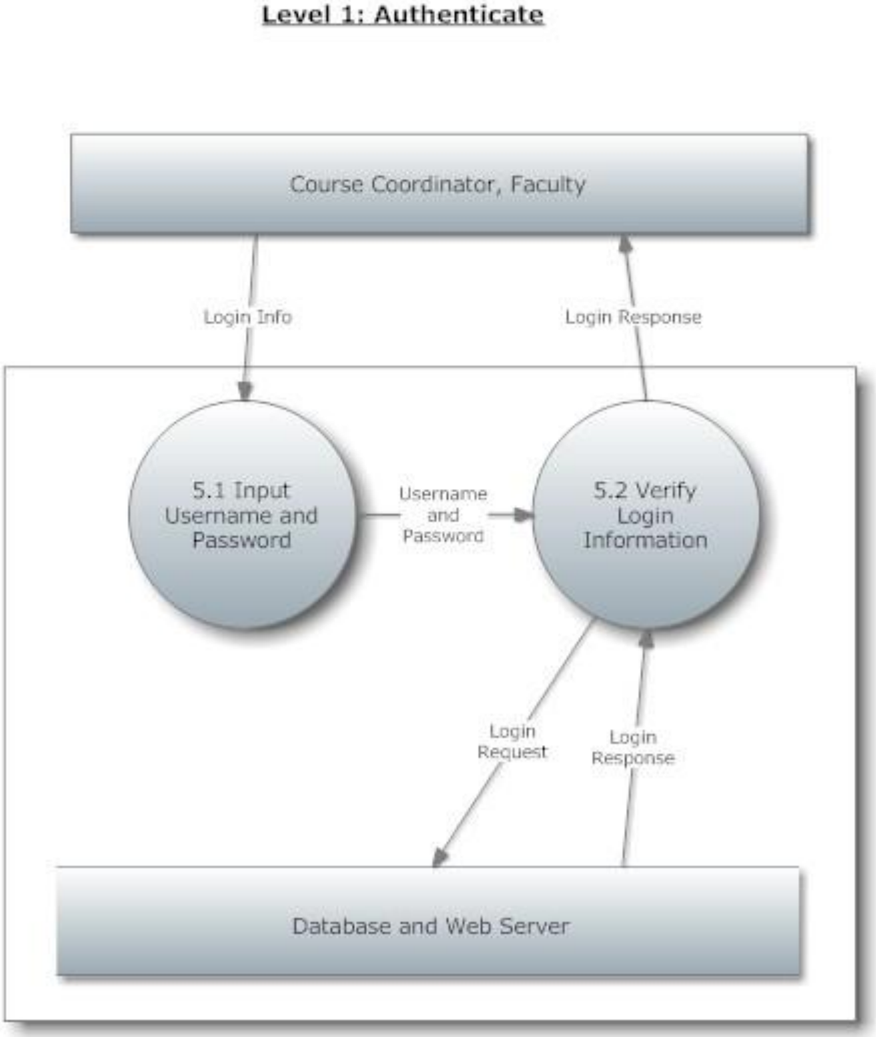
2.1.4 Level 1 Diagram: Modify Schedule



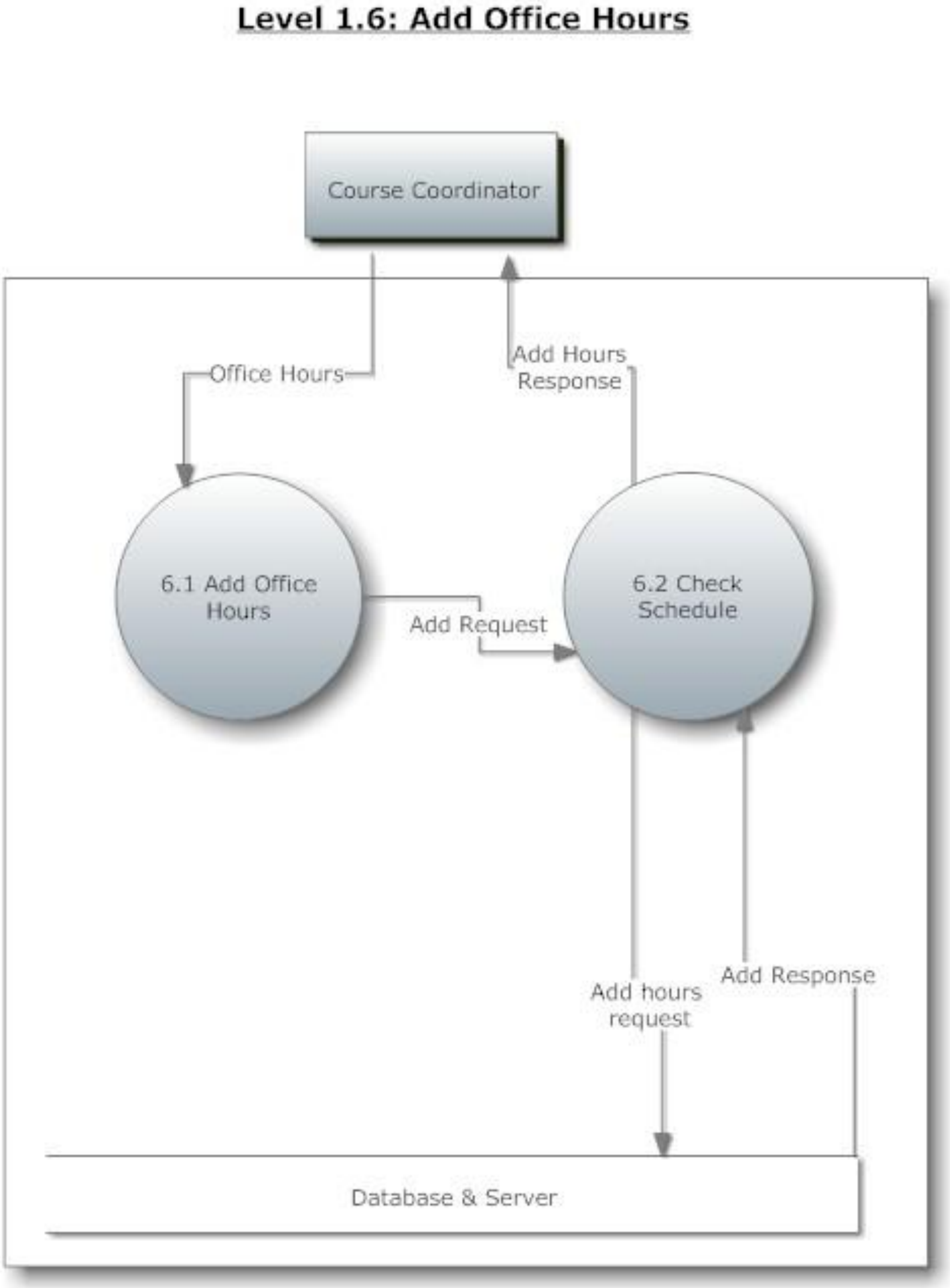
2.1.5 Level 1 Diagram: View Report



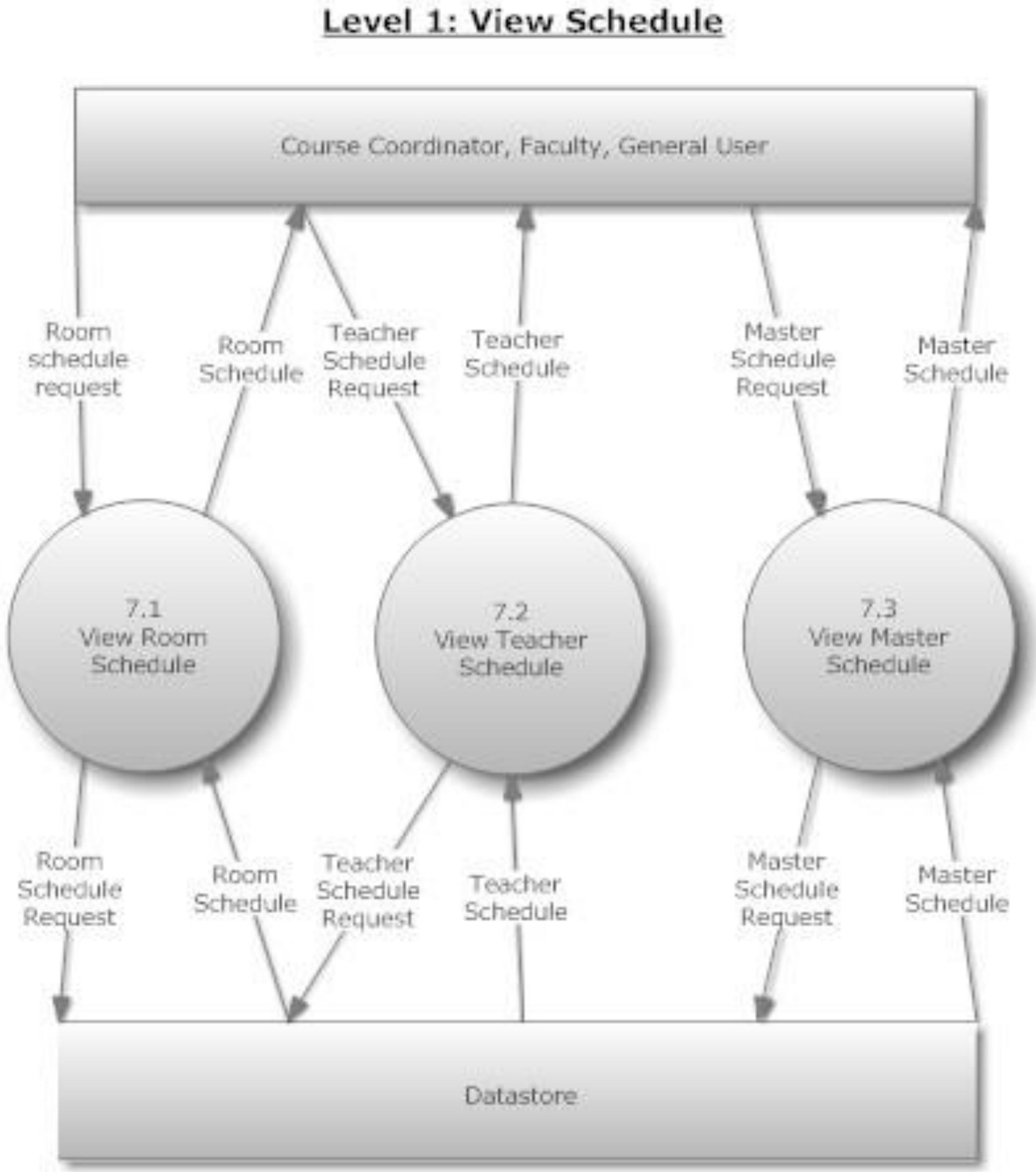
2.1.6 Level 1 Diagram: Authenticate



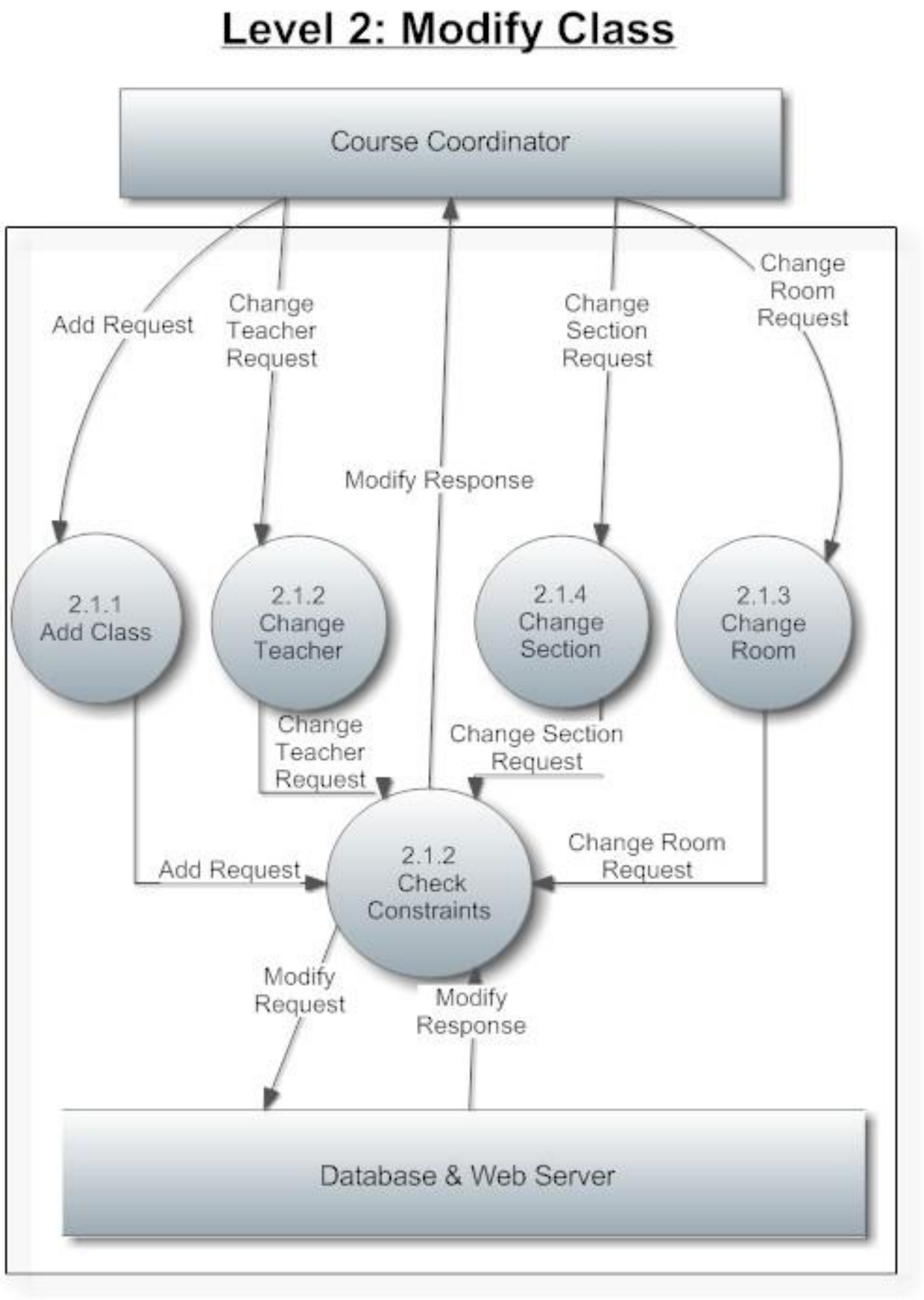
2.1.7 Level 1 Diagram: Add Office Hours



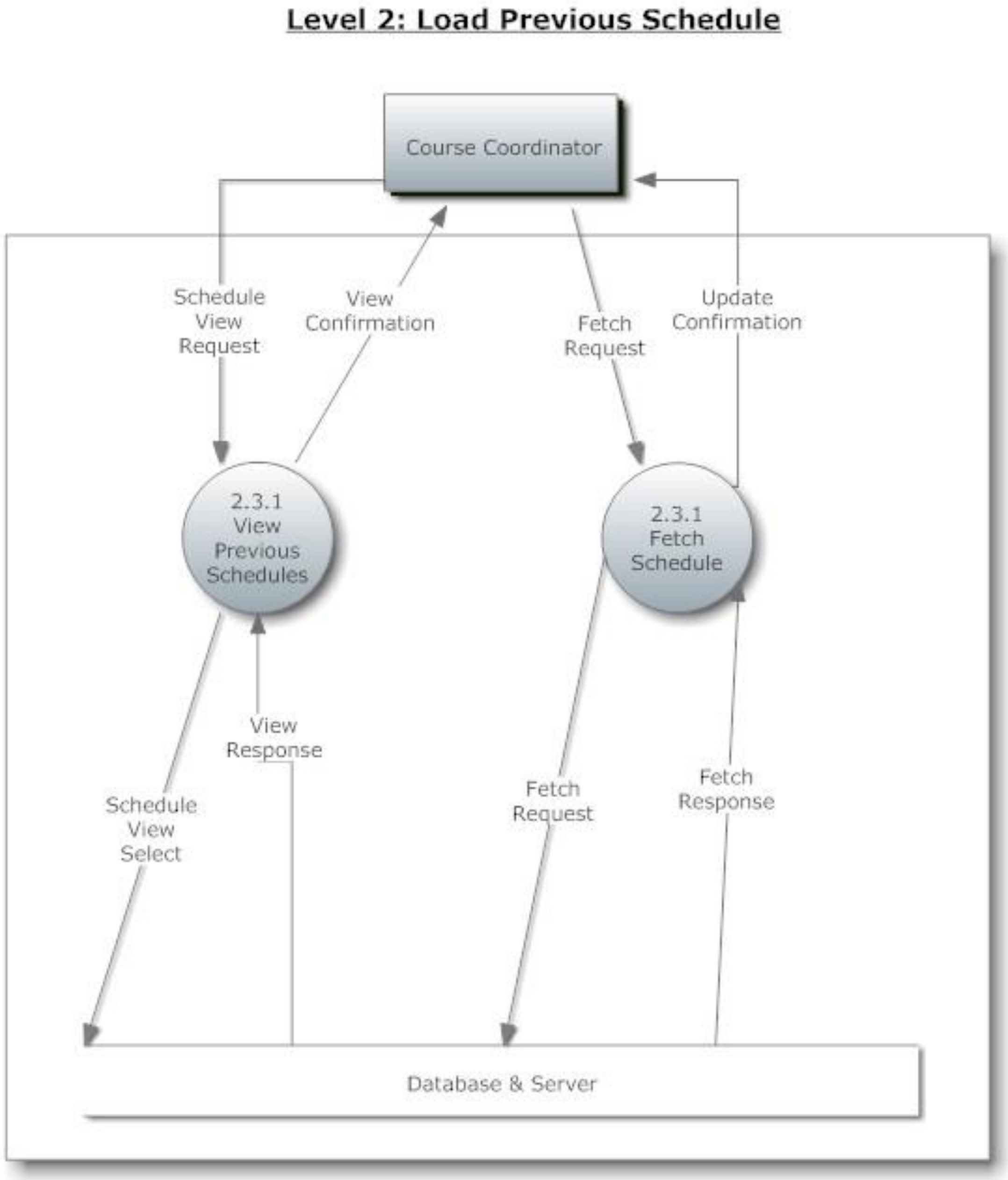
2.1.8 Level 1 Diagram: View Schedule



2.1.9 Level 2 Diagram: Modify Class



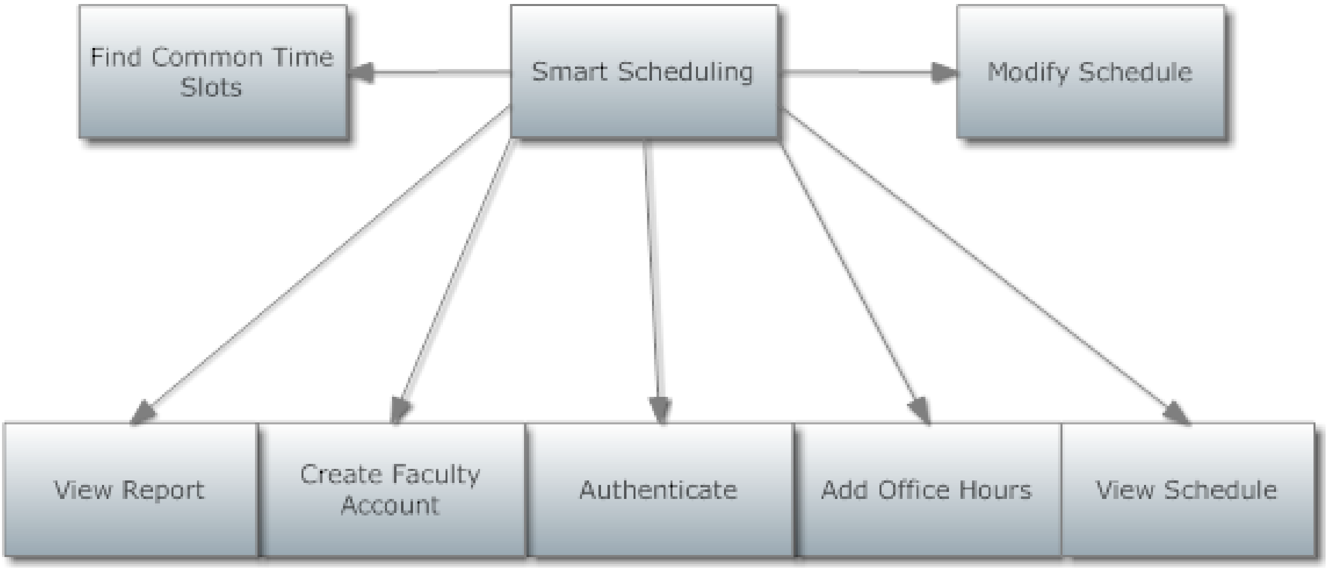
2.1.10 Level 2 Diagram: Load Previous Schedule



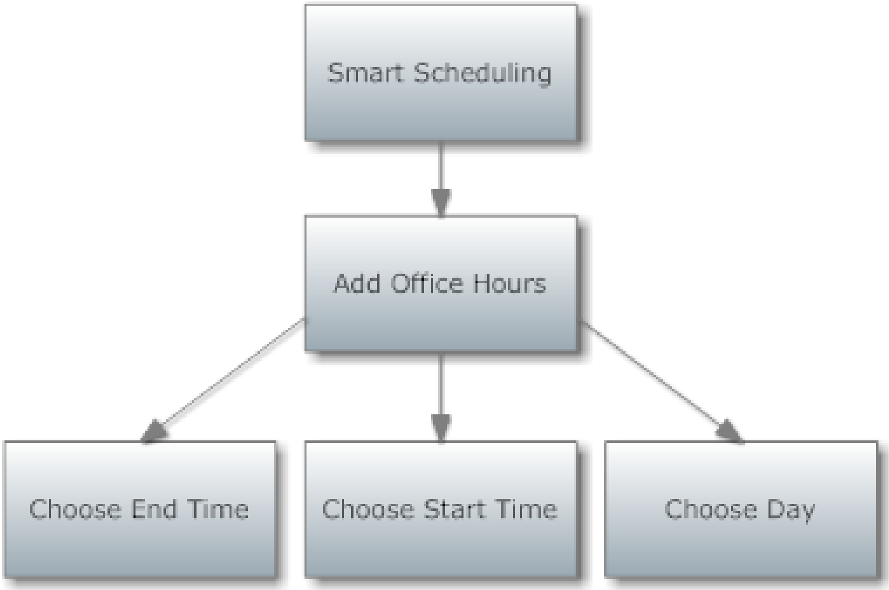
2.2 Structure Diagrams

A Structure Diagram in software engineering is a diagram, which shows the breakdown of the configuration system to the lowest manageable levels. It is used to show the hierarchical arrangement of the modules in a structured program. Each rectangular box represents a module. The names of the modules are written inside the box, and arrows are drawn between modules to show relationships.

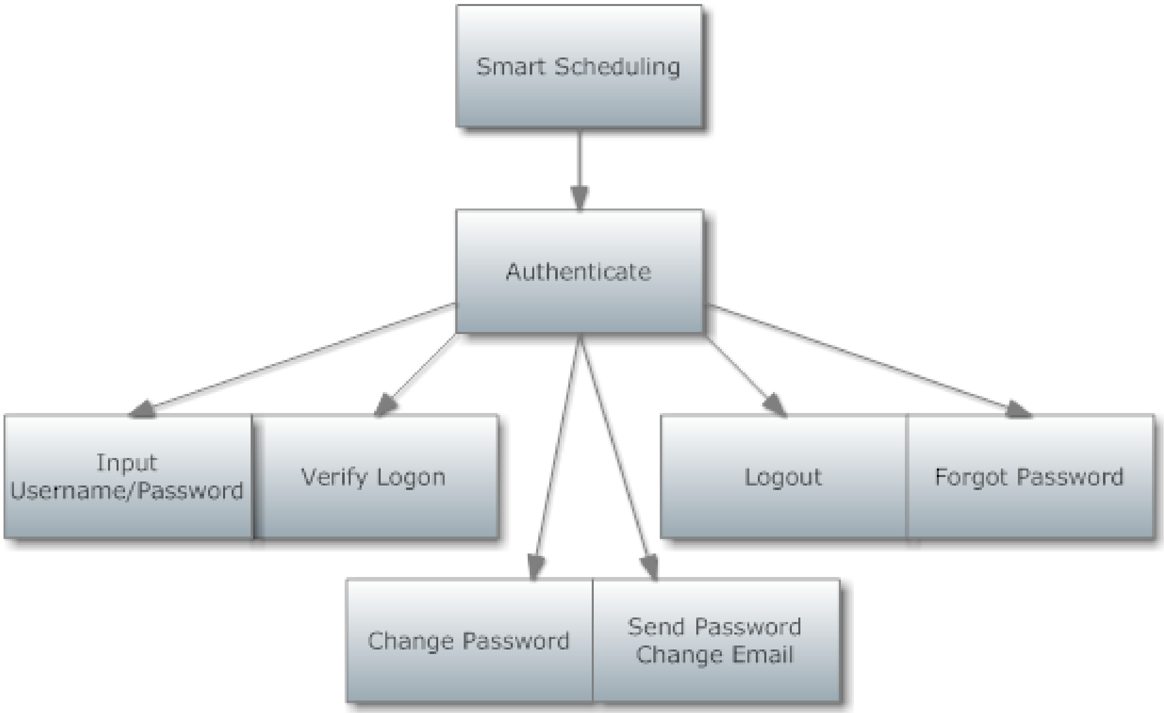
2.2.1 Structure Diagram



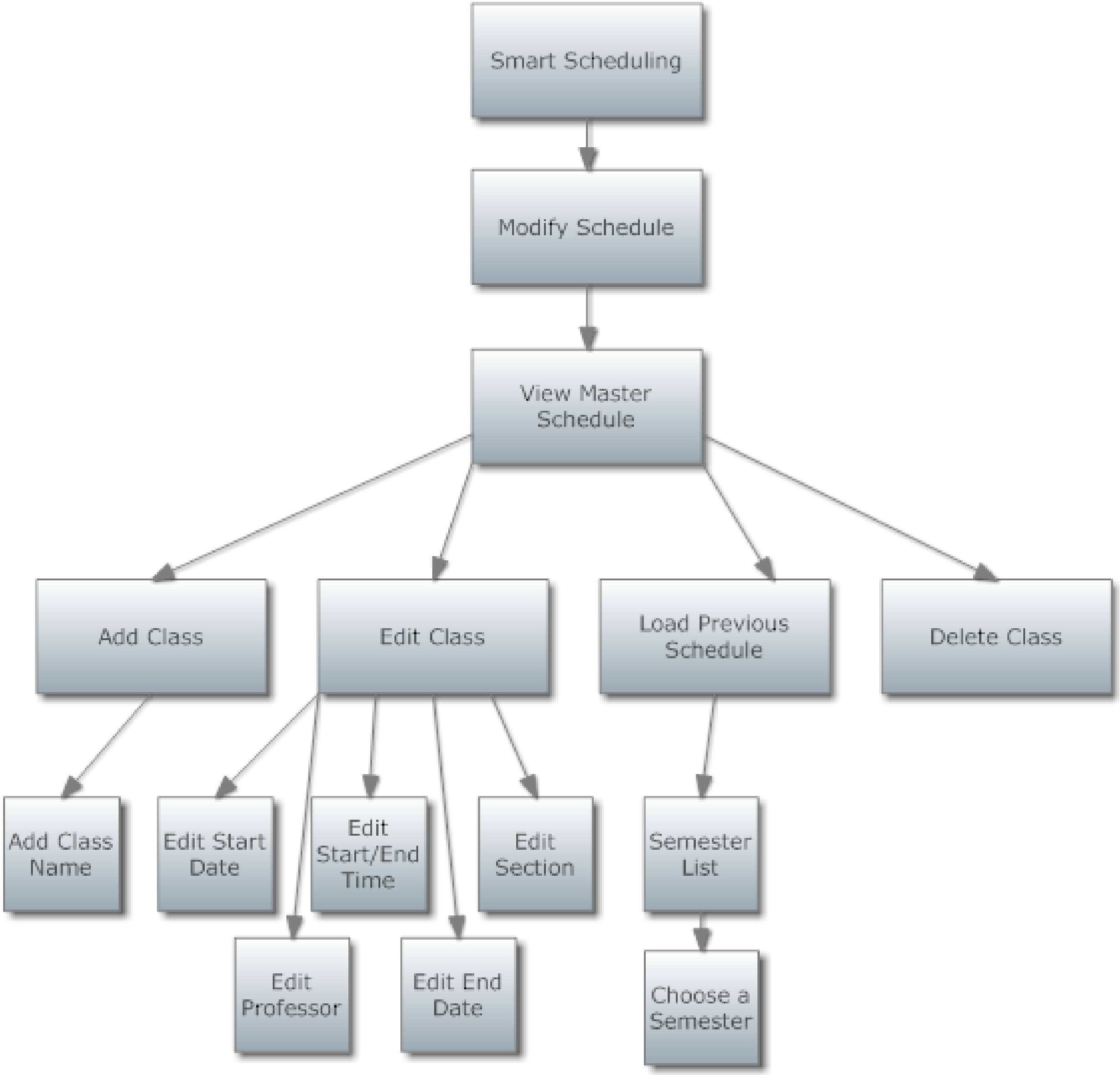
2.2.2 Structure Diagram: Add Office Hours



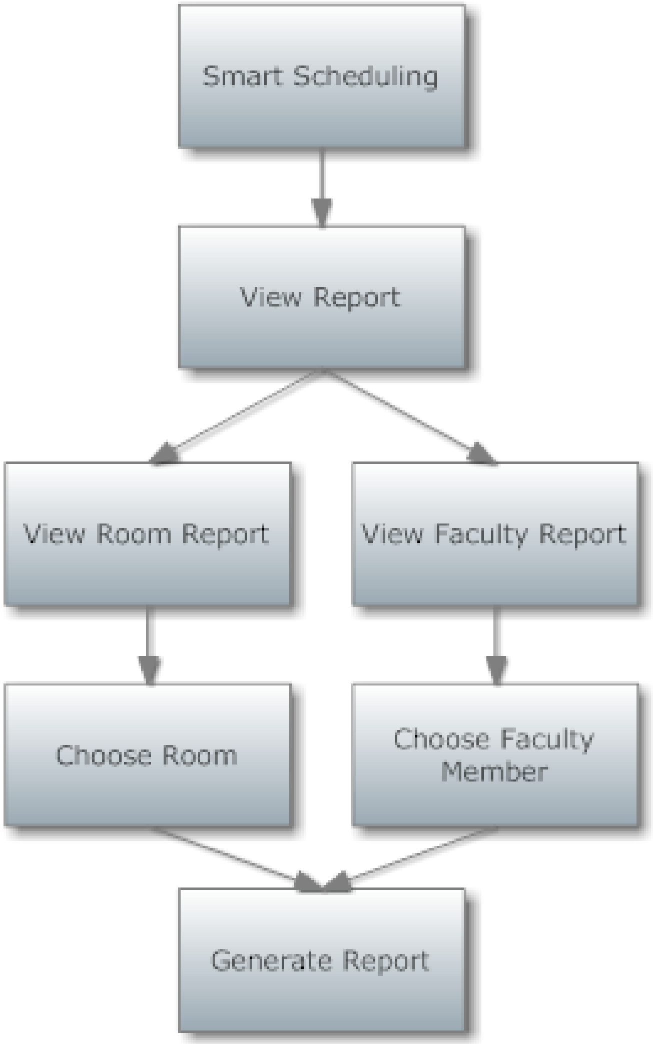
2.2.3 Structure Diagram: Authenticate



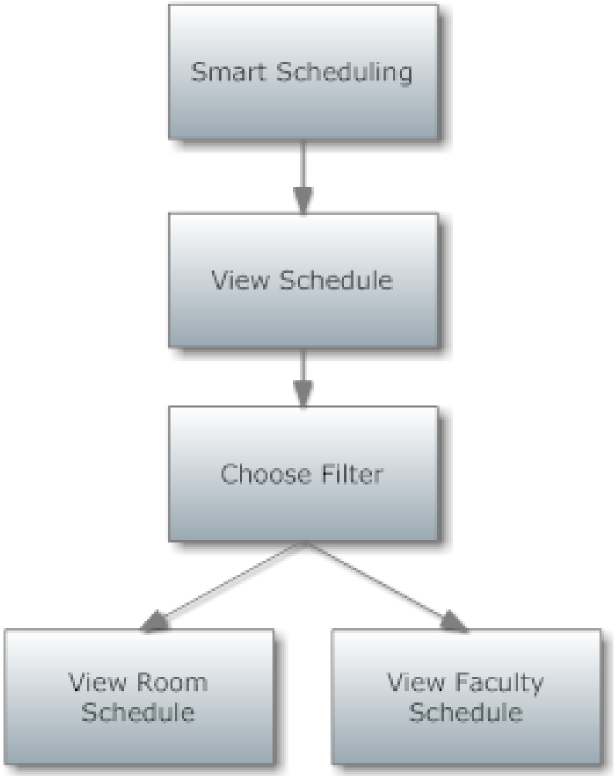
2.2.4 Structure Diagram: Modify Schedule



2.2.5 Structure Diagram: View Report



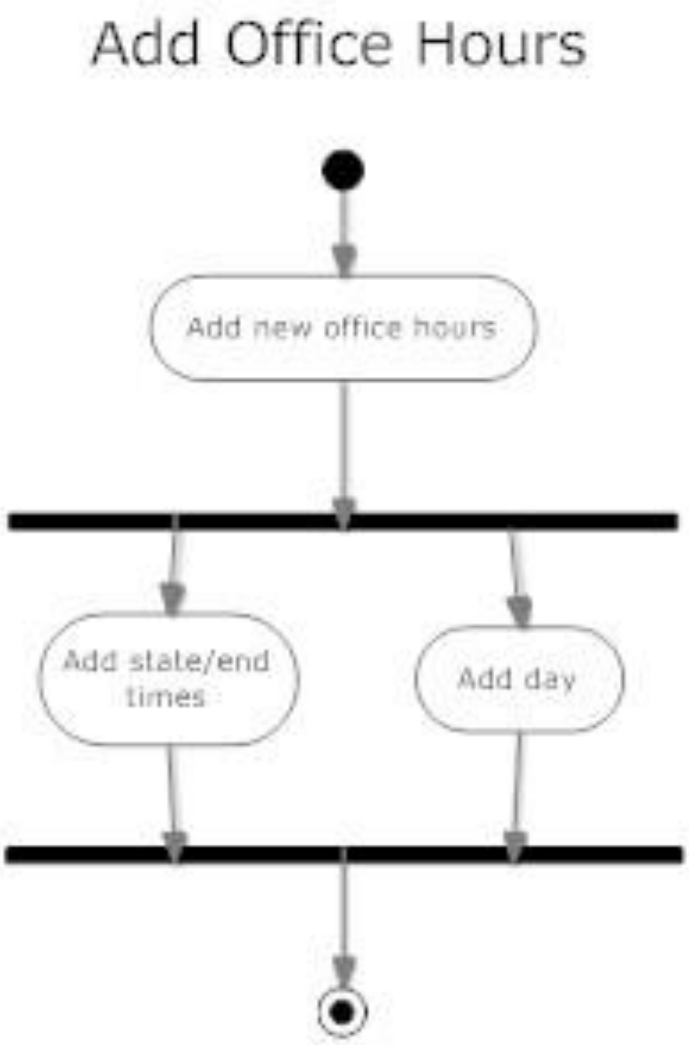
2.2.6 Structure Diagram: View Schedule



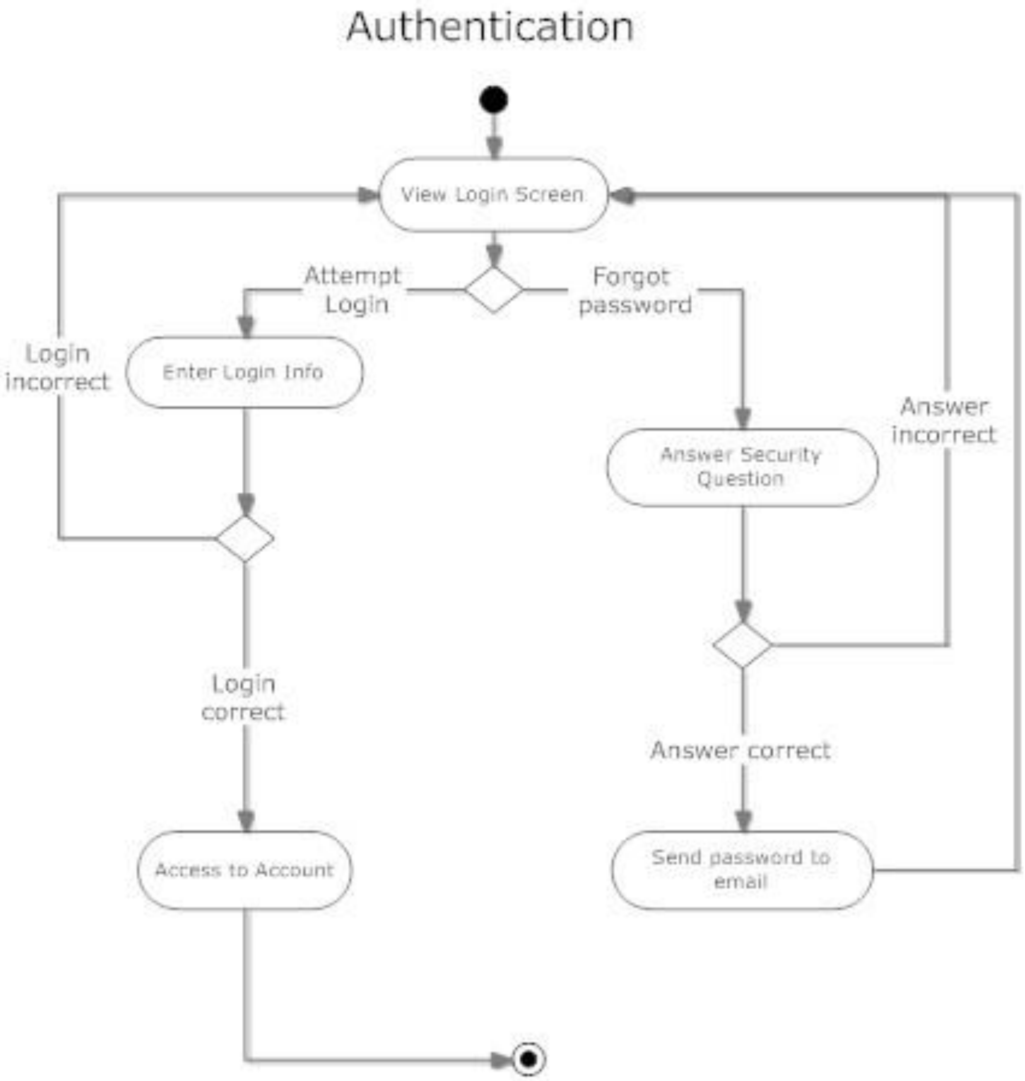
2.3 UML Activity Diagrams

Activity Diagrams are a UML (Unified Modeling Language) specified diagram which shows workflows of stepwise activities and actions, with support for choice, iteration, and concurrency. It outlines the process that Actors (both human and non-human) go through while interacting with the System to accomplish a specific task.

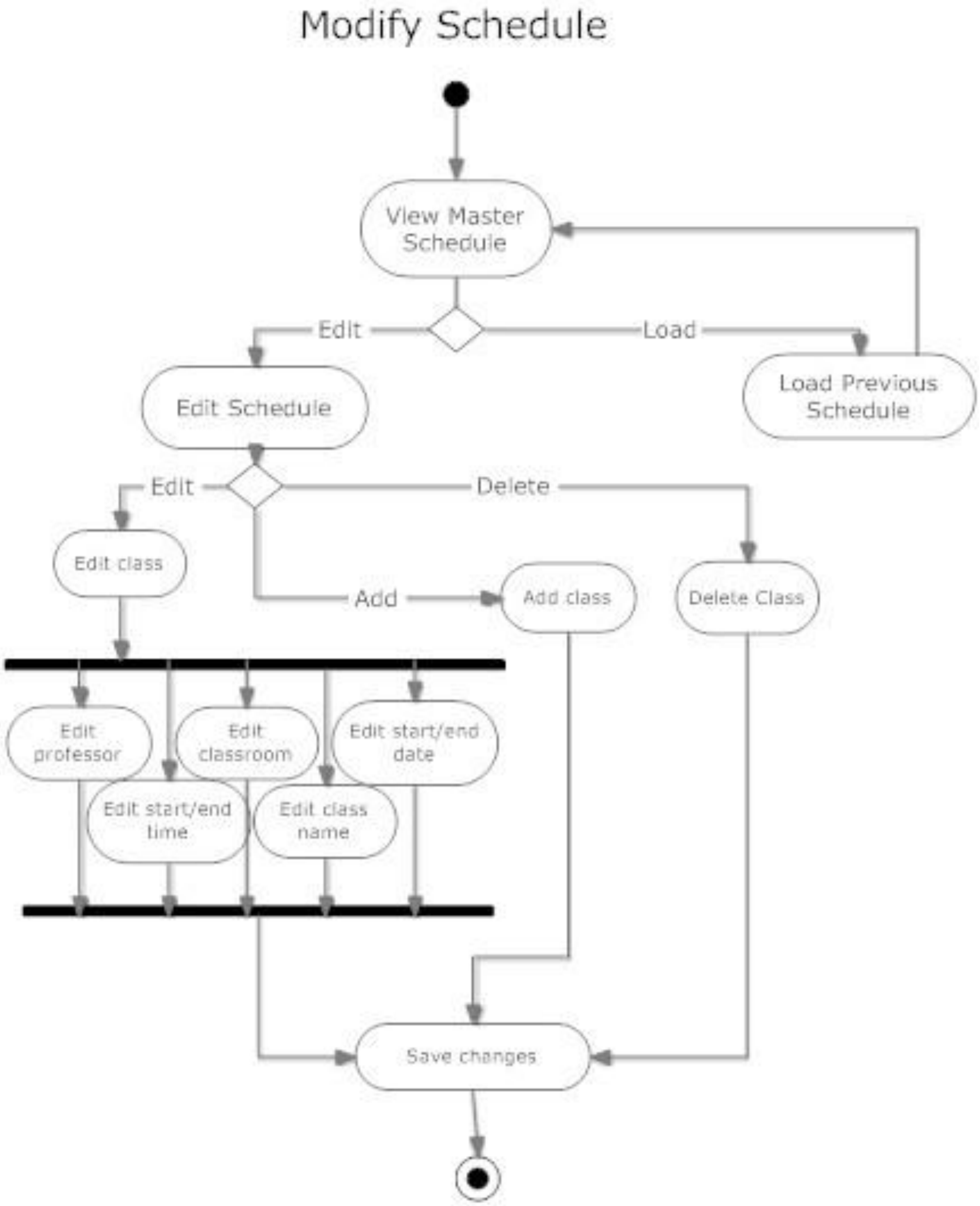
2.3.1 Activity Diagram: Add Office Hours



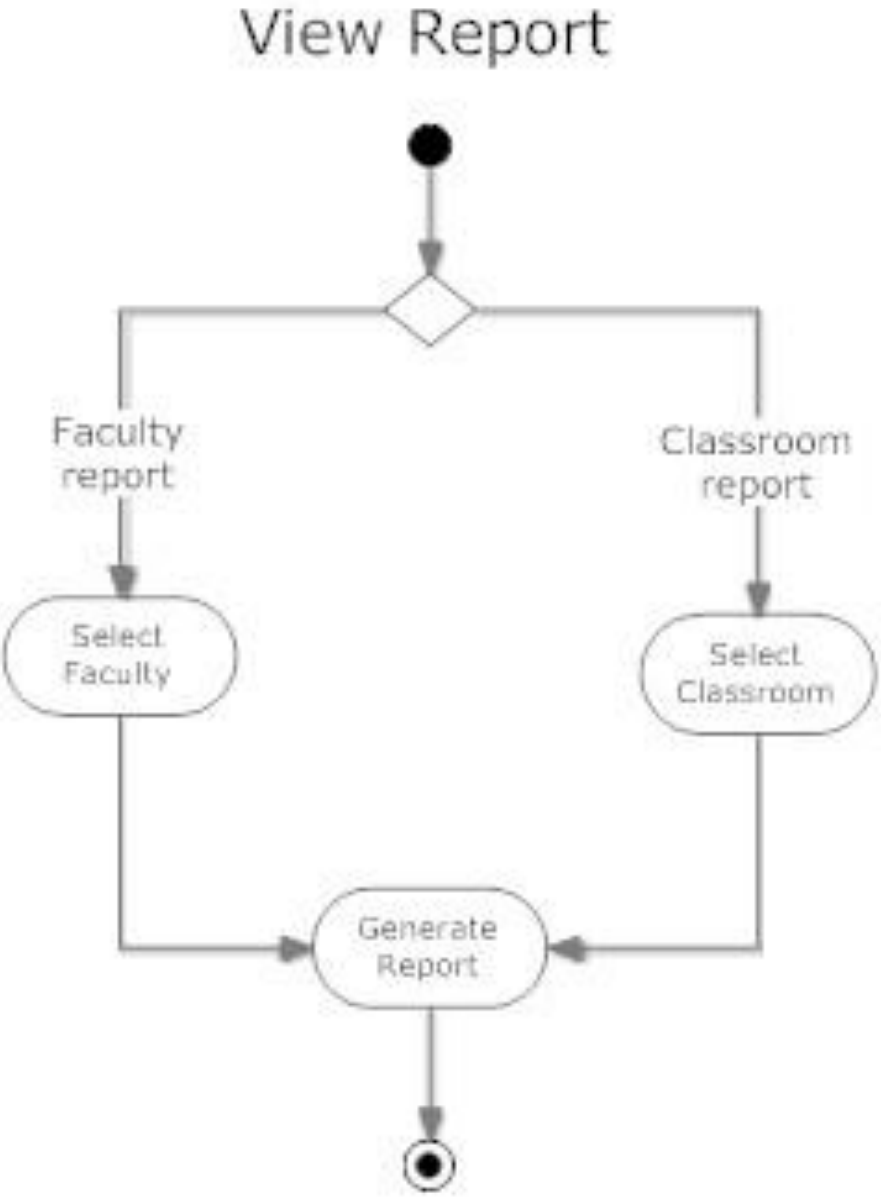
2.3.2 Activity Diagram: Authentication



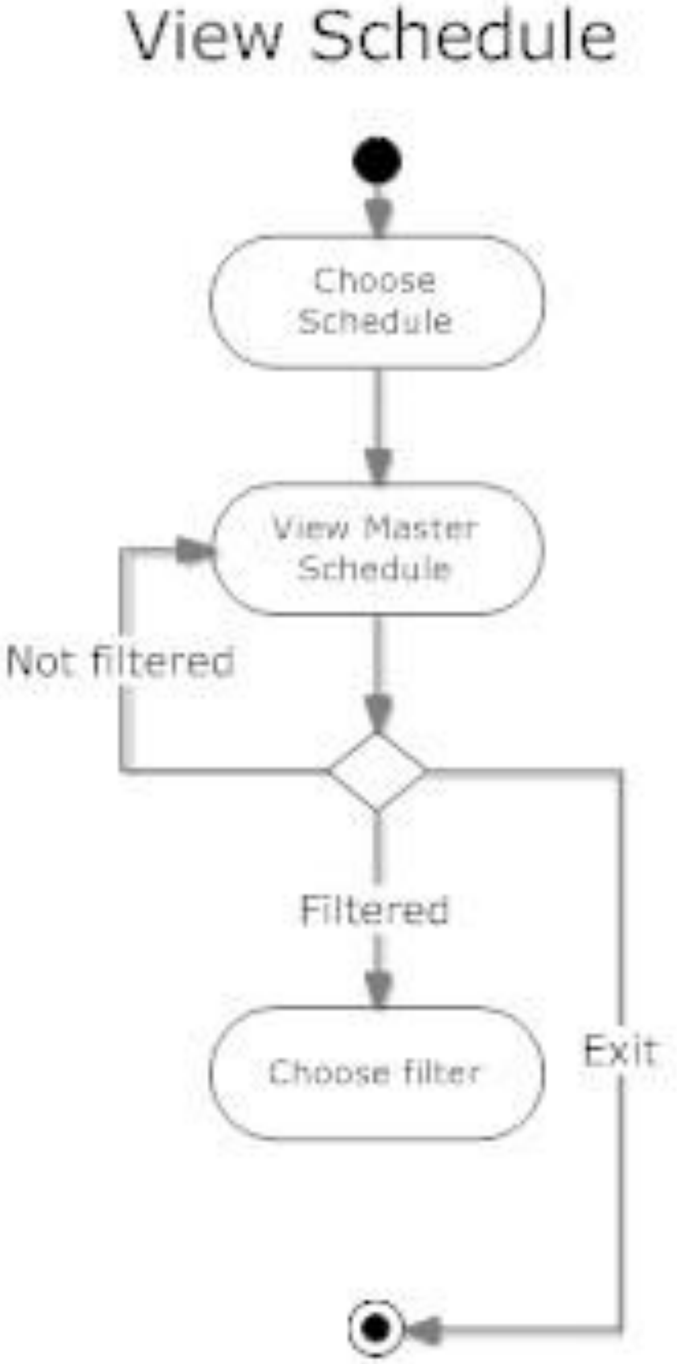
2.3.3 Activity Diagram: Modify Schedule



2.3.4 Activity Diagram: View Report



2.3.5 Activity Diagram: View Schedule



2.4 Logical Data Dictionary

Definition of a Data Dictionary: a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format." - IBM Dictionary of Computing.

KEY:

Data Name: The name of the data entity being stored, whether it be in a database or not.

Applicable To: The screens that this data entity will be used for.

Data Type: The type of data for a data entity

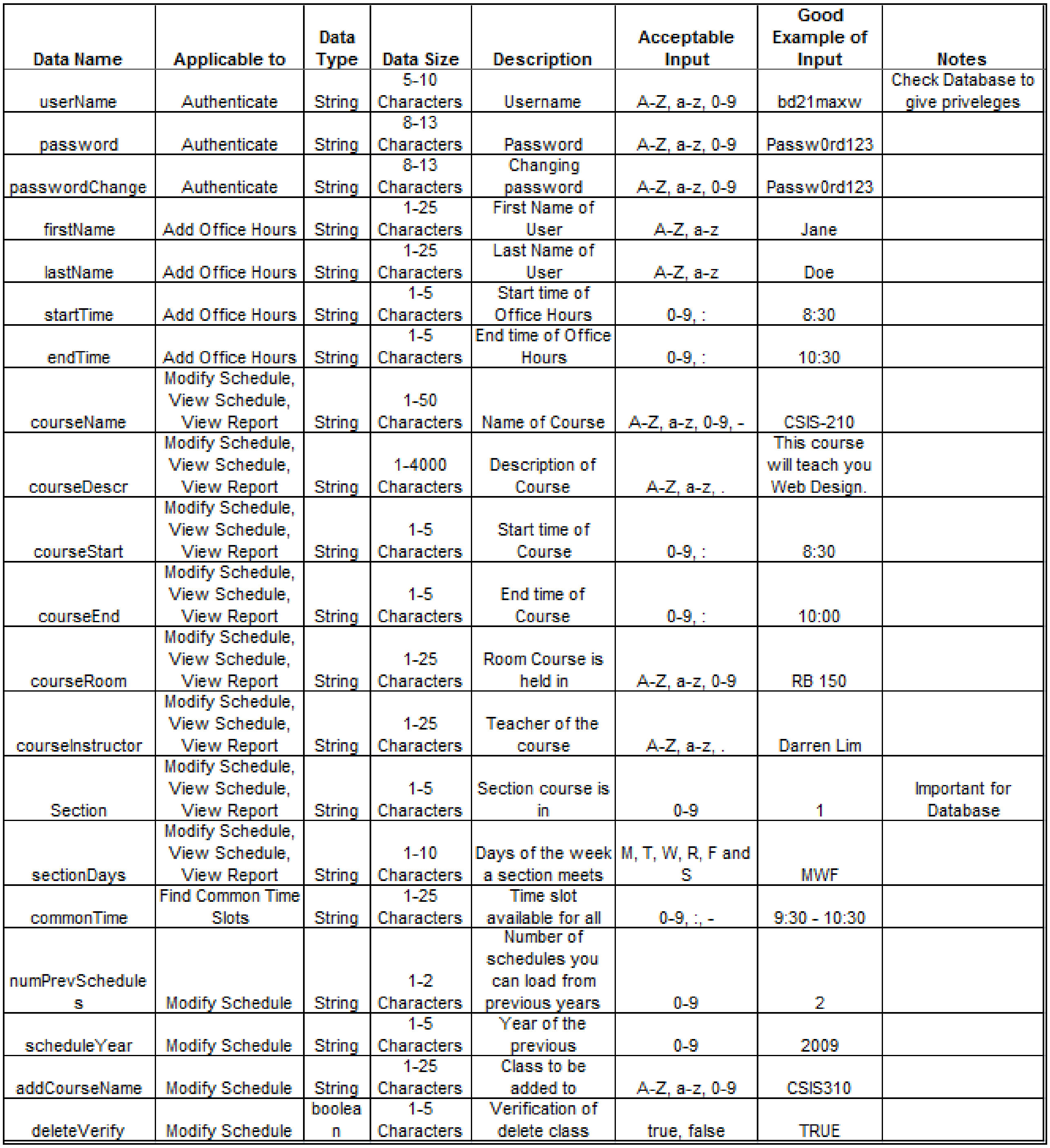
Data Size: The size of the data in terms of it's data type.

Description: A description of what data this entity is storing.

Acceptable Input: What must be inputted by a user in order for the system to accept the data.

Correct Example of Input: An example of data that would be accepted by the system.
Notes: Additional information regarding the data.

Below is a list of all data types available.



Data Name	Applicable to	Data Type	Data Size	Description	Acceptable Input	Good Example of Input	Notes
userName	Authenticate	String	5-10 Characters	Username	A-Z, a-z, 0-9	bd21maxw	Check Database to give priveleges
password	Authenticate	String	8-13 Characters	Password	A-Z, a-z, 0-9	Passw0rd123	
passwordChange	Authenticate	String	8-13 Characters	Changing password	A-Z, a-z, 0-9	Passw0rd123	
firstName	Add Office Hours	String	1-25 Characters	First Name of User	A-Z, a-z	Jane	
lastName	Add Office Hours	String	1-25 Characters	Last Name of User	A-Z, a-z	Doe	
startTime	Add Office Hours	String	1-5 Characters	Start time of Office Hours	0-9, :	8:30	
endTime	Add Office Hours	String	1-5 Characters	End time of Office Hours	0-9, :	10:30	
courseName	Modify Schedule, View Schedule, View Report	String	1-50 Characters	Name of Course	A-Z, a-z, 0-9, -	CSIS-210	
courseDescr	Modify Schedule, View Schedule, View Report	String	1-4000 Characters	Description of Course	A-Z, a-z, .	This course will teach you Web Design.	
courseStart	Modify Schedule, View Schedule, View Report	String	1-5 Characters	Start time of Course	0-9, :	8:30	
courseEnd	Modify Schedule, View Schedule, View Report	String	1-5 Characters	End time of Course	0-9, :	10:00	
courseRoom	Modify Schedule, View Schedule, View Report	String	1-25 Characters	Room Course is held in	A-Z, a-z, 0-9	RB 150	
courseInstructor	Modify Schedule, View Schedule, View Report	String	1-25 Characters	Teacher of the course	A-Z, a-z, .	Darren Lim	
Section	Modify Schedule, View Schedule, View Report	String	1-5 Characters	Section course is in	0-9	1	Important for Database
sectionDays	Modify Schedule, View Schedule, View Report	String	1-10 Characters	Days of the week a section meets	M, T, W, R, F and S	MWF	
commonTime	Find Common Time Slots	String	1-25 Characters	Time slot available for all	0-9, :, -	9:30 - 10:30	
numPrevSchedules	Modify Schedule	String	1-2 Characters	Number of schedules you can load from previous years	0-9	2	
scheduleYear	Modify Schedule	String	1-5 Characters	Year of the previous	0-9	2009	
addCourseName	Modify Schedule	String	1-25 Characters	Class to be added to	A-Z, a-z, 0-9	CSIS310	
deleteVerify	Modify Schedule	boolean	1-5 Characters	Verification of delete class	true, false	TRUE	

2.5 Prototypes

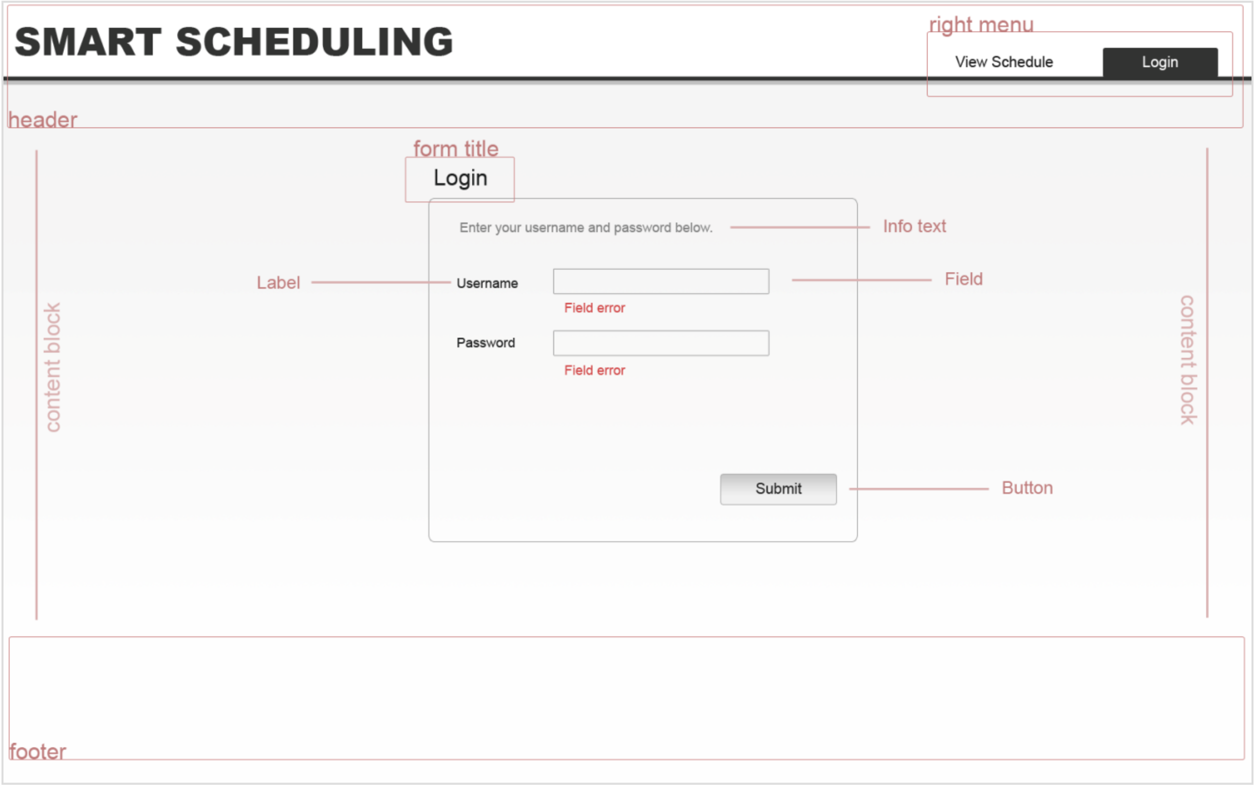
The format for listing our prototypes will be as follows:

- An image showing some key functionality we wish to highlight.
- A bulleted list listing what the page displays (and might display as design changes).
- A description or clarification of elements in the list or image.

The first prototype will be the **Main Template**. The main template outlines the major sections of the website that will be described in the bulleted lists.

It will also serve as an example of how the following prototypes will be listed.

2.5.1 Main Template with Labels



Enter your username and password below.

Header

- Logo
- Right Menu
    - Top Menu
        - The main functions that should be available to each user entering the site.
    - Bottom Menu
        - Additional options such as features. Similar to a toolbox.

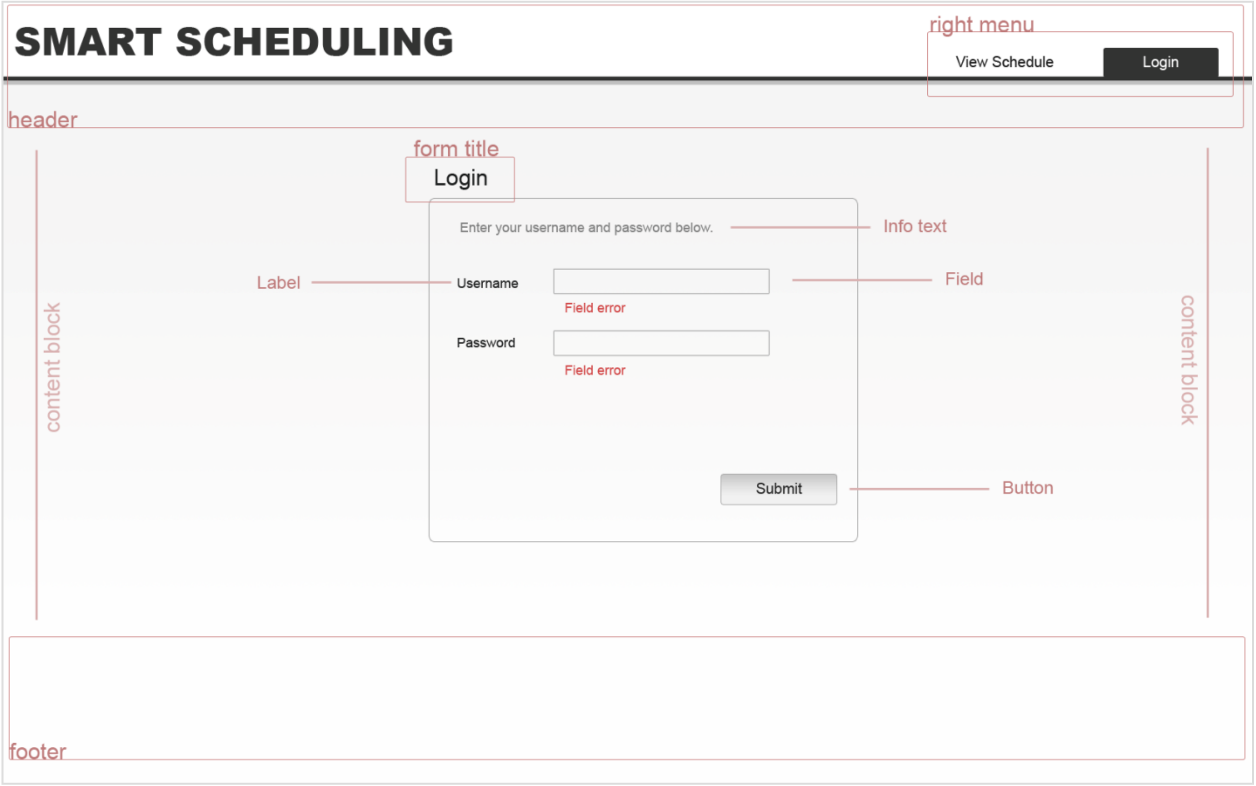
Main Block

- Schedule View
    - How we will output schedule information
        - Calendar View
        - Giant Course List
- Create, Read, Update, Destroy forms
    - Editing and viewing the data of every resource
        - Reading (Viewing)
            - Display the values of all the fields and their labels
        - Updating & Creating
            - Provide a form with all the data fields
            - Populate with current data if updating
    - Error messages
        - Displayed under the field
- Special Functionality
    - Recalling past schedules

Footer

- Copyright Info
- Possible link section on the main page

2.5.2 Login View - Blank (with template outlines)



Enter your username and password below.

Header

- Logo
- Right Menu
    - Top Menu
        - View Schedule
        - Login (selected)
    - Bottom Menu
        - None

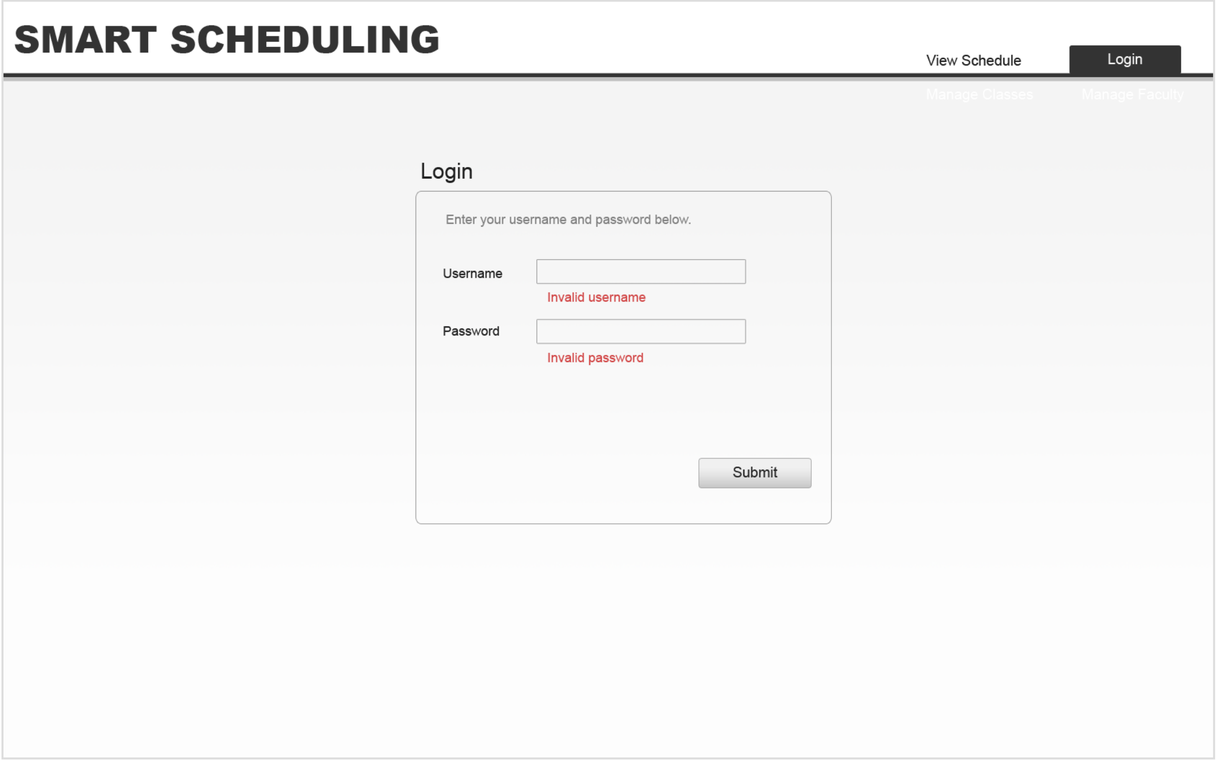
Main Block

- Form View
    - Title
        - Login
    - Fields
        - Username
        - Password
    - Buttons
        - Submit
    - Error messages
        - Displayed under the field

Footer

- Copyright Info
- Possible link section on the main page

2.5.3 Login Screen – Errors



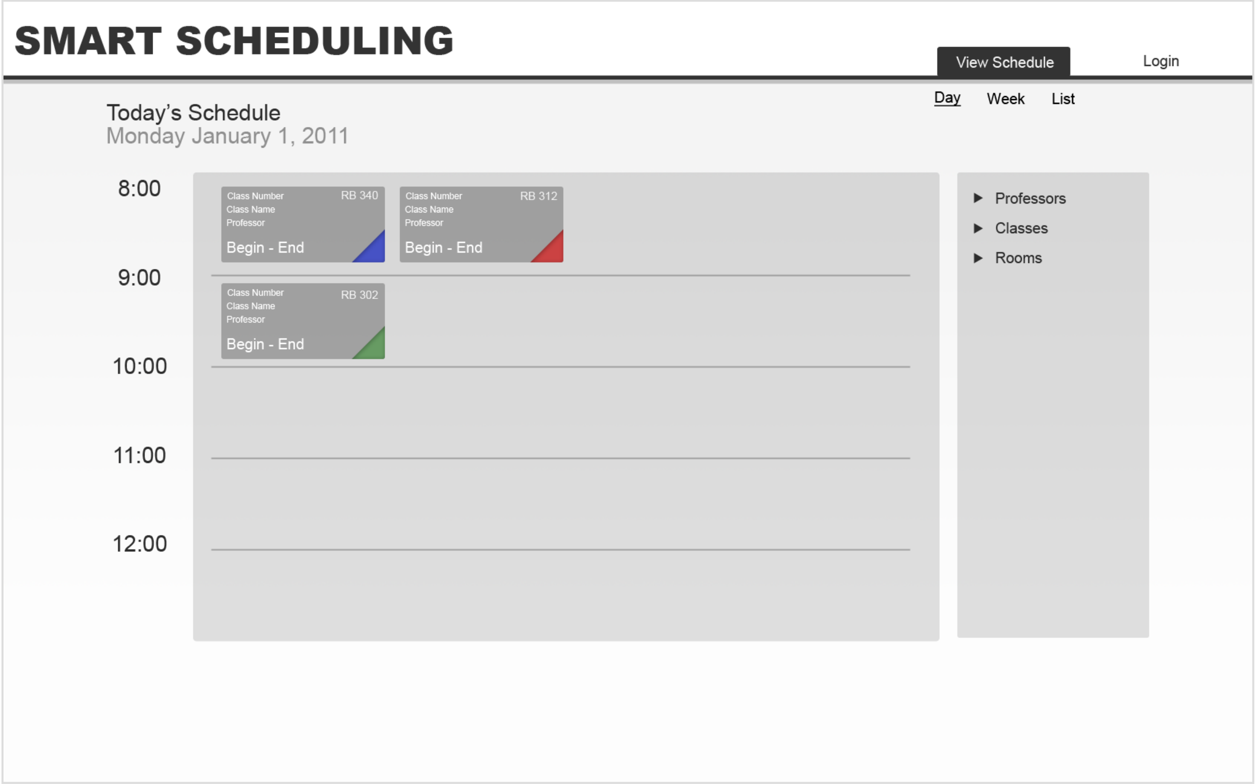
Enter your username and password below.

Invalid username

Invalid password

- Same layout as the blank login screen.
- Field errors appear after form is submitted under their respective field box.
    - These would occur in alignment with our Unit Test constraints.
    - In general cases where data is invalid.

2.5.4 Schedule View – Single Day



Header

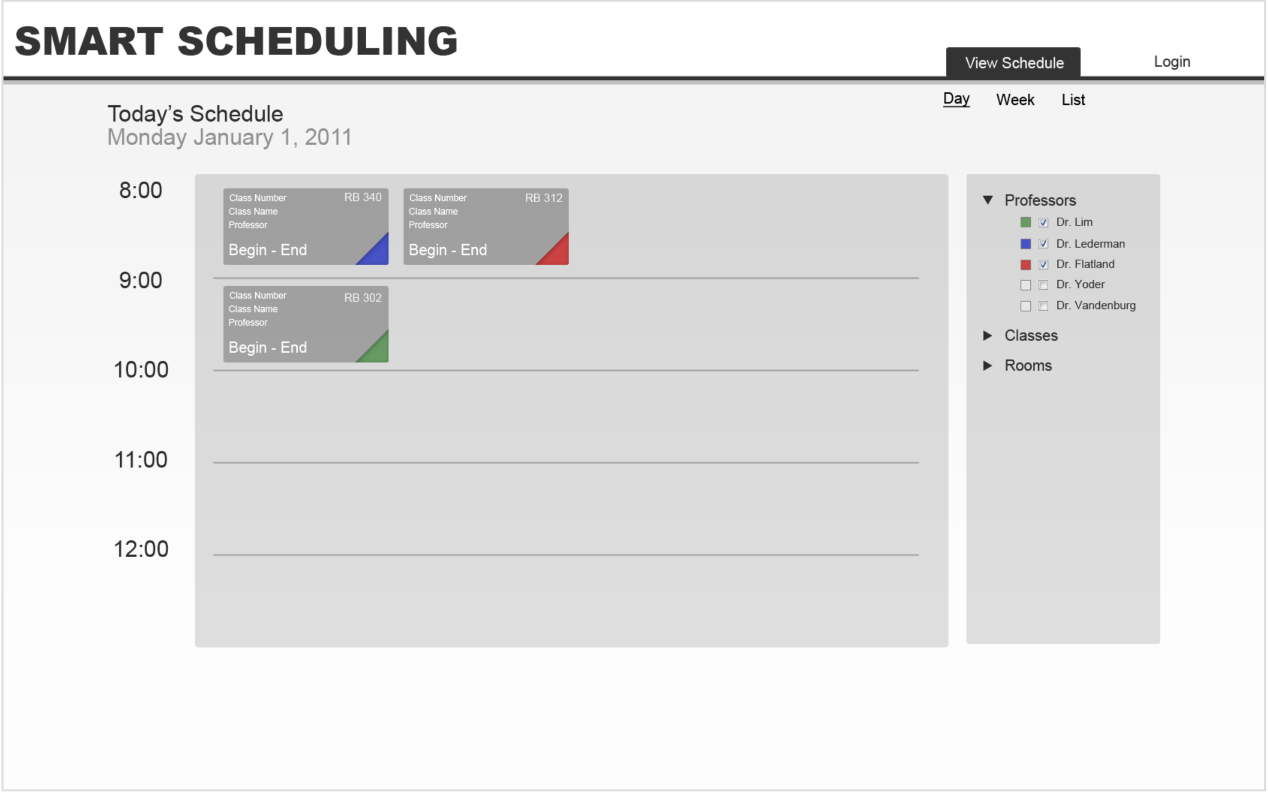
- Right Menu
  - Top Menu
    - View Schedule is highlighted
  - Bottom Menu
    - Links to Class and Faculty management

Main Block

- Schedule View
  - Day Block (left column)
    - Class Items
      - Class information
  - Selector Box (right column)
    - Filter categories for Professors, Classes, Rooms

This is the basic day view of the scheduling system.
It will reflect all changes made to class information.

2.5.5 Schedule View – Day View - Filter Example



🟩 ☑ Dr. Lim
🟦 ☑ Dr. Lederman
🟥 ☑ Dr. Flatland
□ □ Dr. Yoder
□ □ Dr. Vandenburg

This shows how filters in the right hand column can be applied to the schedule.
The user will have the ability to click on a colored box to show/hide highlighting in the schedule.
The user will have the ability to hide and show items that match the filter with the check boxes.
When a category is contracted (and the user has not made any changes yet) it is assumed that all items will be shown.

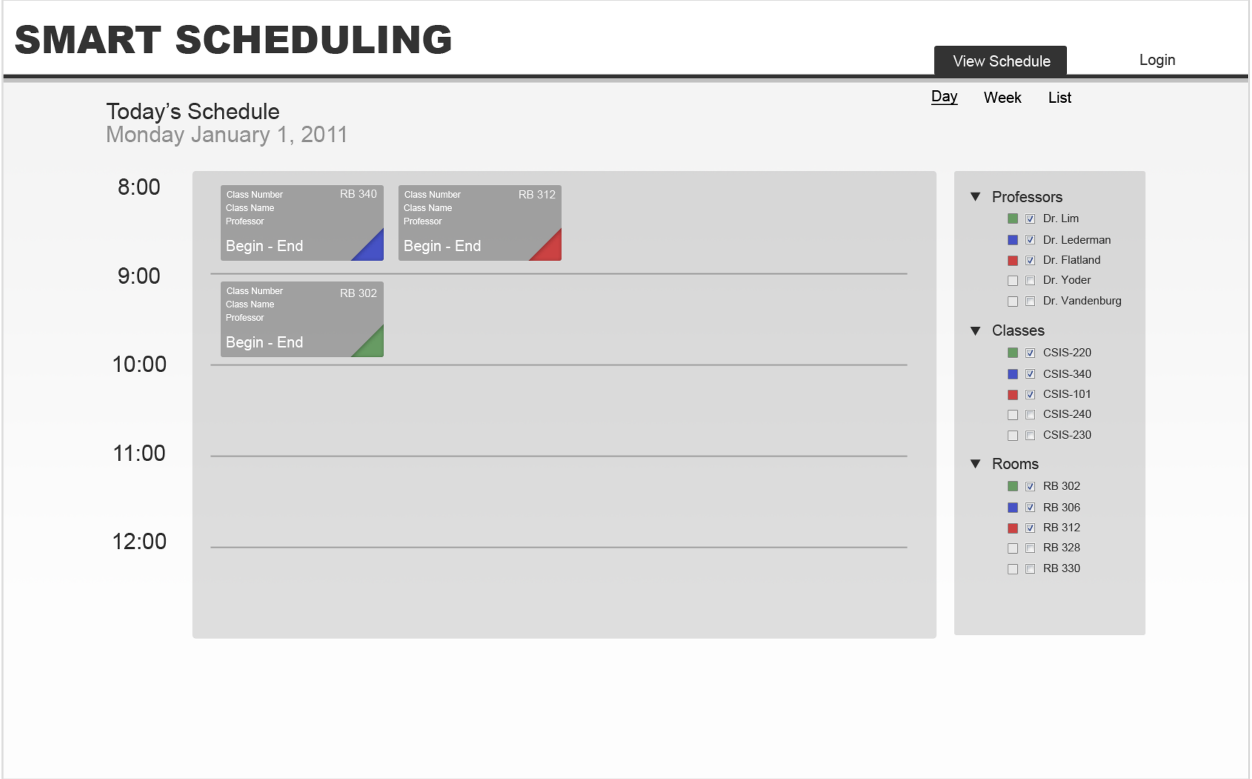
Header

- Right Menu – Same as the master day view

Main Block

- Schedule View
    - Day Block (left column)
        - Class Items
            - Class information
            - **Filter highlighting tab (colored corners)**
    - Selector Box (right column)
        - Filter categories for Professors, Classes, Rooms
            - Expanded Professors Category
                - Highlighting selector (colored boxes)
                - View/Hide item checkbox

2.5.6 Schedule View – Filter Example – All Filtered



Today's Schedule
Monday January 1, 2011

8:00

Class Number RB 340
Class Name
Professor
Begin - End

Class Number RB 312
Class Name
Professor
Begin - End

9:00

Class Number RB 302
Class Name
Professor
Begin - End

10:00

11:00

12:00

▼ Professors
- 🟩 ☑ Dr. Lim
- 🟦 ☑ Dr. Lederman
- 🟥 ☑ Dr. Flatland
- □ □ Dr. Yoder
- □ □ Dr. Vandenburg

▼ Classes
- 🟩 ☑ CSIS-220
- 🟦 ☑ CSIS-340
- 🟥 ☑ CSIS-101
- □ □ CSIS-240
- □ □ CSIS-230

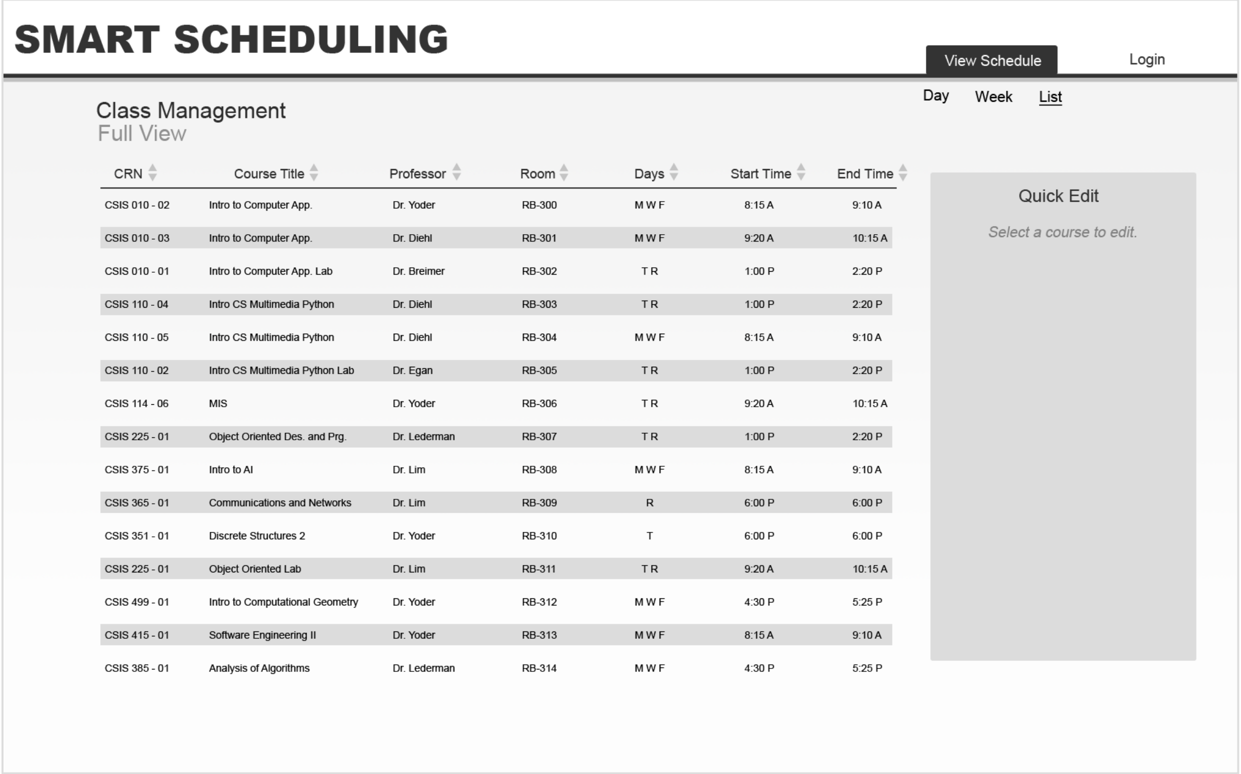
▼ Rooms
- 🟩 ☑ RB 302
- 🟦 ☑ RB 306
- 🟥 ☑ RB 312
- □ □ RB 328
- □ □ RB 330

Header
- Right Menu – Same as the master day view

Main Block
- Schedule View
    - Day Block (left column)
        - Class Items
            - Class information
            - **Filter highlighting tabs**
    - Selector Box (right column)
        - Filter categories for Professors, Classes, Rooms
            - All sections expanded
                - Highlighting selector (colored boxes)
                - View/Hide item checkbox

This shows the ability to filter by multiple different resources.

2.5.7 Schedule View – List View



Class Management
Full View

CRN	Course Title	Professor	Room	Days	Start Time	End Time
CSIS 010 - 02	Intro to Computer App.	Dr. Yoder	RB-300	M W F	8:15 A	9:10 A
CSIS 010 - 03	Intro to Computer App.	Dr. Diehl	RB-301	M W F	9:20 A	10:15 A
CSIS 010 - 01	Intro to Computer App. Lab	Dr. Breimer	RB-302	T R	1:00 P	2:20 P
CSIS 110 - 04	Intro CS Multimedia Python	Dr. Diehl	RB-303	T R	1:00 P	2:20 P
CSIS 110 - 05	Intro CS Multimedia Python	Dr. Diehl	RB-304	M W F	8:15 A	9:10 A
CSIS 110 - 02	Intro CS Multimedia Python Lab	Dr. Egan	RB-305	T R	1:00 P	2:20 P
CSIS 114 - 06	MIS	Dr. Yoder	RB-306	T R	9:20 A	10:15 A
CSIS 225 - 01	Object Oriented Des. and Prg.	Dr. Lederman	RB-307	T R	1:00 P	2:20 P
CSIS 375 - 01	Intro to AI	Dr. Lim	RB-308	M W F	8:15 A	9:10 A
CSIS 365 - 01	Communications and Networks	Dr. Lim	RB-309	R	6:00 P	6:00 P
CSIS 351 - 01	Discrete Structures 2	Dr. Yoder	RB-310	T	6:00 P	6:00 P
CSIS 225 - 01	Object Oriented Lab	Dr. Lim	RB-311	T R	9:20 A	10:15 A
CSIS 499 - 01	Intro to Computational Geometry	Dr. Yoder	RB-312	M W F	4:30 P	5:25 P
CSIS 415 - 01	Software Engineering II	Dr. Yoder	RB-313	M W F	8:15 A	9:10 A
CSIS 385 - 01	Analysis of Algorithms	Dr. Lederman	RB-314	M W F	4:30 P	5:25 P

Quick Edit

Select a course to edit.

Header

- Right Menu – Same as the master day view

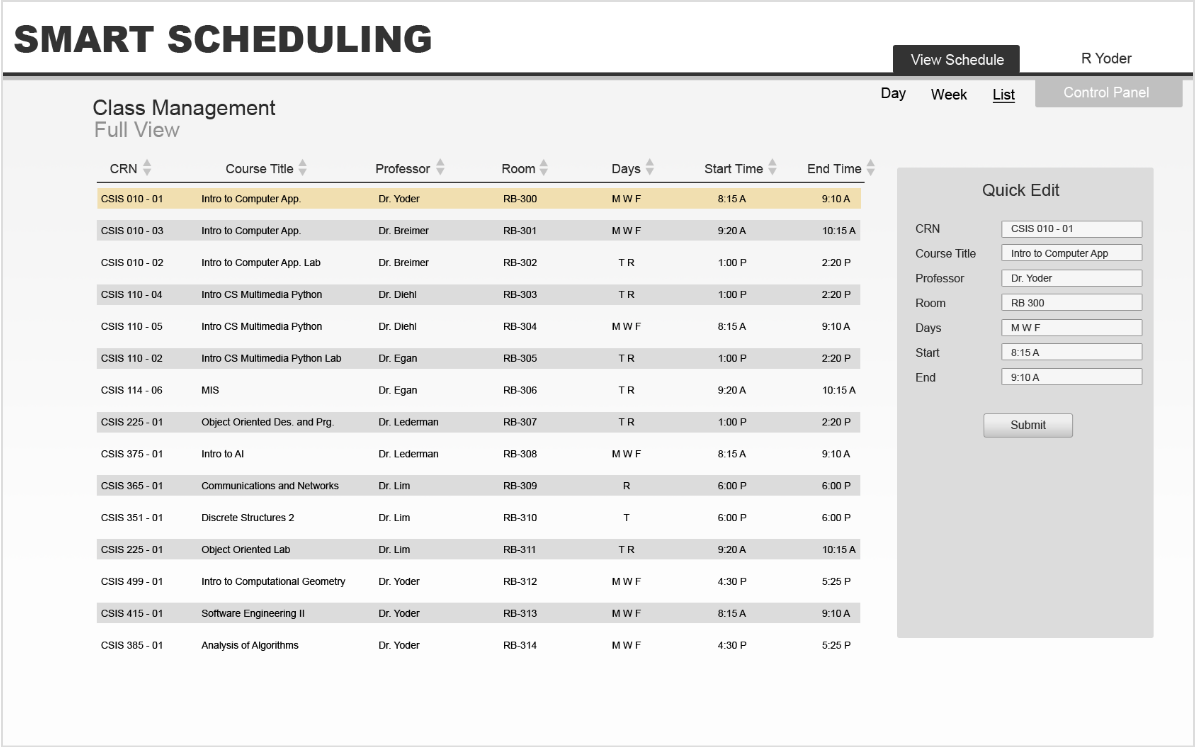
Main Block

- List View
  - List all scheduled classes in a table format
    - CRN
    - Course Title
    - Professor
    - Room
    - Days
    - Start/End Time
  - In the future links may be included to redirect user to an editing page.
  - Quick Edit
    - Next prototype

This view can only be accessed by the course coordinator.

The next few prototypes show some of the functionality used to manage the schedule.

2.5.8 Schedule View – List View – Quick Editing



Class Management
Full View

CRN	Course Title	Professor	Room	Days	Start Time	End Time
CSIS 010 - 01	Intro to Computer App.	Dr. Yoder	RB-300	M W F	8:15 A	9:10 A
CSIS 010 - 03	Intro to Computer App.	Dr. Breimer	RB-301	M W F	9:20 A	10:15 A
CSIS 010 - 02	Intro to Computer App. Lab	Dr. Breimer	RB-302	T R	1:00 P	2:20 P
CSIS 110 - 04	Intro CS Multimedia Python	Dr. Diehl	RB-303	T R	1:00 P	2:20 P
CSIS 110 - 05	Intro CS Multimedia Python	Dr. Diehl	RB-304	M W F	8:15 A	9:10 A
CSIS 110 - 02	Intro CS Multimedia Python Lab	Dr. Egan	RB-305	T R	1:00 P	2:20 P
CSIS 114 - 06	MIS	Dr. Egan	RB-306	T R	9:20 A	10:15 A
CSIS 225 - 01	Object Oriented Des. and Prg.	Dr. Lederman	RB-307	T R	1:00 P	2:20 P
CSIS 375 - 01	Intro to AI	Dr. Lederman	RB-308	M W F	8:15 A	9:10 A
CSIS 365 - 01	Communications and Networks	Dr. Lim	RB-309	R	6:00 P	6:00 P
CSIS 351 - 01	Discrete Structures 2	Dr. Lim	RB-310	T	6:00 P	6:00 P
CSIS 225 - 01	Object Oriented Lab	Dr. Lim	RB-311	T R	9:20 A	10:15 A
CSIS 499 - 01	Intro to Computational Geometry	Dr. Yoder	RB-312	M W F	4:30 P	5:25 P
CSIS 415 - 01	Software Engineering II	Dr. Yoder	RB-313	M W F	8:15 A	9:10 A
CSIS 385 - 01	Analysis of Algorithms	Dr. Yoder	RB-314	M W F	4:30 P	5:25 P

Quick Edit

CRN	CSIS 010 - 01
Course Title	Intro to Computer App
Professor	Dr. Yoder
Room	RB 300
Days	M W F
Start	8:15 A
End	9:10 A

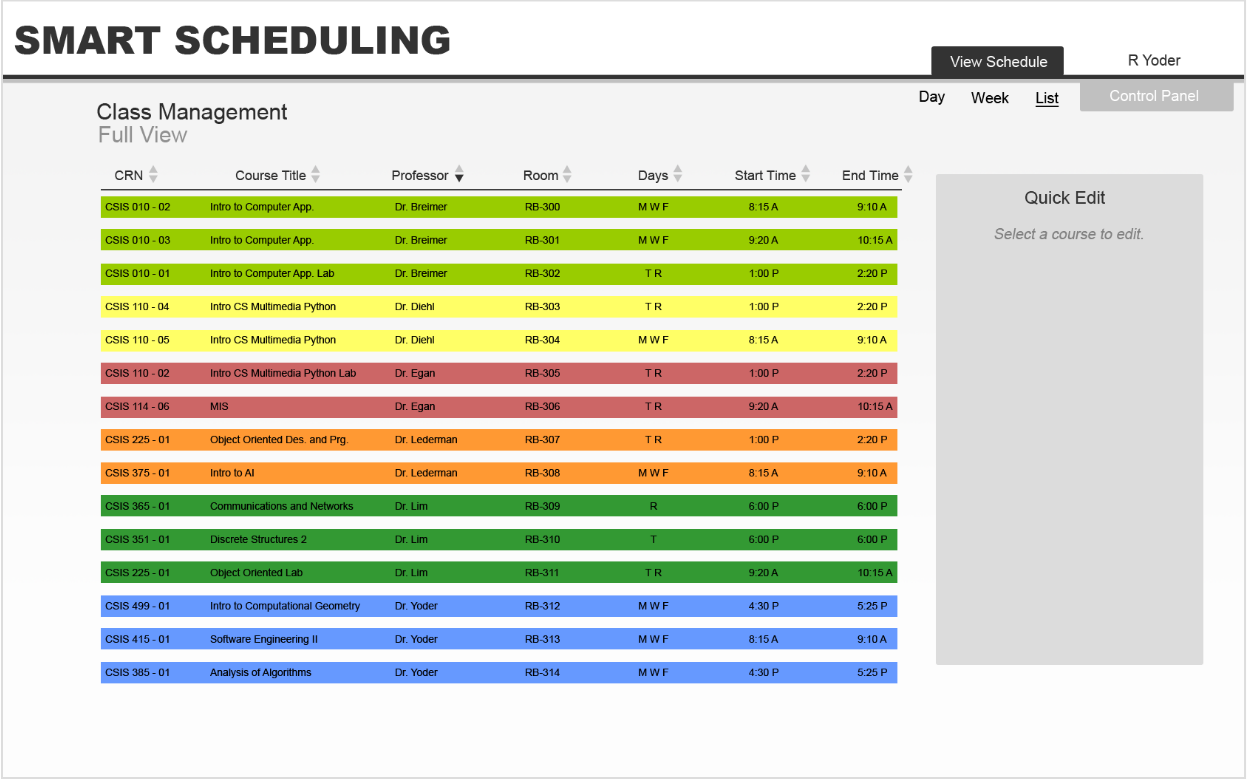
Header

- Right Menu – Same as the master day view

Main Block

- List View
  - List all scheduled classes in a table format
  - Quick Edit
    - Course highlighted in orange (first list item) appears in the quick edit box.
    - Coordinator can quickly edit the item's details and resubmit it as long as there are no conflicts.

2.5.9 Schedule View – Sorting Example



Class Management
Full View

CRN	Course Title	Professor	Room	Days	Start Time	End Time
CSIS 010 - 02	Intro to Computer App.	Dr. Breimer	RB-300	M W F	8:15 A	9:10 A
CSIS 010 - 03	Intro to Computer App.	Dr. Breimer	RB-301	M W F	9:20 A	10:15 A
CSIS 010 - 01	Intro to Computer App. Lab	Dr. Breimer	RB-302	T R	1:00 P	2:20 P
CSIS 110 - 04	Intro CS Multimedia Python	Dr. Diehl	RB-303	T R	1:00 P	2:20 P
CSIS 110 - 05	Intro CS Multimedia Python	Dr. Diehl	RB-304	M W F	8:15 A	9:10 A
CSIS 110 - 02	Intro CS Multimedia Python Lab	Dr. Egan	RB-305	T R	1:00 P	2:20 P
CSIS 114 - 06	MIS	Dr. Egan	RB-306	T R	9:20 A	10:15 A
CSIS 225 - 01	Object Oriented Des. and Prg.	Dr. Lederman	RB-307	T R	1:00 P	2:20 P
CSIS 375 - 01	Intro to AI	Dr. Lederman	RB-308	M W F	8:15 A	9:10 A
CSIS 365 - 01	Communications and Networks	Dr. Lim	RB-309	R	6:00 P	6:00 P
CSIS 351 - 01	Discrete Structures 2	Dr. Lim	RB-310	T	6:00 P	6:00 P
CSIS 225 - 01	Object Oriented Lab	Dr. Lim	RB-311	T R	9:20 A	10:15 A
CSIS 499 - 01	Intro to Computational Geometry	Dr. Yoder	RB-312	M W F	4:30 P	5:25 P
CSIS 415 - 01	Software Engineering II	Dr. Yoder	RB-313	M W F	8:15 A	9:10 A
CSIS 385 - 01	Analysis of Algorithms	Dr. Yoder	RB-314	M W F	4:30 P	5:25 P

Header

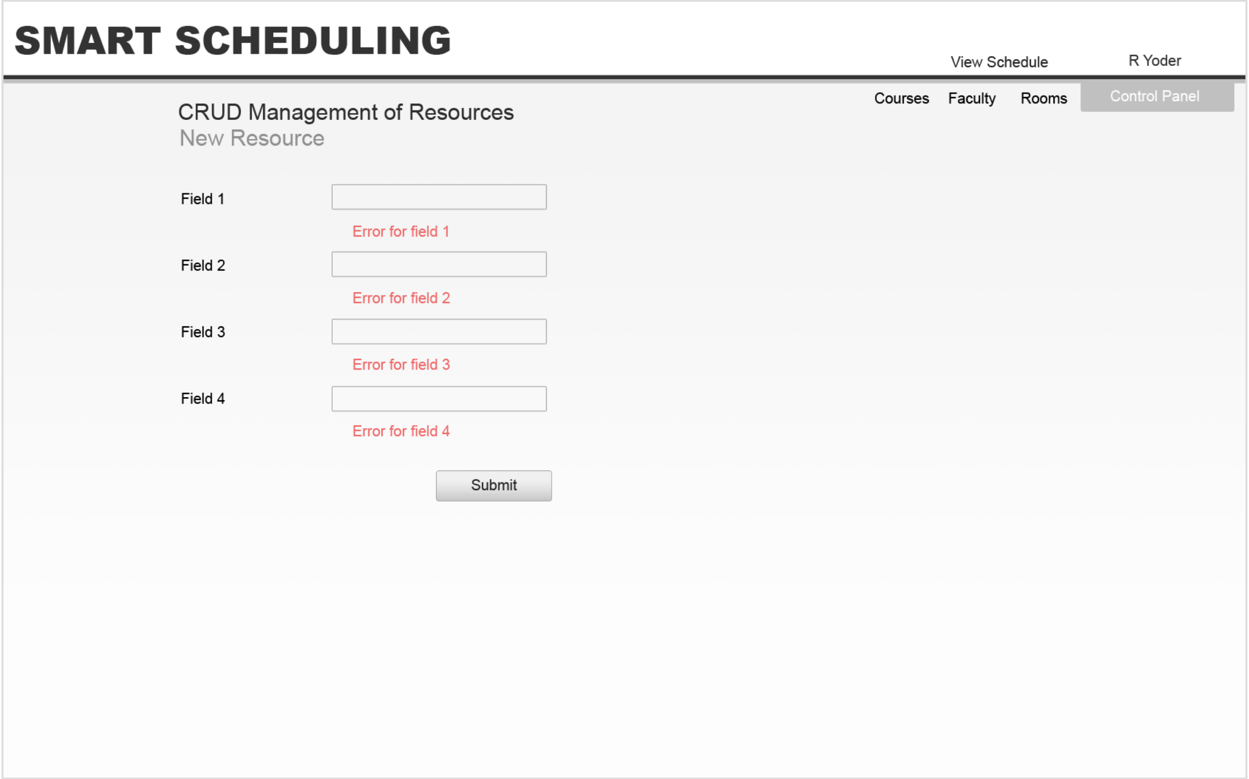
- Right Menu – Same as the master day view

Main Block

- List View
  - List all scheduled classes in a table format
    - Sorting Arrows
      - Next to each category. Sorts the rows by the respective piece of data
        - Alpha numeric
        - Custom order (MWF, TR, T, R)
        - Times

A potential way to view the list sorted and highlighted by the category chosen. Color management not shown, but could be potentially implemented.

2.5.10 Resource View – Management



CRUD Management of Resources
New Resource

Field 1
Error for field 1
Field 2
Error for field 2
Field 3
Error for field 3
Field 4
Error for field 4

Resources like course, professors, and rooms will need to be manageable; therefore they should follow a generic template like the one above.

The following is a generic list layout covering all the potential pages.

Header

- Right Menu – Same as the master day view
- Coordinator is logged in (R Yoder)

Main Block

- Title
    - CRUD Management of Resources
        - Temporary Title
    - New Resource
        - Replace resource with Course, Professor or Room
- When editing a resource, fields will be populated with their current values
- New resources will be blank
- Field List for each resource
    - Course

- CRN - text
- Room
    - Possible dropdown with available options
- Professor
    - Possible dropdown with available options
- Times – Start End
    - Possible dropdown with available options
- Professor
    - First Name – Text
    - Last Name – Text
- Room
    - Room Number
- Error messages due to conflicts or improper data will appear on the edit page. Preferably under the suspect field, but might also be compiled in a box above or below.

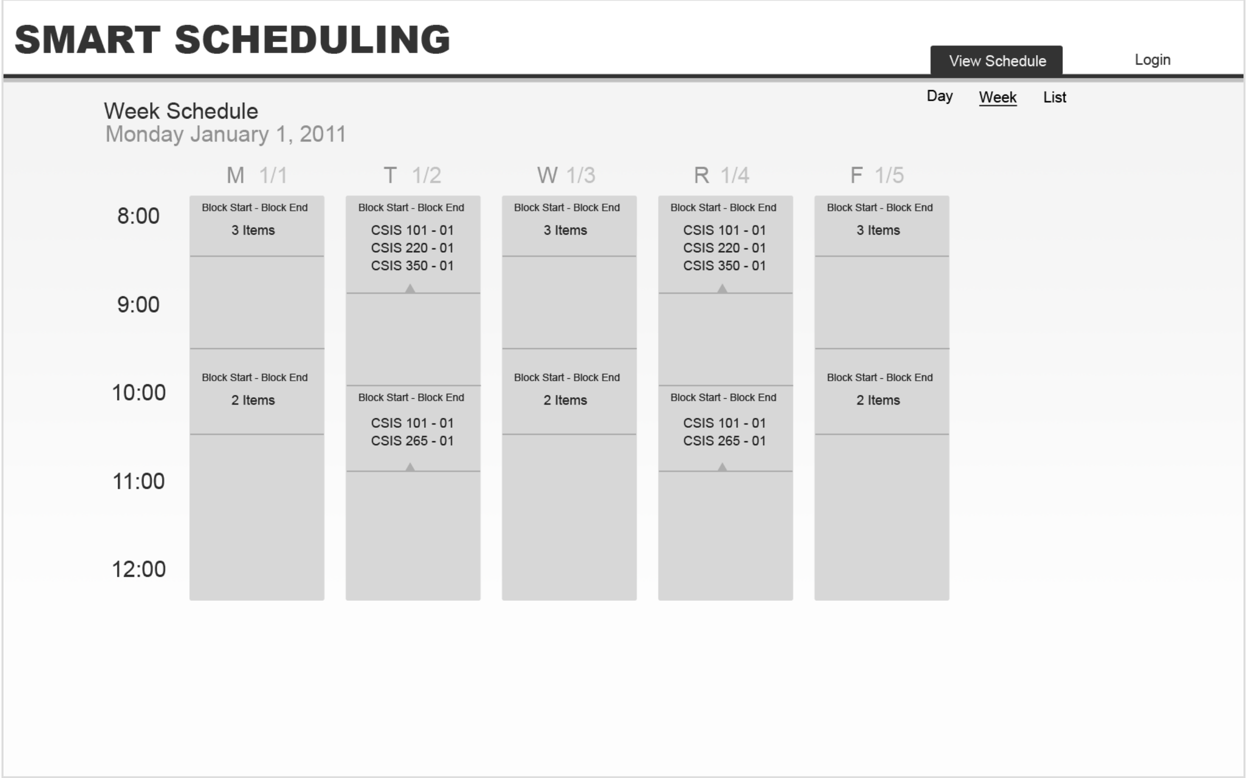
This is meant to be a generic layout for the backend CRUD system. CRUD stands for create, read, update, delete. For each of our resources we will need to be able to edit the values of each entry and create new ones.

The user will be able to come to a crud page either by clicking on a resource (ex. Dr. Flatland) which would allow them to edit the details of that professor.

You could also come to a crud page from a ‘create new’ link when a new professor, course, or room needs to be added.

All of these pages will have the same generic structure, field labels with the actual fields and a confirm button.

2.5.11 Schedule View – Week View



Week Schedule
Monday January 1, 2011

	M 1/1	T 1/2	W 1/3	R 1/4	F 1/5
8:00	Block Start - Block End 3 Items	Block Start - Block End CSIS 101 - 01 CSIS 220 - 01 CSIS 350 - 01	Block Start - Block End 3 Items	Block Start - Block End CSIS 101 - 01 CSIS 220 - 01 CSIS 350 - 01	Block Start - Block End 3 Items
9:00					
10:00	Block Start - Block End 2 Items	Block Start - Block End CSIS 101 - 01 CSIS 265 - 01	Block Start - Block End 2 Items	Block Start - Block End CSIS 101 - 01 CSIS 265 - 01	Block Start - Block End 2 Items
11:00					
12:00					

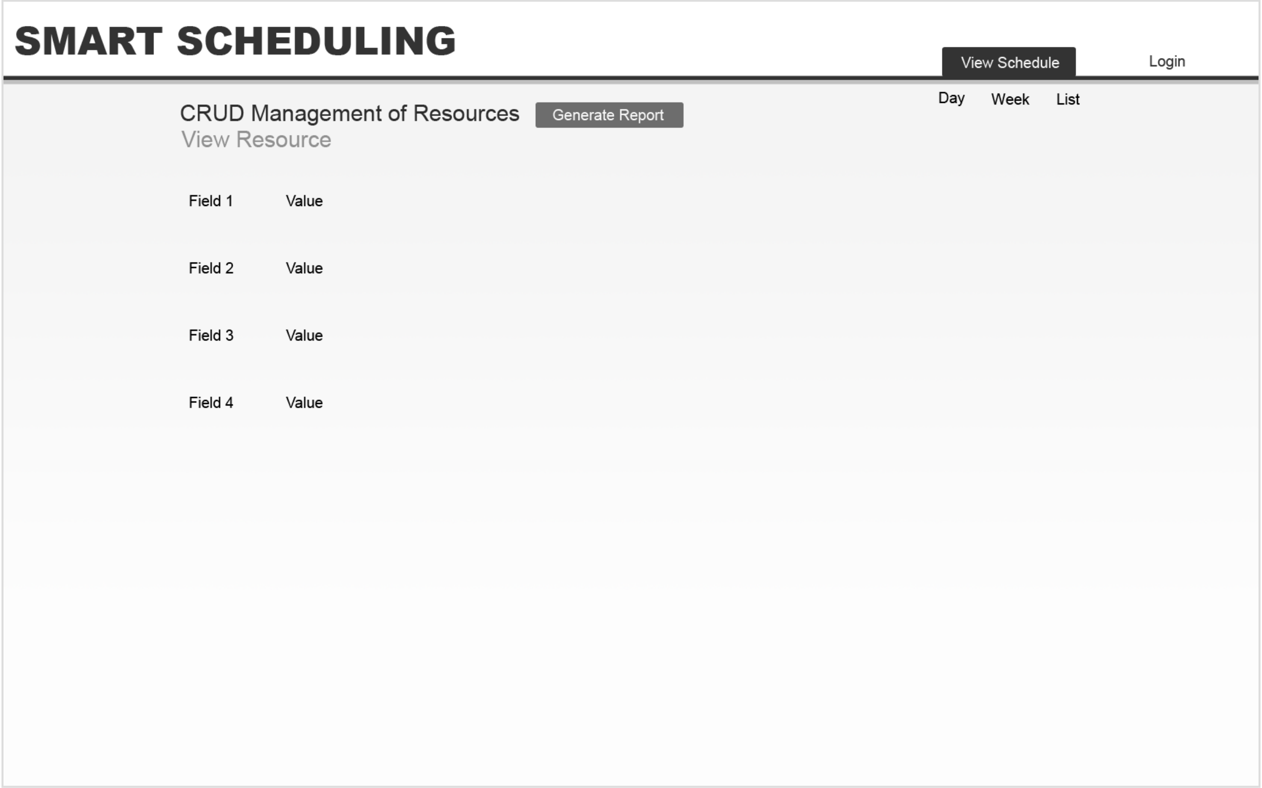
Header

- Right Menu – Same as the master day view

Main Block

- Title
  - Week Schedule
  - Week start day (Monday the first in this example)
- Week View
  - List all scheduled classes in a table format
    - Items listed in time block groups
    - Blocks can be expanded to view detail
      - User can then click on an item to view details (course number could link to day of week)

2.5.12 Resource View – Viewing a Resource



CRUD Management of Resources

View Resource

Field 1	Value
Field 2	Value
Field 3	Value
Field 4	Value

Header

- View Schedule highlighted

Main Block

- Title
    - Resource Management or other main title
    - Name of resource
        - Faculty name
        - Room Number
        - Course Number
- Generate Report
    - Directs you to a printer friendly format of that specific resource's weekly schedule
- Data
    - The field names as they apply to resources
        - First name
        - Last name
        - Room Number
        - etc
    - The values of the fields
        - Names
        - Room Numbers
        - Times
        - Etc

2.6 Test Plan

2.6.1 Acceptance Criteria and Testing Plan

A software project test plan is a document that describes the objectives, scope, approach, and focus of a software testing effort. The process of preparing a test plan is a useful way to think through the efforts needed to validate the acceptability of a software product. The completed test plan will serve to help anyone that is not involved in the testing to understand the 'why' and 'how' of product validation. The test plan documents the approach that will be used to authenticate and make certain that a product or system that is being tested meets the requirements and other conditions.

The acceptance criteria will be determined by the functional requirements inventory listed in section 1.3 of this document and the non-functional requirements inventory listed in section 1.4 of this document. By definition, functional requirements are what the system will be able to do and what is testable about the system while in contrast, the non-functional requirements define how the system will be; the elements of the system that are not testable. At the completion of this project, team Empire Unlimited will determine which of these requirements were met and which were not met. Please refer to the sections listed above, functional and non-functional requirements, to see the complete listing but keep in mind that these requirements are subject to change and can be added to as more information is gathered.

Smart Scheduling will be tested on both Windows and Mac operating systems and with the four major browsers Internet Explorer 7 and 8, Mozilla Firefox, Safari and Google Chrome. Testing requirements will be decided upon and developed by Empire Unlimited. The first set of tests will be a set of individual unit tests that will break the system down into separate modules. Each individual unit of the module will be tested separately from every other unit and module. Once it has been determined that each individual unit works correctly, the module test will be performed, which will test all units of that module together. Next the integration test will be preformed. This test will bring all the modules together to be tested and make sure they run properly. The system test will be a combination of all tests. This will connect all of the units and modules and bring the entire system back together to be tested further as one whole entity. In the next document, the Detailed Design, tests will be written out for each unit and then the results of all of these tests will be presented in the Acceptance Test document where it will be determined whether or not all requirements were met.

2.6.2 Unit Test Directory

The following is a list of all separate units that will be tested. Once each of these unit tests passes, a full system test will be performed to ensure correctness and efficiency.

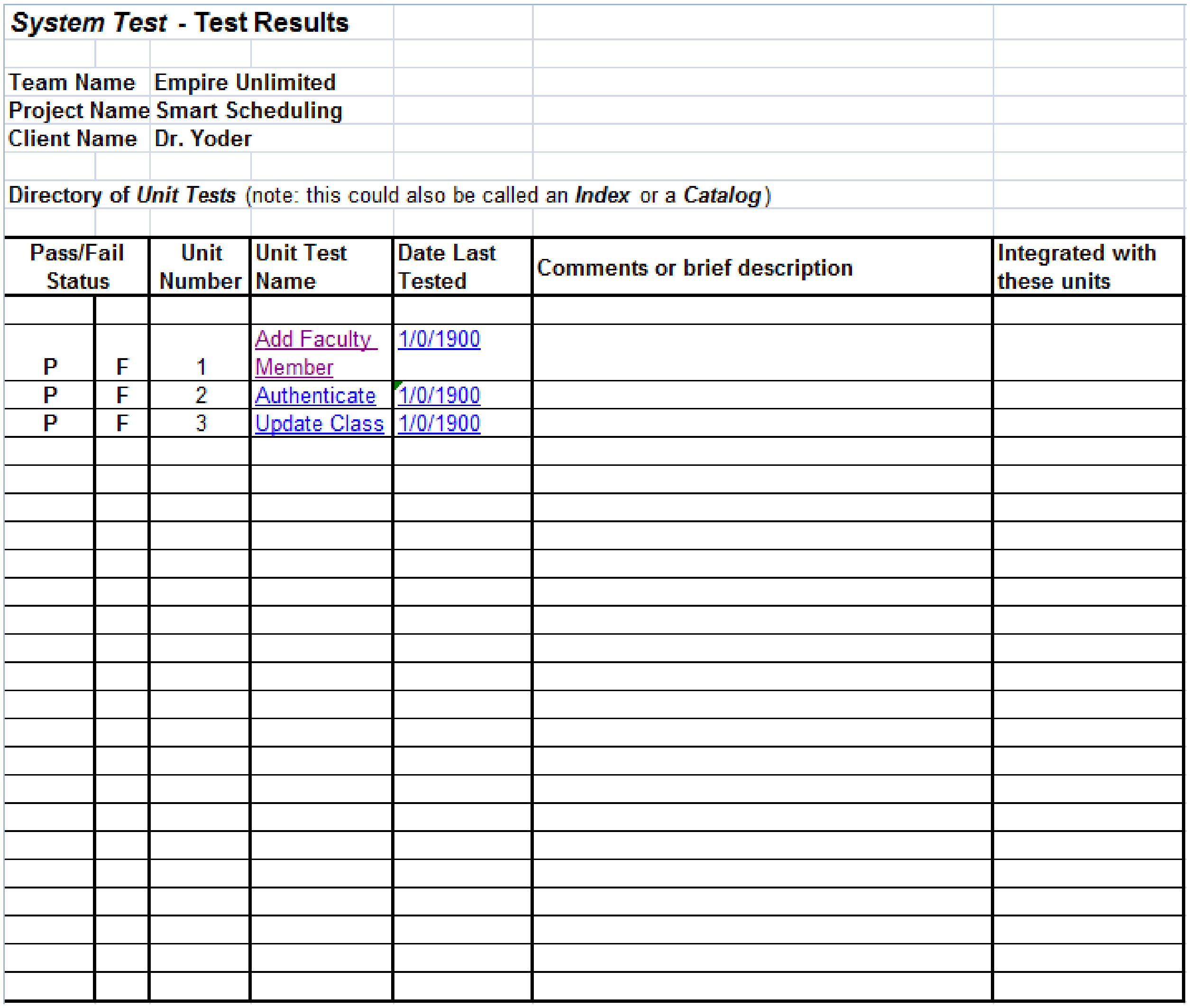
List of Units

Add Faculty member
Authenticate
Update Class

2.6.3 Unit Test Cases

A test case includes the test number and description of the test. The action to be performed, or the input entered by the user, the state before the test, and the expected result are described for the three units below. There are cases described for the correct actions of users as well as incorrect actions. After the tests have actually been performed, the observed results will be recorded.

2.6.3.1 Directory of Unit Test



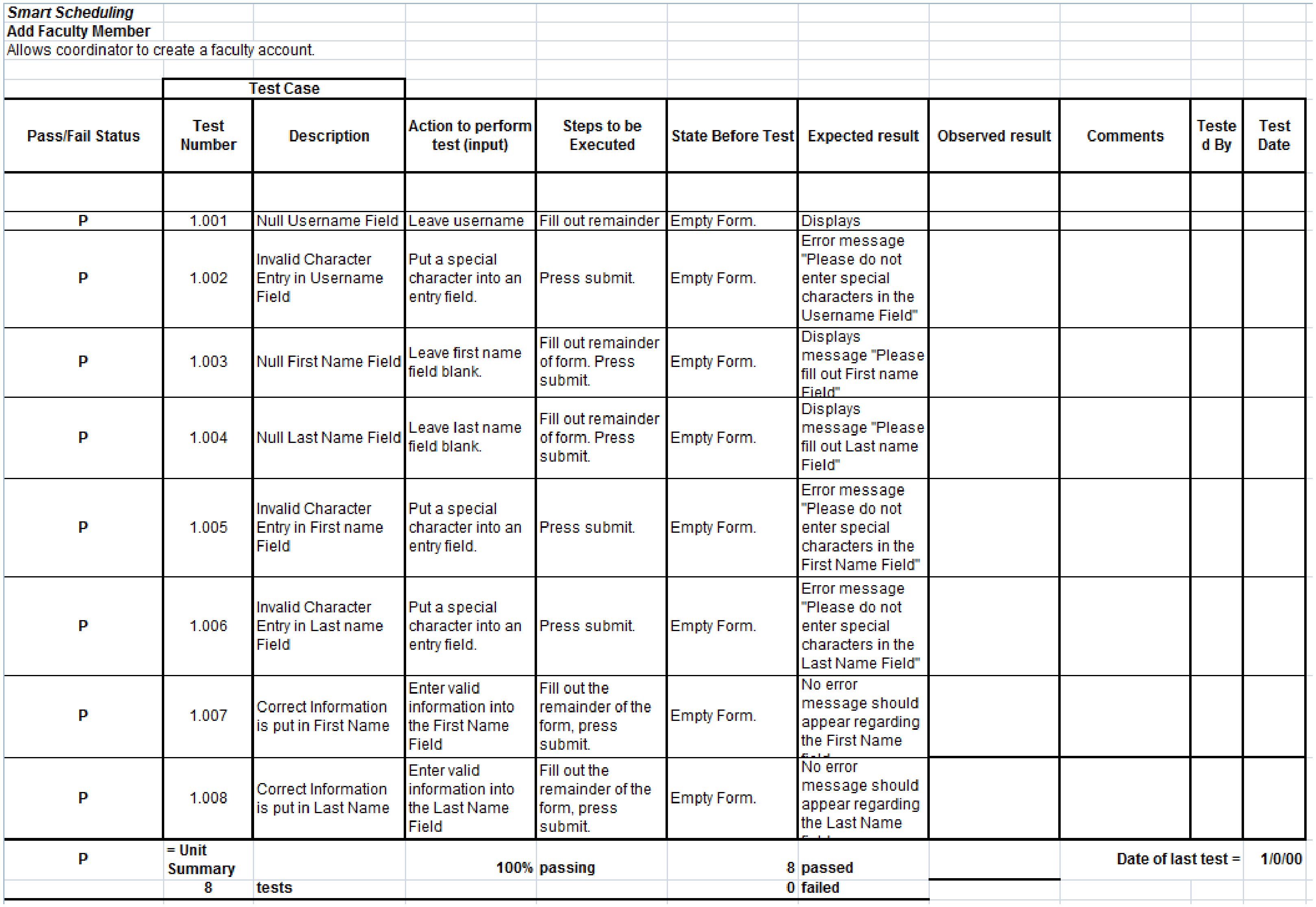
***System Test* - Test Results**

Team Name	Empire Unlimited
Project Name	Smart Scheduling
Client Name	Dr. Yoder

Directory of *Unit Tests* (note: this could also be called an ***Index*** or a ***Catalog***)

Pass/Fail Status		Unit Number	Unit Test Name	Date Last Tested	Comments or brief description	Integrated with these units
P	F	1	Add Faculty Member	1/0/1900		
P	F	2	Authenticate	1/0/1900		
P	F	3	Update Class	1/0/1900		

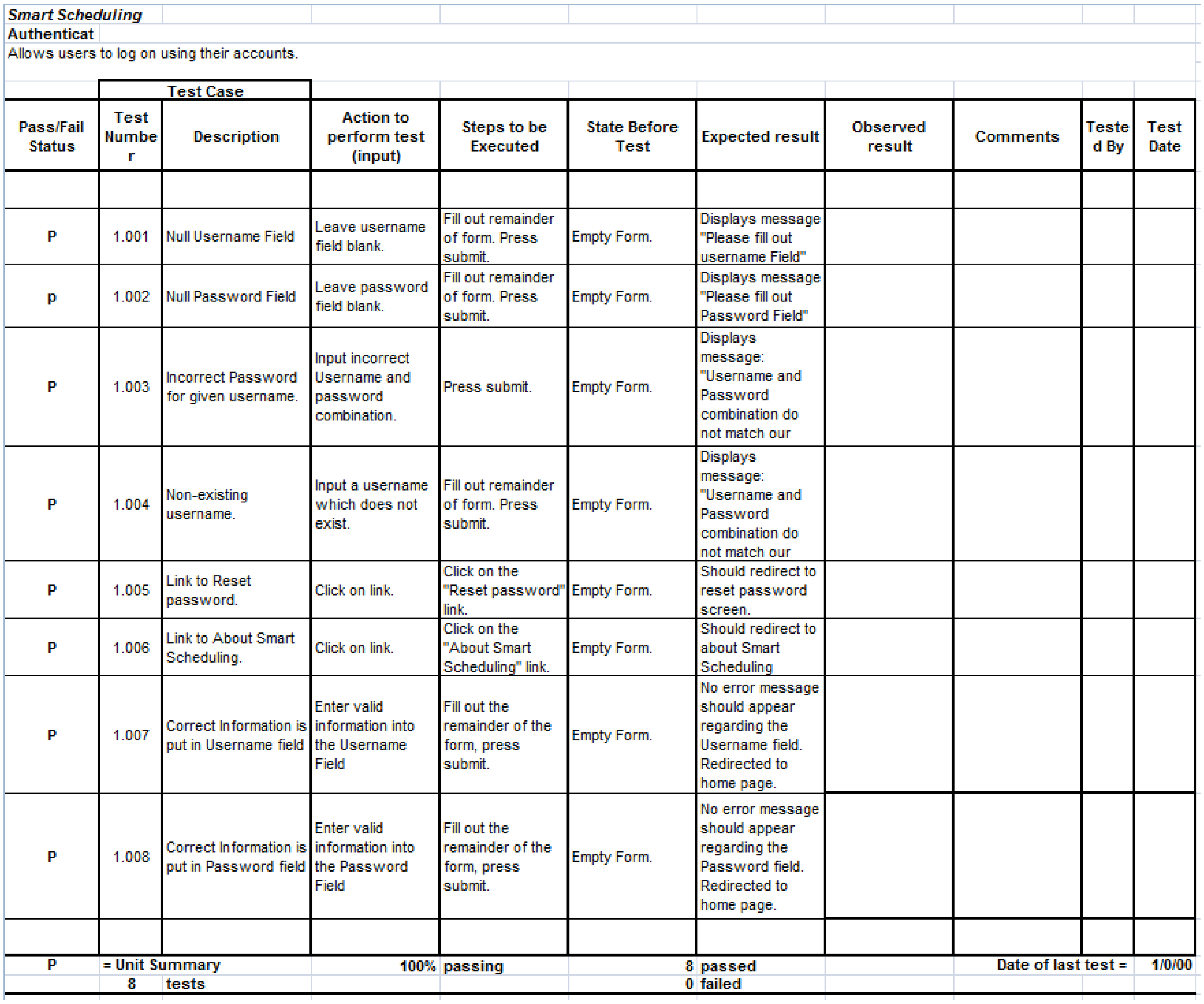
2.6.3.2 Add Faculty Member



Smart Scheduling
Add Faculty Member
Allows coordinator to create a faculty account.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Teste d By**	**Test Date**
P	1.001	Null Username Field	Leave username	Fill out remainder	Empty Form.	Displays				
P	1.002	Invalid Character Entry in Username Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the Username Field"				
P	1.003	Null First Name Field	Leave first name field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out First name Field"				
P	1.004	Null Last Name Field	Leave last name field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out Last name Field"				
P	1.005	Invalid Character Entry in First name Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the First Name Field"				
P	1.006	Invalid Character Entry in Last name Field	Put a special character into an entry field.	Press submit.	Empty Form.	Error message "Please do not enter special characters in the Last Name Field"				
P	1.007	Correct Information is put in First Name	Enter valid information into the First Name Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the First Name				
P	1.008	Correct Information is put in Last Name	Enter valid information into the Last Name Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Last Name				
P	**= Unit Summary**		**100%**	**passing**	**8**	**passed**		**Date of last test =**		**1/0/00**
	8	**tests**			**0**	**failed**				

2.6.3.3 Authenticate



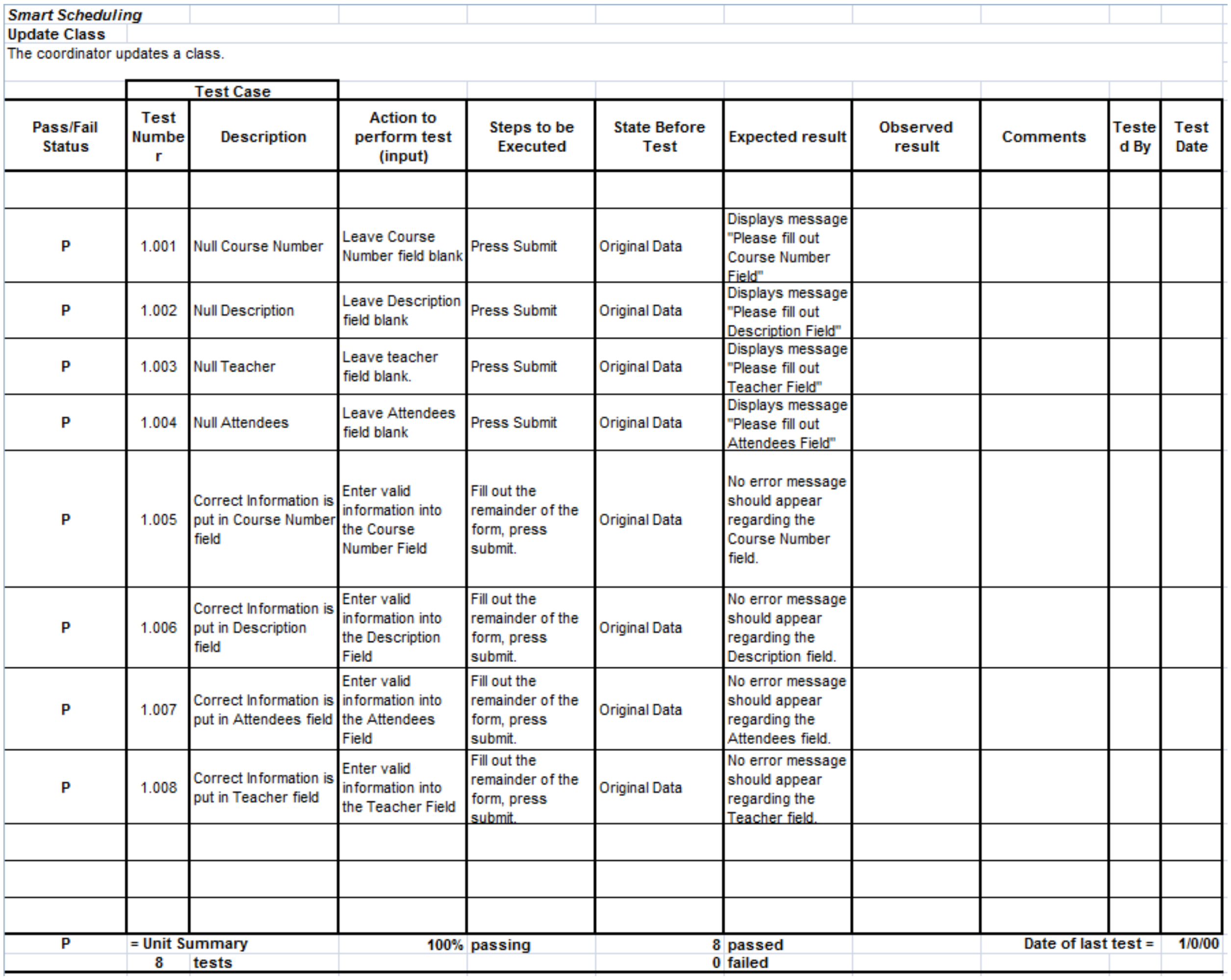
Smart Scheduling

Authenticat

Allows users to log on using their accounts.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
P	1.001	Null Username Field	Leave username field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out username Field"				
p	1.002	Null Password Field	Leave password field blank.	Fill out remainder of form. Press submit.	Empty Form.	Displays message "Please fill out Password Field"				
P	1.003	Incorrect Password for given username.	Input incorrect Username and password combination.	Press submit.	Empty Form.	Displays message: "Username and Password combination do not match our				
P	1.004	Non-existing username.	Input a username which does not exist.	Fill out remainder of form. Press submit.	Empty Form.	Displays message: "Username and Password combination do not match our				
P	1.005	Link to Reset password.	Click on link.	Click on the "Reset password" link.	Empty Form.	Should redirect to reset password screen.				
P	1.006	Link to About Smart Scheduling.	Click on link.	Click on the "About Smart Scheduling" link.	Empty Form.	Should redirect to about Smart Scheduling				
P	1.007	Correct Information is put in Username field	Enter valid information into the Username Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Username field. Redirected to home page.				
P	1.008	Correct Information is put in Password field	Enter valid information into the Password Field	Fill out the remainder of the form, press submit.	Empty Form.	No error message should appear regarding the Password field. Redirected to home page.				
P	**= Unit Summary**		**100%**	**passing**	**8**	**passed**		**Date of last test =**		**1/0/00**
	8	**tests**			**0**	**failed**				

2.6.3.4 Update Class



Smart Scheduling

Update Class

The coordinator updates a class.

	Test Case									
Pass/Fail Status	**Test Number**	**Description**	**Action to perform test (input)**	**Steps to be Executed**	**State Before Test**	**Expected result**	**Observed result**	**Comments**	**Tested By**	**Test Date**
P	1.001	Null Course Number	Leave Course Number field blank	Press Submit	Original Data	Displays message "Please fill out Course Number Field"				
P	1.002	Null Description	Leave Description field blank	Press Submit	Original Data	Displays message "Please fill out Description Field"				
P	1.003	Null Teacher	Leave teacher field blank.	Press Submit	Original Data	Displays message "Please fill out Teacher Field"				
P	1.004	Null Attendees	Leave Attendees field blank	Press Submit	Original Data	Displays message "Please fill out Attendees Field"				
P	1.005	Correct Information is put in Course Number field	Enter valid information into the Course Number Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Course Number field.				
P	1.006	Correct Information is put in Description field	Enter valid information into the Description Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Description field.				
P	1.007	Correct Information is put in Attendees field	Enter valid information into the Attendees Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Attendees field.				
P	1.008	Correct Information is put in Teacher field	Enter valid information into the Teacher Field	Fill out the remainder of the form, press submit.	Original Data	No error message should appear regarding the Teacher field.				
P	**= Unit Summary**		**100%**	**passing**	**8**	**passed**		**Date of last test =**		**1/0/00**
	8	**tests**			**0**	**failed**				

2.7 Development Environment and Production Environment

For our development environment, Empire Unlimited will be using the Windows and Macintosh computers provided by Siena College located on the 3rd floor of Roger Bacon in the Software Engineering lab. The reason for detailing the development and production environments is to try and complete a high level of compatibility across as many platforms as possible. If an error in compatibility arises, this listing will act as a reference to help narrow down potential version conflicts.

Server

Web Server: Apache version 2.2.9
Programming Language: PHP version 5.2.6
Database: MySQL 5.0.45

Windows Machine:

- Operating System: Microsoft Windows Vista Enterprise (32 bit)
    - ❖ Service Pack 2
- Hardware
    - ❖ Processor: Intel Core 2 Duo, 2.93 GHz
    - ❖ Memory: 4.00 GB RAM
- Software Installed:
    - ❖ Microsoft Office 2007
    - ❖ Macromedia Dreamweaver : Version 7.0.1
    - ❖ Macromedia Fireworks : Version 7.0.2.295
    - ❖ Internet Explorer : Version 9.0.7930.16406
    - ❖ Mozilla Firefox : Version 3.6.12
    - ❖ Google Chrome : Version 7.0.517.44

Macintosh Machine:

- Operating System: Apple Mac OS X
    - Version 10.6.4
- Model: iMac5
- Processor: Intel Core2 Duo
    - Speed: 2 GHz
- Memory (RAM): 1.00 GB

Appendices

The information presented in this document was gathered through meetings held with the client, Dr. Robert Yoder. Information was also taken from class lectures held with Dr. Lederman and from documents written by past Software Engineering groups.

Appendix A: Glossary of Terms

Ajax (**Asynchronous JavaScript and XML)** - A group of web development techniques used on the client-side to create interactive web applications.

Apache HTTP Server (Web Server) - Referred to as Apache, it is web server software notable for playing a key role in the initial growth of the World Wide Web.

Cascading Style Sheets (**CSS**) - A style sheet language used to describe the presentation semantics (the look and formatting) of a document written in a markup language.

Chrome – Internet browser designed by Google.

Conflict and Constraint – When an activity can't be scheduled due to room use, weekend, and one resource being currently in use.

Database - An organized collection of data for one or more uses, typically in digital form.

Dreamweaver – A web development application.

Dropbox - A Web-based file hosting service operated by Dropbox, Inc. which uses cloud computing to enable users to store and share files and folders with others across the Internet using file synchronization.

Firefox – Internet browser designed by Mozilla.

Gantt Chart - A type of bar chart that illustrates a project schedule. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project.

HTML (HyperText Markup Language) - The predominant markup language for web pages. It is written in the form of HTML elements consisting of "tags" surrounded by angle brackets within the web page content. It is the building blocks of all basic websites.

Internet - A global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide. It is a *network of networks* that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic and optical networking technologies.

Internet Explorer (IE) – Internet browser designed by Microsoft.

JavaScript - An implementation of the ECMAScript language standard and is typically used to enable programmatic access to computational objects within a host environment.

MySQL - A relational database management system that runs as a server providing multi-user access to a number of databases.

PHP (Hypertext Preprocessor) - A widely used, general-purpose scripting language that was originally designed for web development to produce dynamic web pages.

Ruby - A dynamic, reflective, general purpose object-oriented programming language that combines syntax inspired by Perl with Smalltalk-like features.

Room Report – Schedule of times when a room, lab, or the Computer Science Library is booked, by a class or group, on a given day of the week.

Spiral Model - A software development process combining which elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts.

Waterfall Model (Classic) - The Classic Waterfall Model is a sequential software development model in which development is seen as flowing steadily downwards (similar to a waterfall) through the phases of requirements analysis, design, implementation, testing, integration, and maintenance.

WinZip - A proprietary file archiver and compressor for Microsoft Windows,

XHTML (eXtensible Hypertext Markup Language) - A family of XML markup languages that mirror or extend versions of the widely used Hypertext Markup Language (HTML), the language in which web pages are written.

XML (Extensible Markup Language) - A set of rules for encoding documents in machine-readable form.

Appendix B: Project Timeline: Gantt Chart

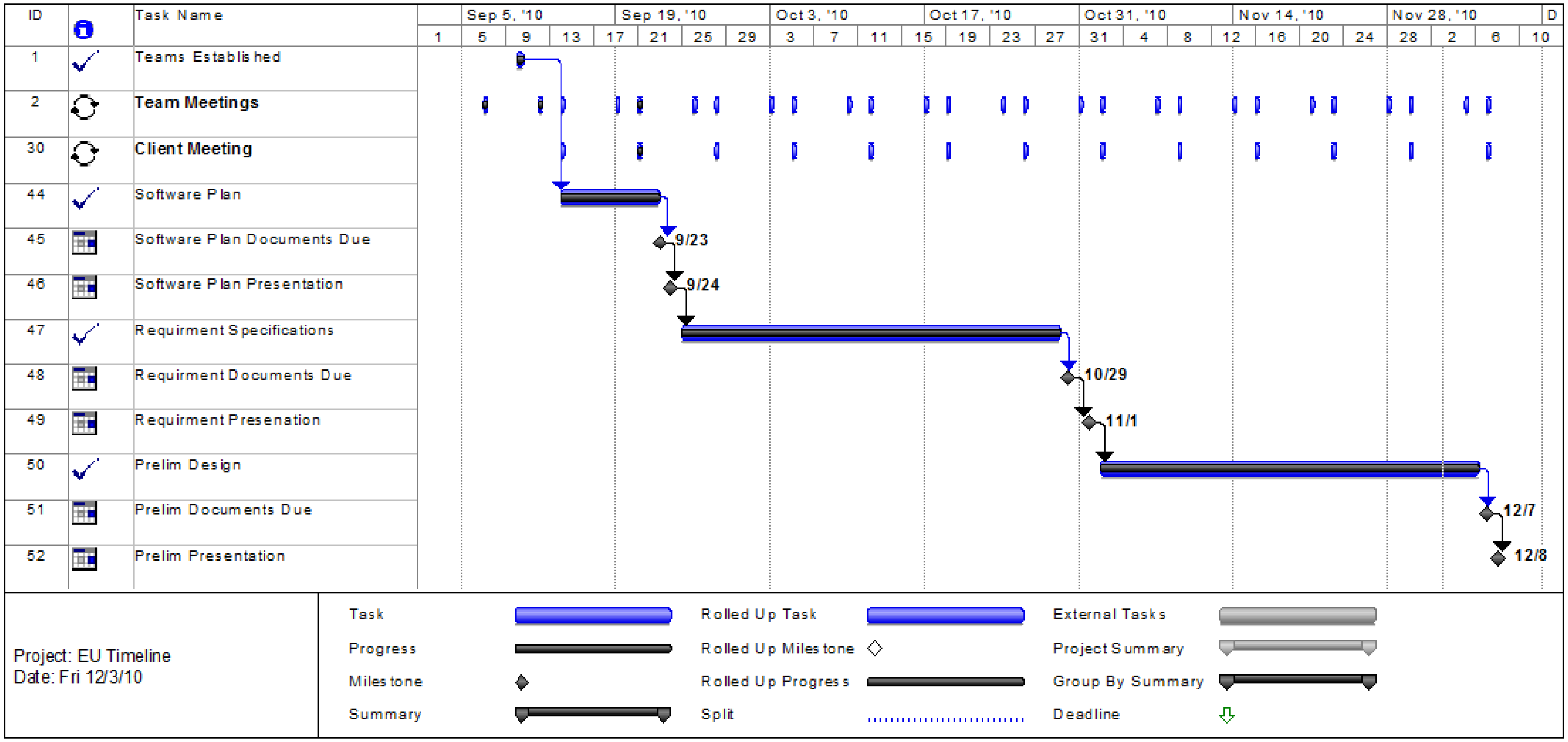
Current Timeline

First the Current Timeline for this project will be displayed

Future Timeline

Second will be the Future Timeline for the completion of the project

Timeline - Gantt Chart

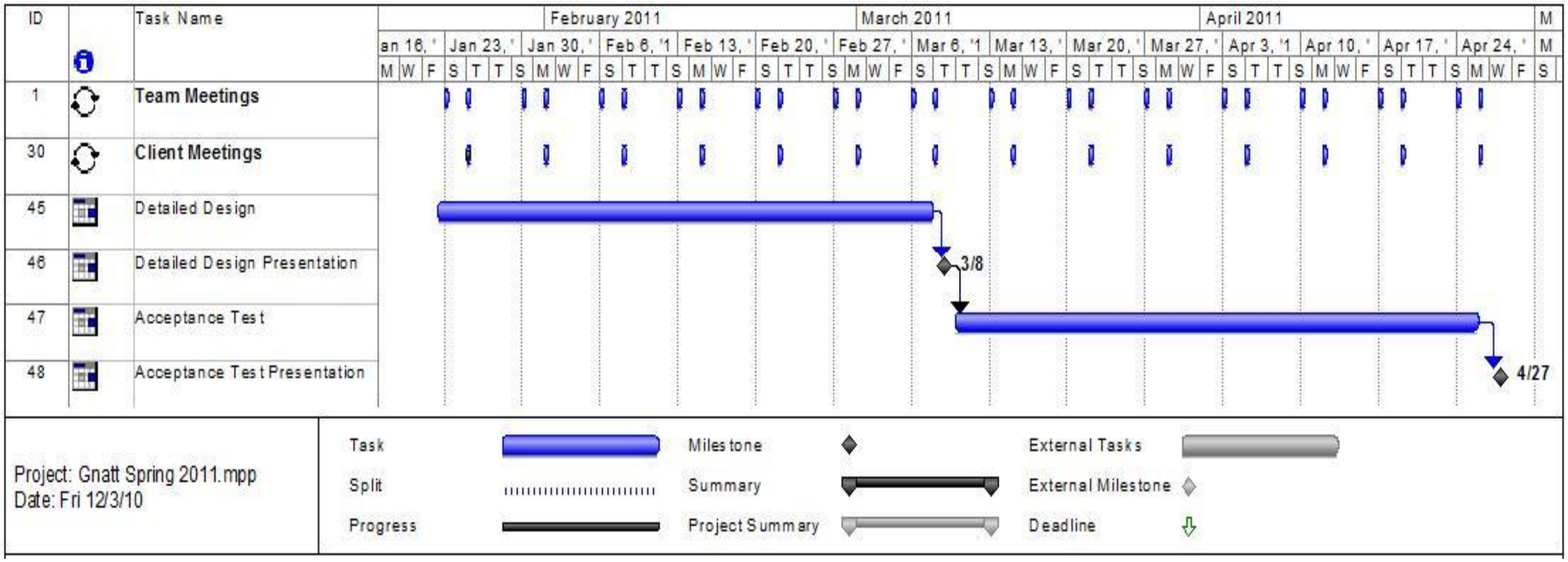


ID		Task Name
1	✓	Teams Established
2		Team Meetings
30		Client Meeting
44	✓	Software Plan
45		Software Plan Documents Due
46		Software Plan Presentation
47	✓	Requirment Specifications
48		Requirment Documents Due
49		Requirment Presenation
50	✓	Prelim Design
51		Prelim Documents Due
52		Prelim Presentation

Project: EU Timeline
Date: Fri 12/3/10

The Gantt Chart displays our timeline for the semester, showing team meetings, client meetings and milestones.

Timeline - Gantt Chart



The Gantt Chart displays our timeline for the semester, showing team meetings, client meetings and milestones.