Scheduling System for Math Department Resources

Matthew Mooney

Brandon Rozzi

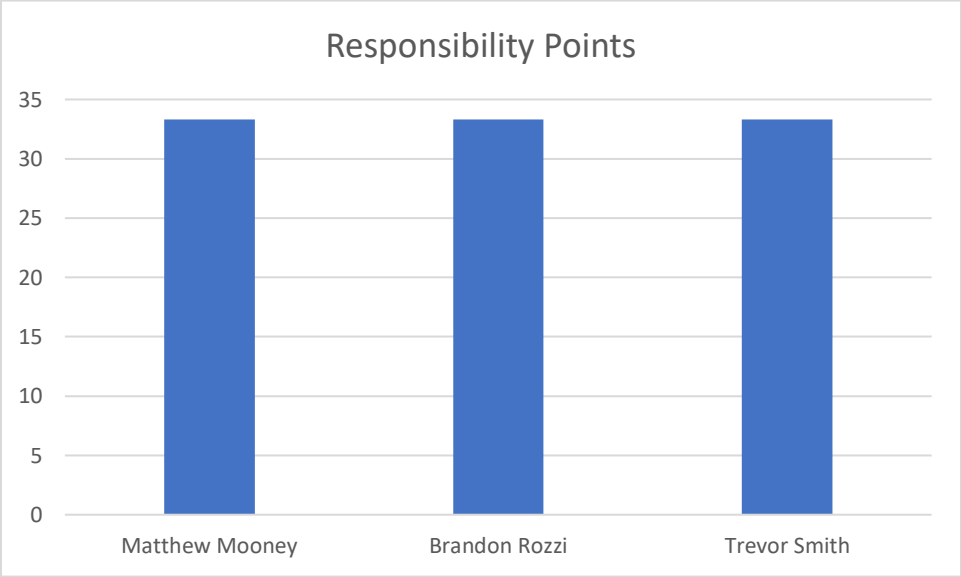
Trevor Smith

Individual Contribution Breakdown

Table 1: Responsibility Matrix

Allocation by Team Member		Team Member Name		
		Matthew Mooney	Brandon Rozzi	Trevor Smith
Responsibility levels	Project Management (*10 points*)	33%	33%	33%
	Sec.1: Customer Statement of Requirements (*9 points*)	33%	33%	33%
	Sec.2: System Requirements (*6 points*)	33%	33%	33%
	Sec.3: Functional Requirements Specification (*30 points*)	33%	33%	33%
	Sec.4: User Interface Specs (*15 points*)	33%	33%	33%
	Sec.5: Domain Analysis (*25points*)	33%	33%	33%
	Sec.6: Plan of Work (*5 points*)	33%	33%	33%

Graph 1: Responsibility Chart



Contents

Functional Requirements Specification

Stakeholders

The stakeholders for the system are the students who will use the system, the Math department of YSU who will act as the administrators of the system, and the Computer Science department of YSU which was tasked with its creation. Trevor, Matt, and Brandon are also stakeholders since they are acting as developers of the system.

Room Reservation Actors and Goals

Actor	Type	Goal	Description
User	Initiating	To request a room reservation.	A general user that must have a request accepted to reserve a room.
PowerUser (Faculty)	Initiating	To reserve a room.	Math department faculty who can reserve a room without permission.
Administrator	Initiating	To accept or deny room requests as well as decide when rooms are unavailable.	User who can directly change room availability as well as handle room reservation requests.
Room Database	Participating		Stores information about rooms and their availability

Tutor System Actors and Goals

Actor	Type	Goal	Description
Administrator	Initiating	View tutor availability and suggested schedule.	The user in charge of the MAC scheduling.

Tutor Database	Participating		Stores tutor information and availability.

Use Case Descriptions

Room Scheduling

A registered user logs into the system and is taken to view availability (REQ-1). The user then has the option to schedule a room reservation (REQ-2) and manage their existing reservations (REQ-5). A reservation can be placed reoccurring on a given time slot (REQ-2). If the user is not a Math Department faculty member, the request will be sent to the administrator for approval (REQ-3). If no approval is required or the request is approved, the room is then scheduled.

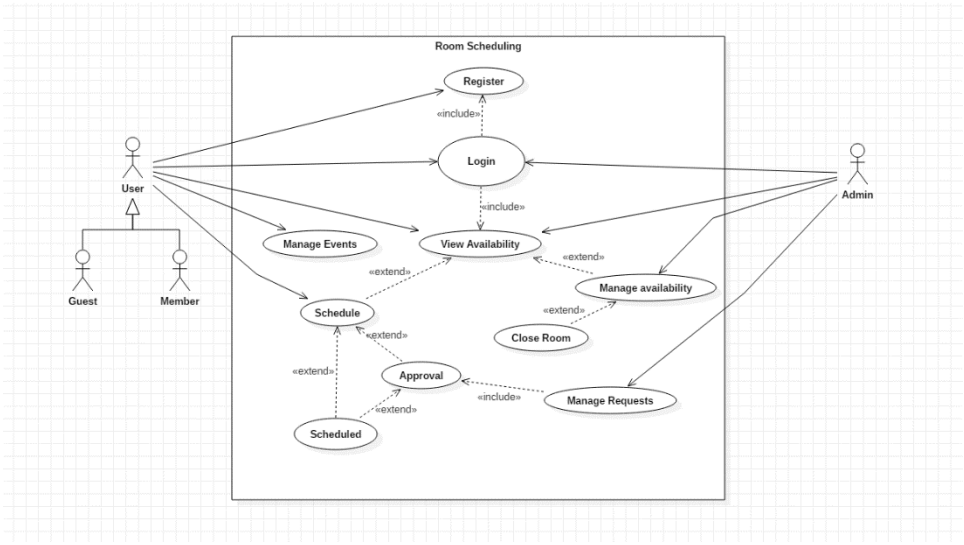


Figure 1: Room Scheduling Use Case Diagram

Approval

The administrator logs into the system and can choose between viewing available room reservation requests and available faculty user access requests. When viewing the pending room requests the administrator will be able to view each requests information and either approve or deny the request (REQ-3). When viewing the faculty user requests the administrator will be

given the requestee's information and can then either approve or deny them accordingly. (REQ-10).

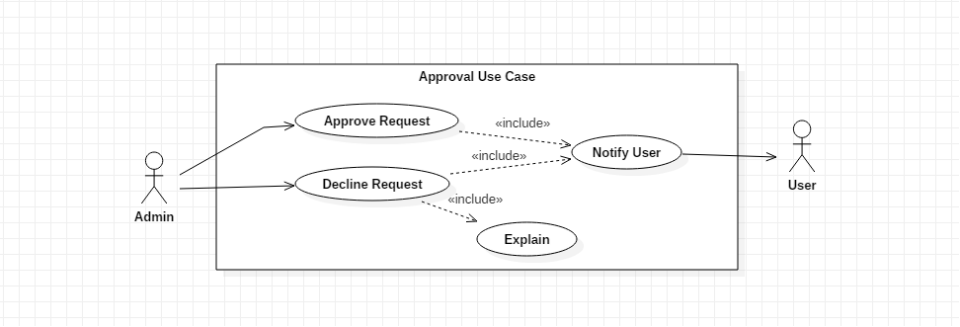


Figure 2: Approval Use Case Diagram

Room Unavailability

When the administrator logs into the system, they will have to option to make a room unavailable for reservation (REQ-4). If the room is already scheduled, but needs to be closed for some reason, the admin will be able to send an email alerting the owner of the reservation of the cancelation.

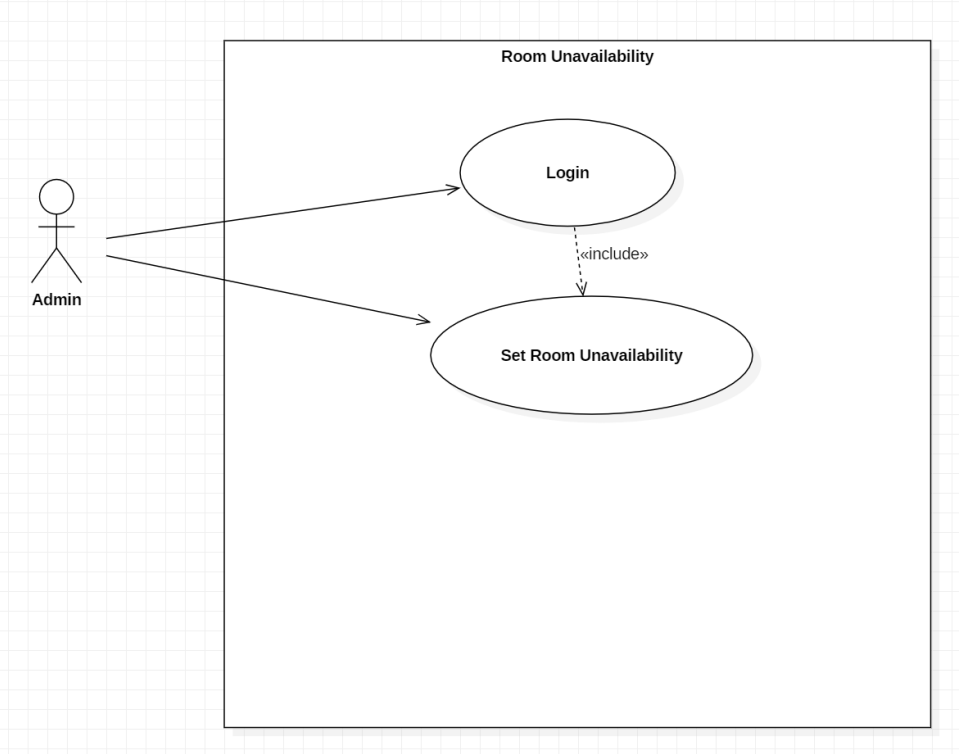


Figure 3: Room Unavailability Use Case Diagram

View Room Analytics

The scheduling system admin logs in to the system. The admin has the option to view analytic data regarding room utilization (REQ-6)

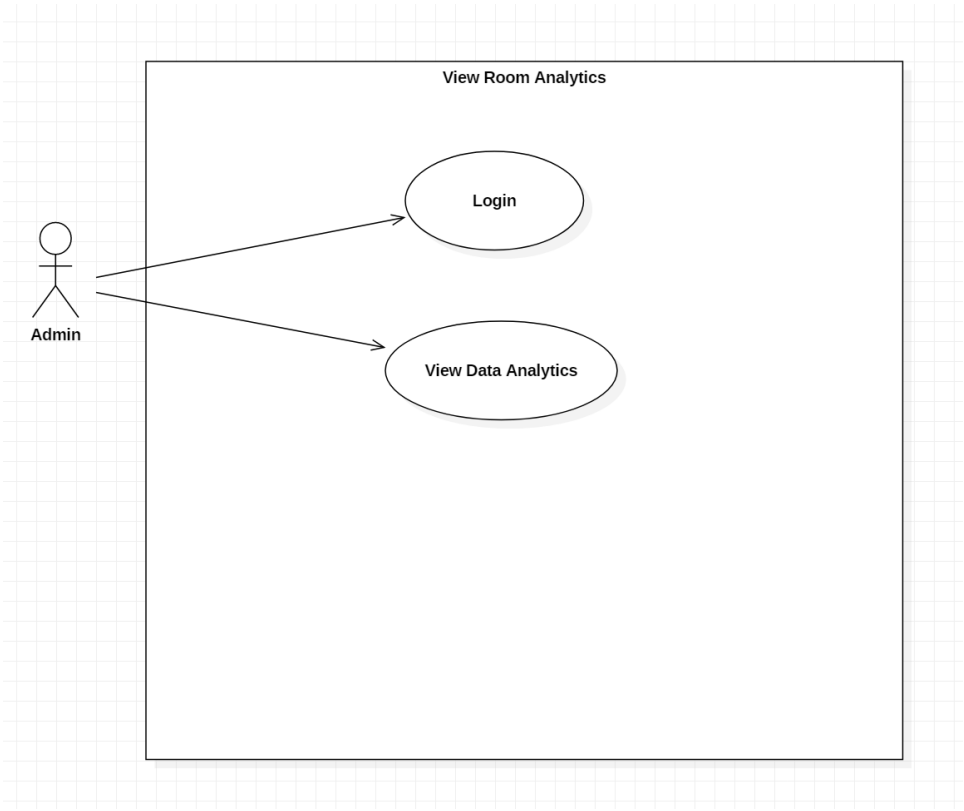


Figure 4: View Room Analytics Use Case Diagram

Updating Tutors

The Administrator will have a page to view a list of the tutors that are on staff at the MAC (REQ-8). The page will have to name of each tutor alongside with the classes they can tutor and their availability. The administrator will be able to click an edit button by each of the tutors to be able to delete or change the availability of a tutor. Administrator will also be able to add a new tutor to the list.

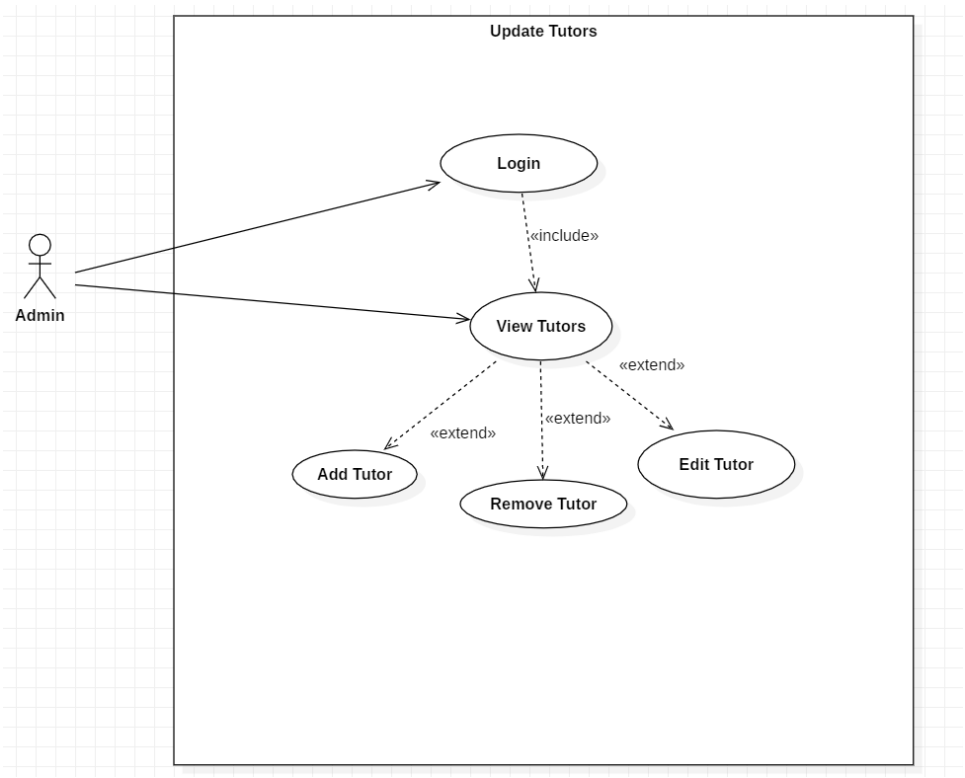


Figure 5: Update Tutors Use Case Diagram

Obtain Suggested Schedule

The MAC admin logs in to the system. The admin then has the option to view a suggested schedule generated by the system (REQ-8).

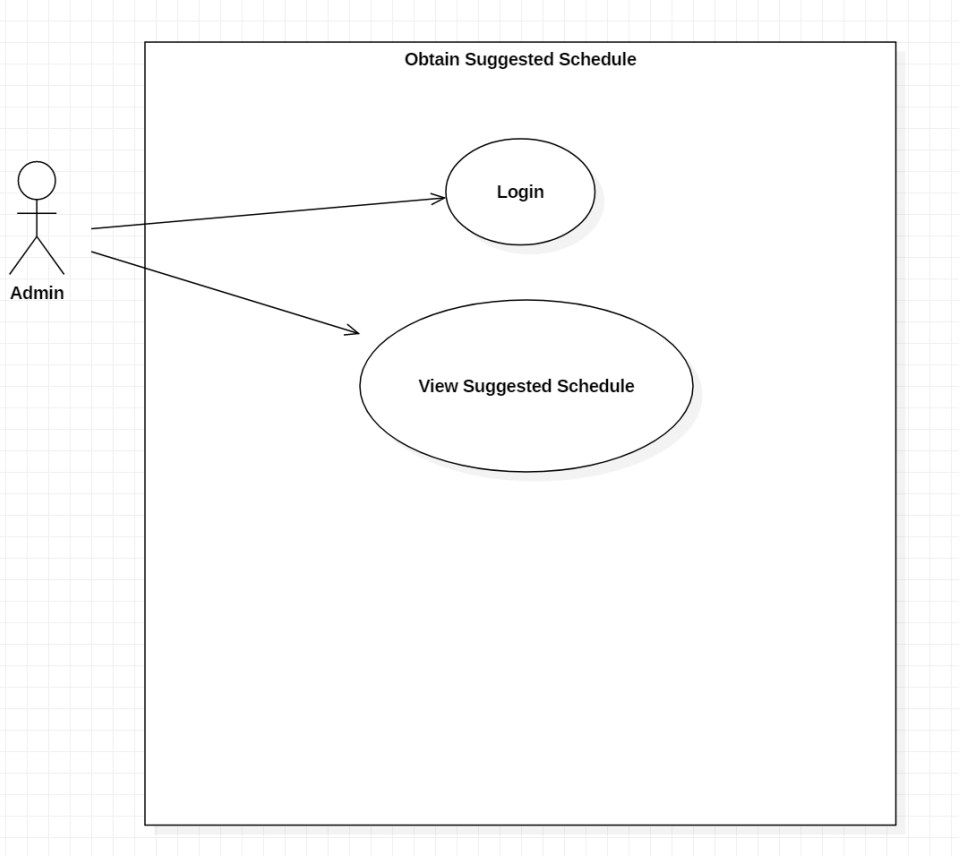


Figure 6: Obtain Suggested Schedule Use Case Diagram

Traceability Matrix

Use Case	Priority	REQs Met
Scheduling a Room	1	1, 2, 3, 5
Approval	2	3, 9
Viewing Tutors	3	7
Room Unavailability	4	4
Obtaining a Suggested Schedule	5	8
Viewing Room Analytics	6	6

Detailed Use Case Description

Use Case: Scheduling a Room

Primary Actors: User

Participating Actors: Admin

Stakeholders and Interests:

- User wants to schedule a room for an event and receive confirmation that the room was scheduled. The process should be convenient and simple.
- The admin wants faculty to be able to schedule a room without approval while non-department faculty must receive approval

Preconditions:

- User successfully authenticates into system

Successful Operation:

1. The user views available rooms and time blocks
2. User selects the time block for the room that they desire
3. User completes a form with information regarding their event. This form details reoccurrence, start and end date of reoccurrence, and a description of the event.
4. The system returns confirmation that the reservation was placed.
5. Non-department faculty continue the use case for approval. The reservation is scheduled and the use case ends.
6. The admin approves the request
7. The user receives confirmation that the reservation has been scheduled and use case ends.

Exception Cases:

- A user completes the reservation form for a room that is already reserved. Reservation is not scheduled.

- The admin declines the reservation request. User receives notification of the decline with a brief reason. The reservation is not scheduled.

Postconditions:

- User has confirmation that their meeting was scheduled

Use Case: Approval

Primary Actors: Admin

Participating Actors: User

Stakeholders and Interests:

- Admin wants to be able to view all pending requests, quickly view details about the requests and easily approve or decline the requests.
- User wants to request a room reservation or department faculty account status and receive notifications regarding whether their requests have been approved or declined

Preconditions:

- Admin successfully authenticates into the scheduling system

Successful Operation:

1. The admin views the pending requests
2. Admin selects a pending request and reviews the request details
3. Admin approves the request
4. User receives a notification that the request was approved and use case ends.

Exception Scenarios:

- Admin declines a pending request. Admin provides a reason for the decline and the user receives a notification containing notice of decline and the reason provided.

Postconditions:

- Room is scheduled, or account rights are increased to faculty status

Use Case: Updating Tutors

Primary Actors: MAC Coordinator

Stakeholders and Interests:

- The MAC Coordinator wants to be able to view tutor availability and easily modify or add tutors to reflect changes in availability

Preconditions:

- The MAC Coordinator successfully authenticates into the tutor availability system

Successful Operation:

1. MAC Coordinator views a list of tutors and their availability
2. MAC Coordinator selects add to add a new tutor or selects a tutor to edit. If the option to delete a tutor is chosen, the use case ends.
3. A form is presented containing the availability of the tutor which the MAC Coordinator populates with the tutor information. When editing a tutor this form is prepopulated with the existing information which can be changed.
4. The MAC Coordinator submits the form
5. The use case ends

Exception Scenarios:

- A tutor is added that already exists, existing tutor is updated.

Sequence Diagrams

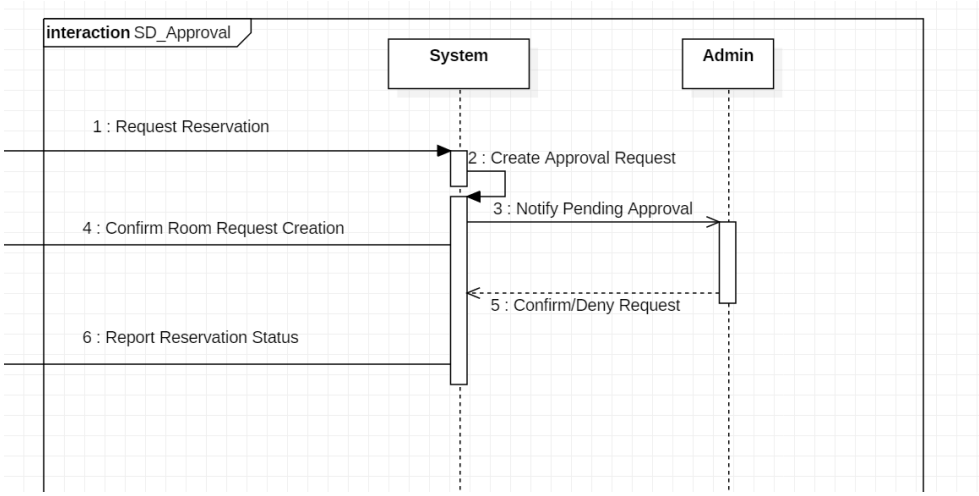


Figure 7: Approval Sequence Diagram

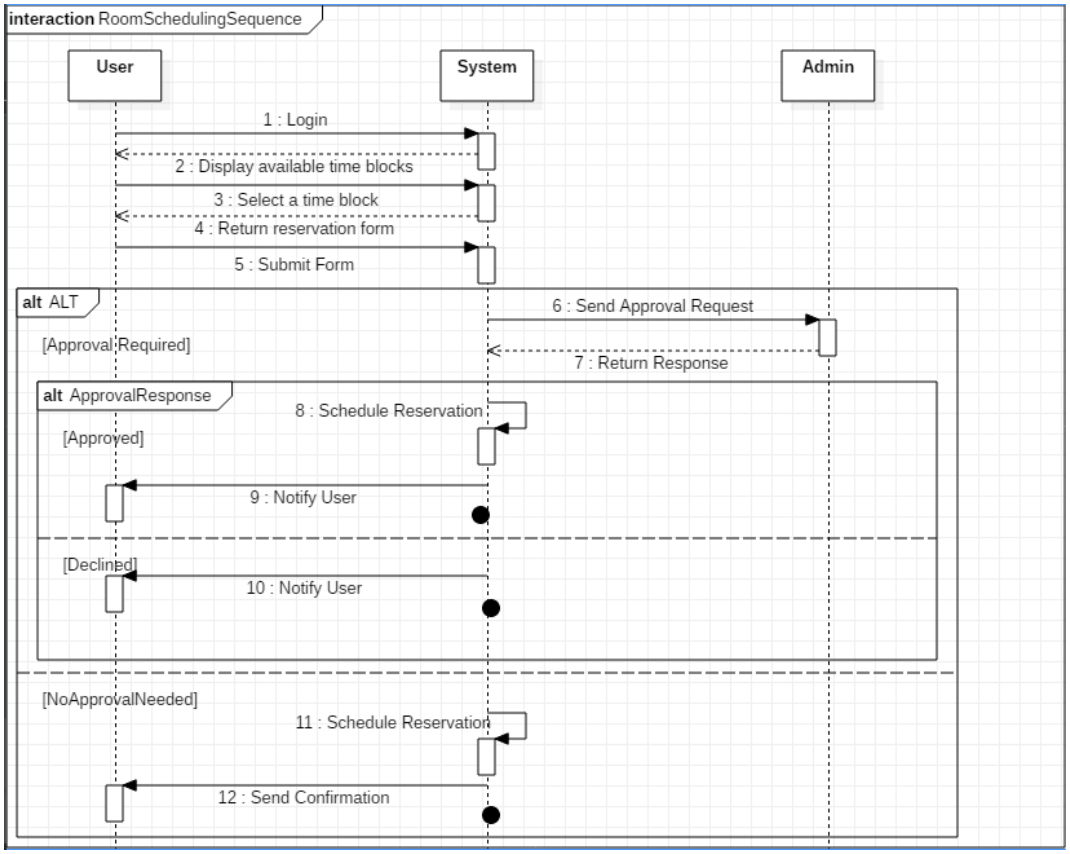


Figure 8: Room Scheduling Sequence

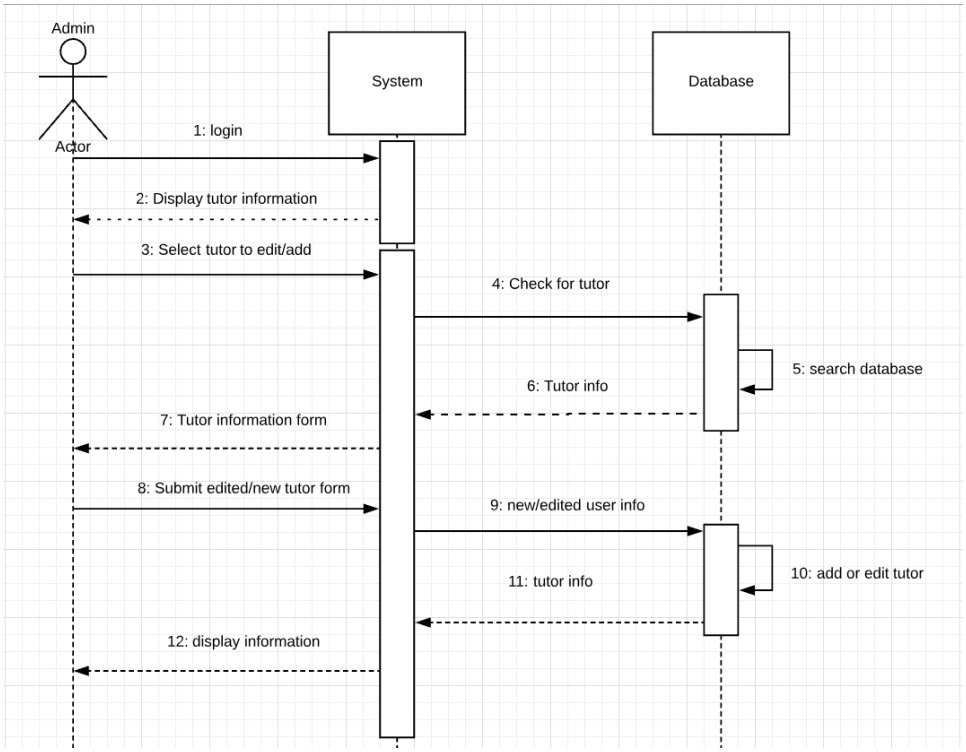


Figure 9: Adding/Editing tutors

User Interface Specification

Room Scheduling

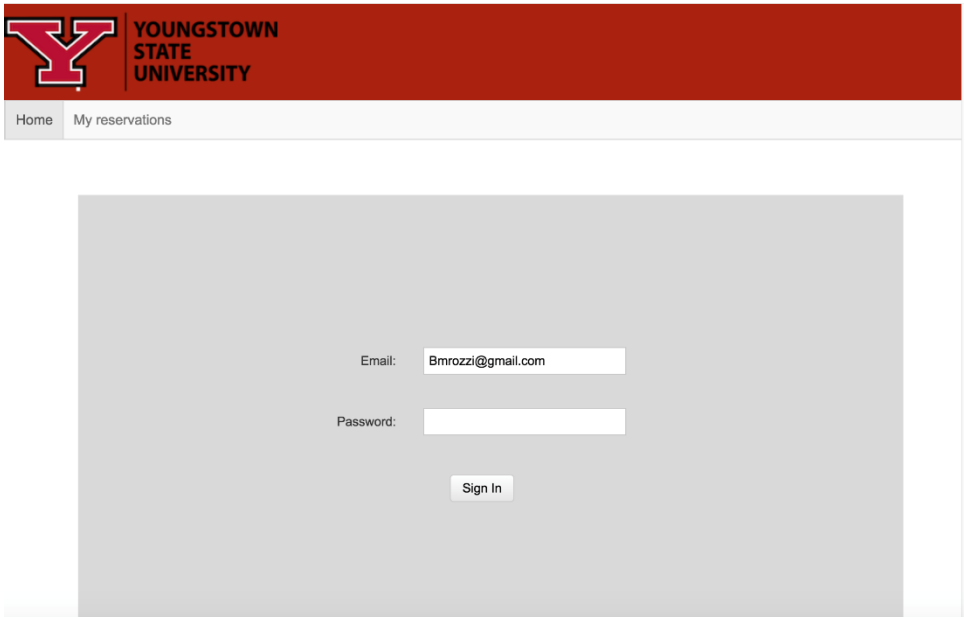


Figure 10: log in

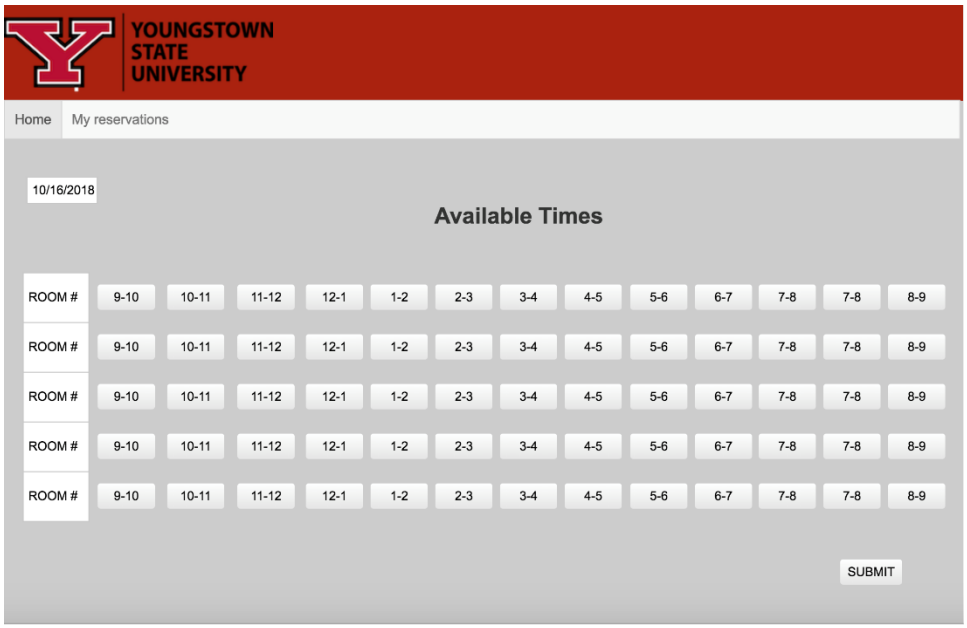


Figure 11: Choosing a room.

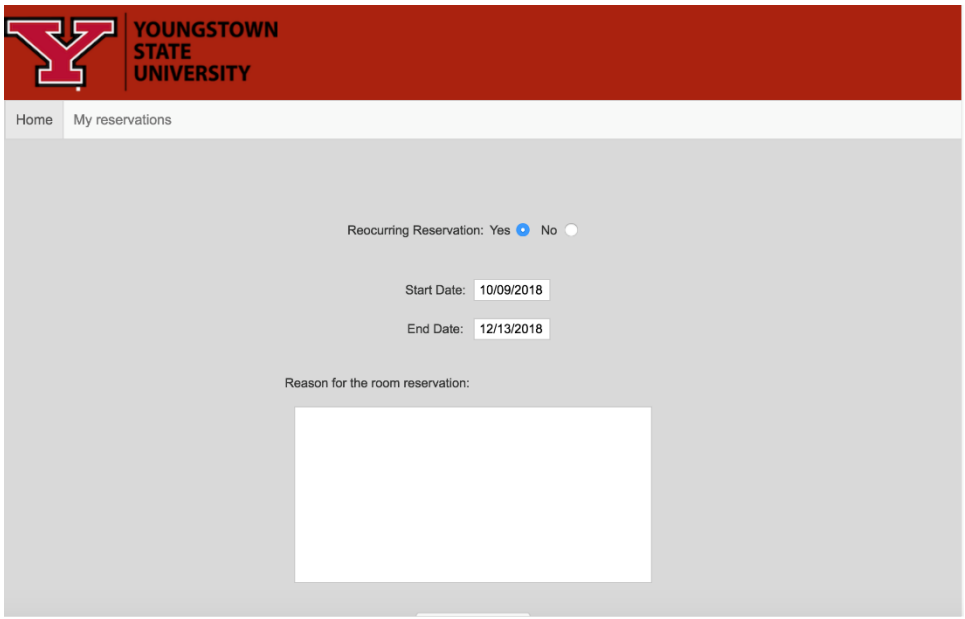


Figure 12: Submitting a room request.

Once a user logs into the system (**Figure 10**) they will be taken to the home page. The home page is where the room availability will be shown as seen in **Figure 11**. The user will then go to the top left of the page below the navigational bar and enter a date to view the room

availability. Once this is done, a list of the room numbers and the times available for those rooms will be shown. The user will then click a time slot that they want and hit submit. If the user is facility of the math department then the reservation will be automatically be accepted and scheduled. However, if the user is anyone else the request will have to submitted to an administrator for approval. If this is the case, the user will be taken to the page shown in **Figure 12.** The user will then have to fill out basic information about their room reservation. Which includes if the reservation is recurring and the reason for the reservation. Once these fields are completed the user will hit submit and the request will be sent to an administrator.

User-Effort Estimation

The login page will require Three clicks. To select a room the user must select a date, the time slots they want, and hit the submit button which is all together at least three clicks. Then when filling out the reservation information the user will have to select if it is a reoccurring reservation, dates of reoccurring reservation, reason for reservation, and the submit button. This is a total of five clicks. If the user has a non-reoccurring reservation this process can require as few as eight clicks, if it is a reoccurring reservation then it will take a minimum of eleven clicks. The number of keystrokes for this use case of the system is small because only basic user input is required.

Administrator Approval

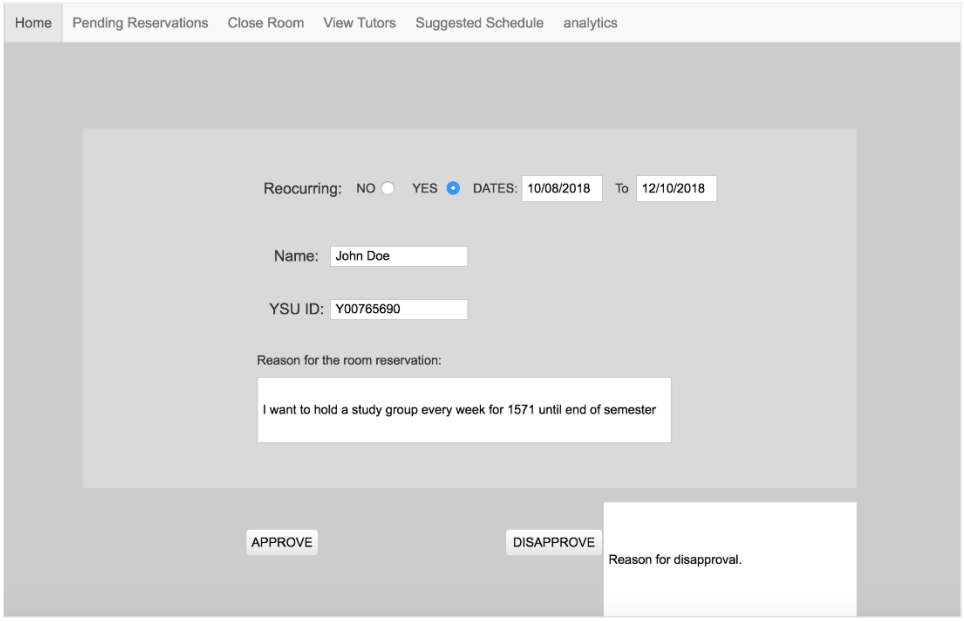


Figure 13: administrator approval

Once a request is submitted the administrator will be able to view all the pending room requests shown in **Figure 13**. The requests will show the date of the room reservation and if it is recurring or not. Then below the date information, will be the students full name and YSU id number. Below that will be the reason the student wants to reserve the room. The administrator will be able to look over all the information and choose whether the reservation can be approved. If the reservation can be approved, then the administrator can click the approved button and the reservation is booked. However, if it cannot be approved then the administrator will type a brief description of the reason why the request got declined. Then hit the disapprove button and the student will be notified by email of the reason for disapproval of the room reservation.

User-Effort Estimation

The admin will have to log into the system which only take about three clicks. Then from the home page must select the pending reservations tab. From there either must click of approve or disapprove. If the reservation is not approved, then the admin must type in why it was not

approved. This task can take as little as 5 click to be completed and only a small number of keystrokes.

Viewing Tutors

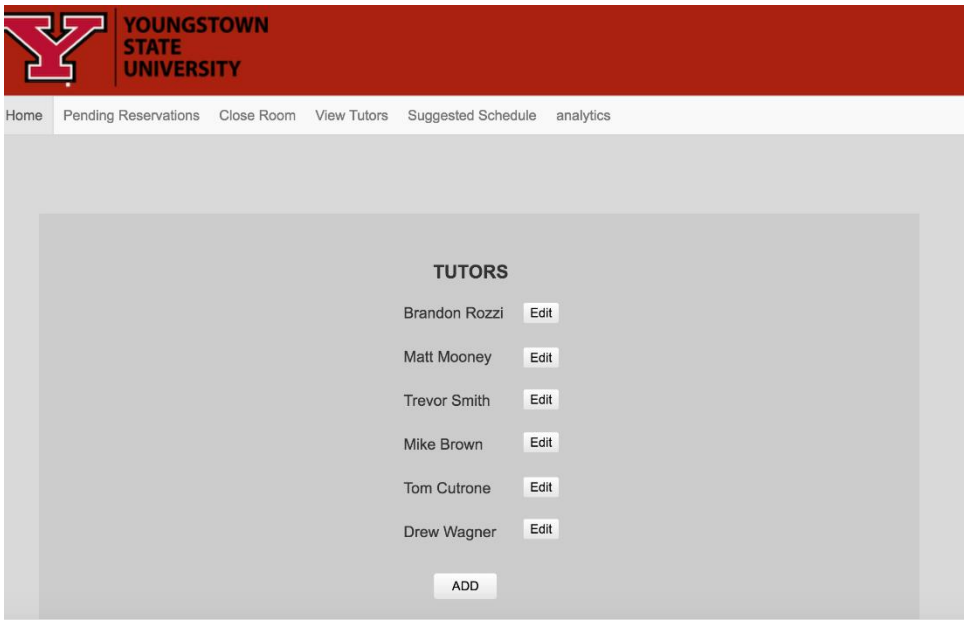


Figure 14: viewing tutors

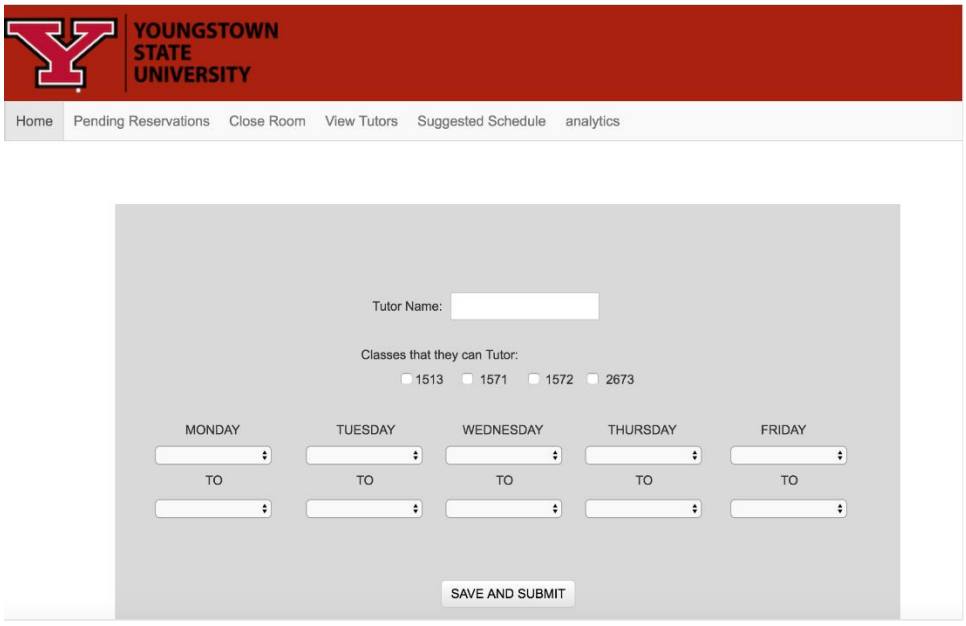


Figure 15: editing and added a new tutor

When the administrator is logged in, at the top of the page there is a tab for the admin to view the list of tutors on staff at the MAC. This page shown in **Figure 14** will list the current roster of tutors. Along each of the tutor's names is a button for the admin to be able to edit the tutor's information. Also, at the bottom of the page there is an add button that will allow the admin to add a new tutor to the roster. When the admin clicks on the edit button, they are taken to the page shown in **Figure 15.** The admin can then change any of the information such as name of tutor, classes they can tutor, and the tutor's availability. When the admin presses the add button, they are taken to the same page shown in **Figure 15.** Except this time all the fields are empty, and the admin will enter all the tutor's information fields. Once all the fields are filled out then the admin will hit the save and submit button and the tutor will be added to the list.

User-Effort Estimation

The admin will have to click on the *view tutors* tab in the menu bar. Then they must click the add button to add a tutor to the list. From there they must fill in the input fields about the tutor. Depending on how many classes the tutor can teach and their availability the amount of clicks this task takes to complete can be as low as fourteen.

Room Unavailability

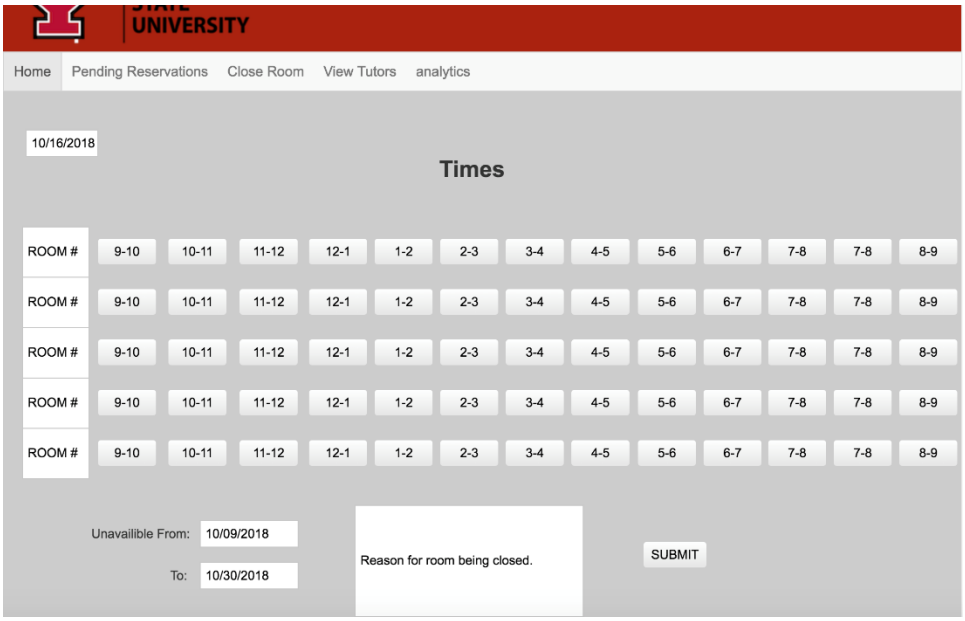


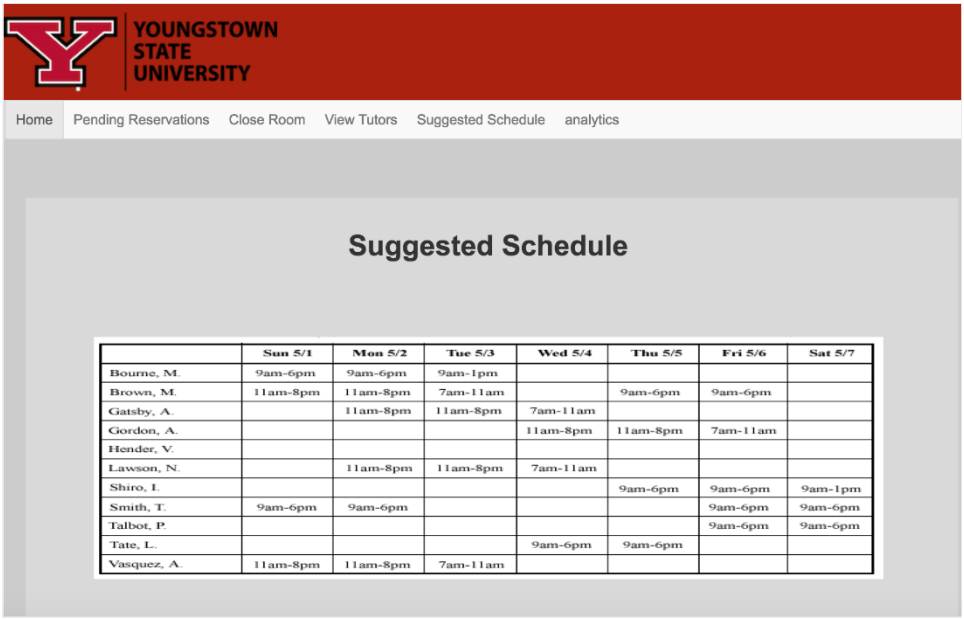
Figure 16: Closing a room

If a room is under maintenance, being used for a class, or the building is closed for a holiday then the admin needs to be able to block off that room from being able to be reserved. To do this the admin will go to the menu bar at the top of the page and click on the *close room* tab. The admin will be taken to the page shown in **Figure 16.** At the top of the page there is a field to put the date to bring up all the times for a given room. The admin can then choose one-time slot to make the room unavailable for only one day, specific hour, or can choose a room and make it closed for an extended period. The admin will pick a room and time and then if the room needs to be closed for more than just one day, they will fill out the field in the bottom left corner. This field allows the admin to enter a start date and end date for a room being closed. Once this is done the admin will fill out a reason for the room being closed and then click submit. Once the admin clicks submit the room becomes closed and is no longer able to be reserved. The system will also send out an email to any owner of a reservation where the room is no longer available to inform them.

User-Effort Estimation

The admin will have to click on the close room tab in the menu bar at the top of the page. Then select a date to view rooms and select the times the room will be closed. They can also choose to close a room for multiple days which means they would have to select the dates for the closure. After selecting the dates, the admin will add a brief description of why the room is closed and click submit this will keep the number of keystrokes to a small number. The number clicks will be different depending on how many time slots need to be selected. Assuming only one-time slot needs to be selected this use case can be done in seven clicks.

Suggested Schedule



	Sun 5/1	Mon 5/2	Tue 5/3	Wed 5/4	Thu 5/5	Fri 5/6	Sat 5/7
Bourne, M.	9am-6pm	9am-6pm	9am-1pm				
Brown, M.	11am-8pm	11am-8pm	7am-11am		9am-6pm	9am-6pm	
Gatsby, A.		11am-8pm	11am-8pm	7am-11am			
Gordon, A.				11am-8pm	11am-8pm	7am-11am	
Hender, V.							
Lawson, N.		11am-8pm	11am-8pm	7am-11am			
Shiro, I.					9am-6pm	9am-6pm	9am-1pm
Smith, T.	9am-6pm	9am-6pm				9am-6pm	9am-6pm
Talbot, P.						9am-6pm	9am-6pm
Tate, L.				9am-6pm	9am-6pm		
Vasquez, A.	11am-8pm	11am-8pm	7am-11am				

Figure 17: suggested schedule

An admin can also view a suggested schedule that the system provides from the information about the tutors. The admin will go to the menu bar at the top of the page and select on the *suggested schedule* tab. This will then take them to the page shown in **Figure 17** where they can view the suggested schedule.

User-Effort Estimation

This use case will take only one click from when the admin is signed in. The user must click on the view schedule tab in the menu bar. For this use case no keystrokes are required or needed.

Viewing Analytics

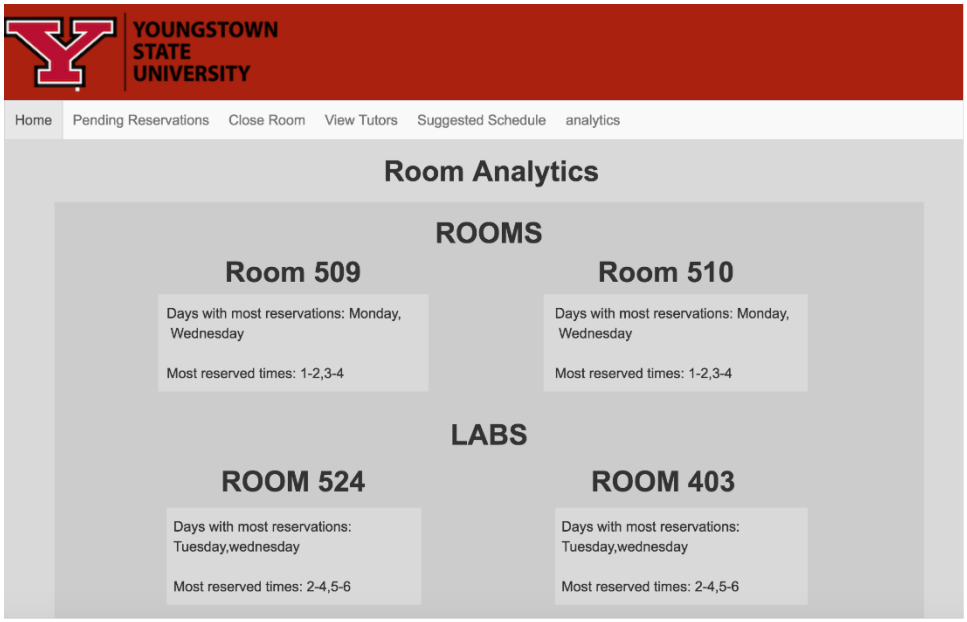


Figure 18: analytics

The admin will be able to go menu bar at the top and select on the *analytics tab.* This will then take the admin to the page shown in **Figure 18**. From this page they will be able to view what days each room gets reserved the most. Also, will be able to see at what times are the busy times for reservations. With the data from this page the admin will be able to see if they need to open additional amount of rooms at a given time.

User-Effort Estimation

This use case will take only one click from when the admin is signed in. The user must click on the analytics tab in the menu bar. For this use case no keystrokes are required or needed.

Plan of Work

As of today, we have all split the work of the schedule system evenly as seen in *table 1: Responsibility Matrix*. The scheduling system has a total of nine functional requirements that can be split up evenly amongst the group. Trevor will be handling REQ-6, REQ-7, and REQ-9 all of which will deal with the analytics of the scheduling system. Brandon will be handling the requirements that deal with the user's viewing of the scheduling system. These include the requirements REQ-1, REQ-5, and REQ-8. Matt will be handling the requirements of room availability and requests. These Include REQ-2, REQ-3, and REQ-4. Our immediate plans are to figure out the web hosting. After that is squared away, we will work on our databases for the system that are needed. Our short-term goal is to get all of this done by the 19th of October as seen in *figure 3*. Staying on track with this time line we will have a functioning prototype to present to our client by the end of October. This will give us more than enough time to be able to address any unseen problems before the completed project deadline. After the prototype, we will finish up the second report and that will lead us into the first demo we can present. After the first demo we will begin to implement any nonfunctional requirements that need to be added. Then be able start combining report one and two for the final report for the system. Once all this is completed, we will focus on and finish the final version of the scheduling system.

Math Scheduling System			DURATION (days)
START DATE	END DATE	DESCRIPTION	
10/5/18	10/9/18	Figure out Web Hosting	4
10/5/18	10/19/18	Databases Complete	14
10/5/18	10/31/18	Complete Prototype	26
10/16/18	11/8/18	Full Report #2	22
10/5/18	11/12/18	Finish Demo #1	37
11/8/18	12/4/18	Full Report #3	26
10/5/18	11/12/18	Finish Demo #1	37
11/30/18	12/7/18	Complete Project	7

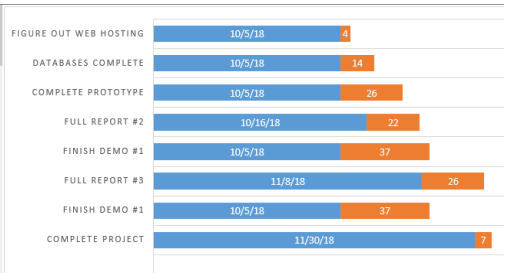


Figure 3: Gantt chart for Scheduling System

References