

Assignment 2: Requirement Analysis Diagrams

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Group 10

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Part 1: Use Case Identification

Use Case List

Use Case #	1
Name	Student Registration & Profile Creation
Related User	#1
Stories	
Actor(s)	Student
Brief	Student completes a signup form with required fields to create an initial profile.
Description	
Priority	Critical

Use Case #	2
Name	Secure Login (JWT)
Related User	#18
Stories	
Actor(s)	Student, Auth Service
Brief	Student authenticates; on success receives a session; on failure sees a safe error.
Description	
Priority	High

Use Case #	3
Name	Set Weekly Availability
Related User	#3
Stories	
Actor(s)	Student
Brief	Student selects and saves time blocks; the matching engine respects subsequent updates.
Description	
Priority	Critical

Use Case #	4
Name	Specify Study Location Preference
Related User	#4
Stories	
Actor(s)	Student
Brief	Student sets preferred study locations to improve match relevance.
Description	
Priority	Medium

Use Case #	5
Name	Real-Time Matchmaking
Related User	#2
Stories	
Actor(s)	Student, Matching Engine
Brief	Student views compatible classmates by course; results update instantly with filters.
Description	
Priority	Critical

Use Case #	6
Name	Receive Group Acceptance Notifications
Related User	#5
Stories	
Actor(s)	Student, Notification Service
Brief	Student receives in-app/email notifications upon acceptance to a group.
Description	
Priority	Critical

Use Case #	7
Name	ADA-Compliant Navigation
Related User	#6
Stories	
Actor(s)	Student (incl. assistive tech), UI
Brief	Keyboard focus order, landmarks, and alt text enable accessible navigation.
Description	
Priority	High

Use Case #	8
Name	Create Study Group
Related User	#7
Stories	
Actor(s)	Group Creator
Brief	Creator specifies course/section/title; group becomes listed and searchable.
Description	
Priority	Critical

Use Case #	9
Name	Set Group Member Limit
Related User	#8
Stories	
Actor(s)	Group Creator, System
Brief	Creator sets capacity; system enforces “group full” and waitlist.
Description	
Priority	Medium

Use Case #	10
Name	Add Group Description
Related User	#9
Stories	
Actor(s)	Group Creator
Brief	Creator adds a description clarifying group focus.
Description	
Priority	Medium

Use Case #	11
Name	Approve/Reject Join Requests
Related User	#12
Stories	
Actor(s)	Group Admin
Brief	Admin reviews join requests and approves/rejects; roster and notifications update.
Description	
Priority	Medium

Use Case #	12
Name	Remove Member
Related User	#10
Stories	
Actor(s)	Group Admin
Brief	Admin removes inactive or disruptive member; member is notified; action is auditable.
Description	
Priority	Medium

Use Case #	13
Name	Handle Behavior Reports
Related User	#11
Stories	
Actor(s)	Group Admin
Brief	Admin triages reports and applies actions (warn/remove/block).
Description	
Priority	Medium

Use Case #	14
Name	Global Navigation
Related User	#13
Stories	
Actor(s)	Student
Brief	Student uses navbar to access Profile, Courses, Matches, Groups, Settings.
Description	
Priority	Medium

Use Case #	15
Name	Browse/Create Classes
Related User	#14
Stories	
Actor(s)	Student
Brief	Student selects from catalog or creates a missing class/section with required fields.
Description	
Priority	High

Use Case #	16
Name	Edit Profile
Related User	#15
Stories	
Actor(s)	Student
Brief	Student updates profile/preferences; changes affect future matching.
Description	
Priority	Medium

Use Case #	17
Name	Group Messaging
Related User	#16
Stories	
Actor(s)	Group Member
Brief	Members post messages, replies, and reactions on a group page.
Description	
Priority	Medium

Use Case #	18
Name	Resource Sharing
Related User	#17
Stories	
Actor(s)	Group Member
Brief	Members share and view resources to collaborate.
Description	
Priority	Low

Use Case #	19
Name	Archive/Restore Group
Related User	#19
Stories	
Actor(s)	Group Admin
Brief	Admin archives inactive groups and can later restore them.
Description	
Priority	Low

Use Case #	20
Name	My Groups Dashboard
Related User	#20
Stories	
Actor(s)	Student
Brief	Student sees active groups as cards with next-meeting info.
Description	
Priority	Medium

Part 2: Use Case Diagrams

10 Top Priority Use Cases

1. Use Case #1: Student Registration & Profile Creation

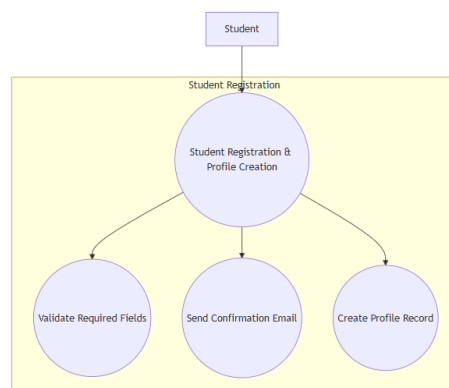
Related User Stories: #1

Actor(s): Student

Brief Description: Student completes a signup form with required fields to create an initial profile.

Priority: Critical.

Use-Case Diagram:



2. Use Case #2: Secure Login (JWT)

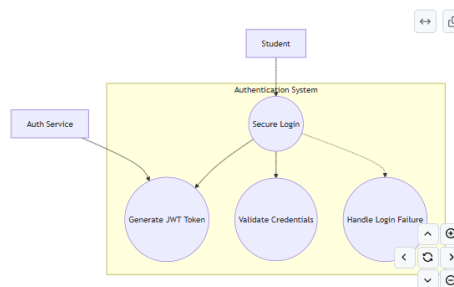
Related User Stories: #18

Actor(s): Student, Auth Service

Brief Description: Student authenticates; on success, receives a session; on failure, sees a safe error.

Priority: High.

Use-Case Diagram:



3. Use Case #3: Set Weekly Availability

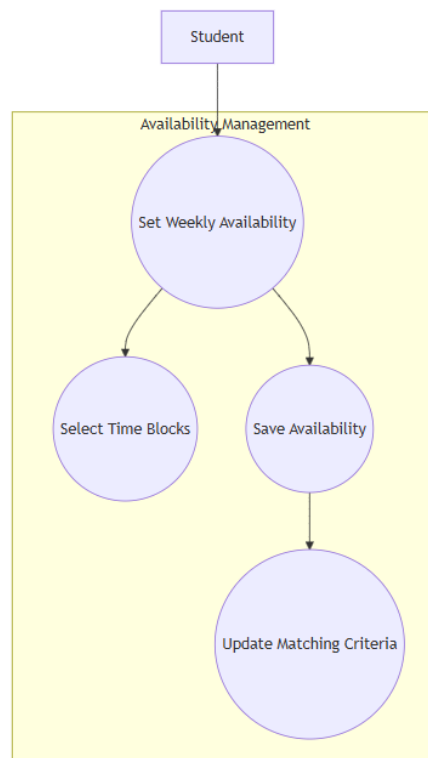
Related User Stories: #3

Actor(s): Student

Brief Description: Student selects and saves time blocks; matching respects updates.

Priority: Critical.

Use-Case Diagram:



4. Use Case #5: Real-Time Matchmaking

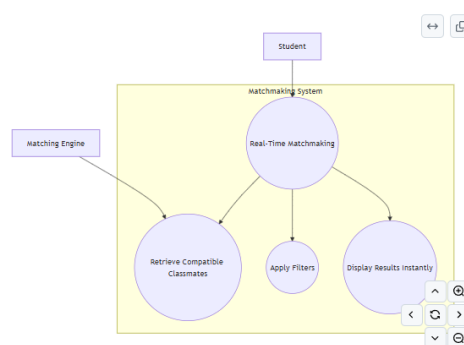
Related User Stories: #2

Actor(s): Student, Matching Engine

Brief Description: Student views compatible classmates by course; results update with filters instantly.

Priority: Critical.

Use-Case Diagram:



5. Use Case #8: Create Study Group

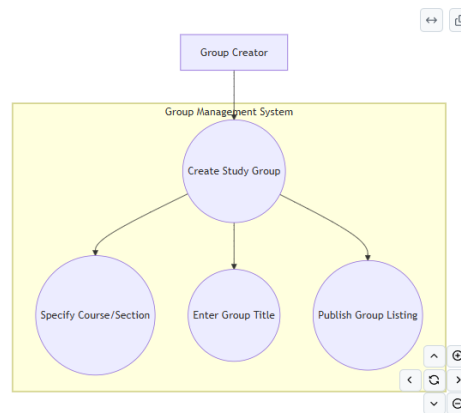
Related User Stories: #7

Actor(s): Group Creator

Brief Description: Creator specifies course/section/title; group becomes listed/searchable.

Priority: Critical.

Use-Case Diagram:



6. Use Case #11: Approve/Reject Join Requests

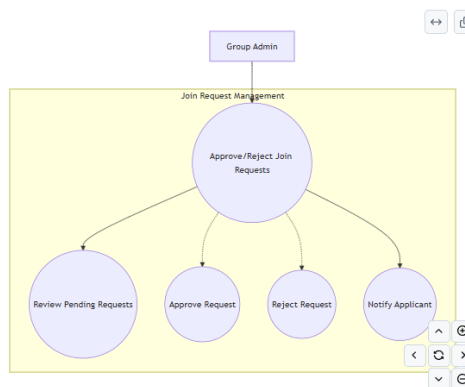
Related User Stories: #12

Actor(s): Group Admin

Brief Description: Admin reviews join requests and approves/rejects; roster and notifications update.

Priority: Medium.

Use-Case Diagram:



7. Use Case #14: Global Navigation

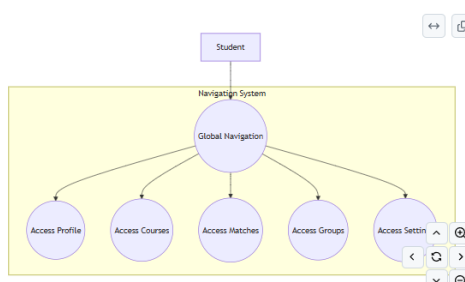
Related User Stories: #13

Actor(s): Student

Brief Description: Student uses navbar to access Profile, Courses, Matches, Groups, Settings.

Priority: Medium.

Use-Case Diagram:



8. Use Case #15: Browse/Create Classes

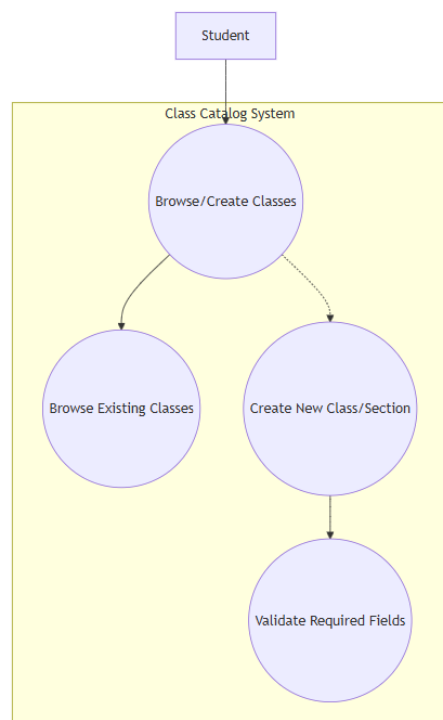
Related User Stories: #14

Actor(s): Student

Brief Description: Student selects from catalog or creates a missing class/section with required fields.

Priority: High.

Use-Case Diagram:



9. Use Case #17: Group Messaging

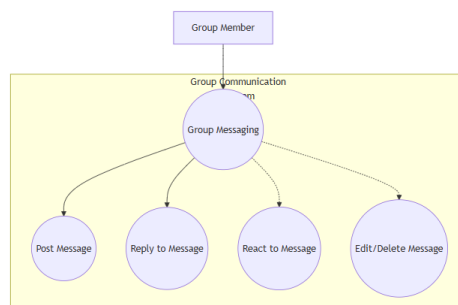
Related User Stories: #16

Actor(s): Group Member

Brief Description: Members post messages, replies, reactions on a group page.

Priority: Medium.

Use-Case Diagram:



10. Use Case #20: My Groups Dashboard

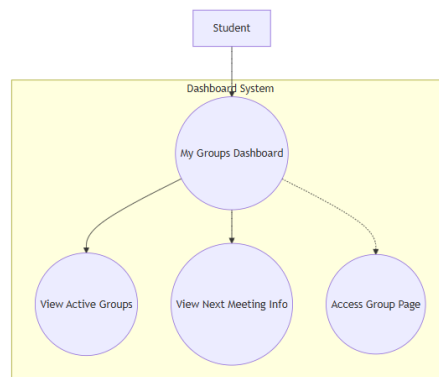
Related User Stories: #20

Actor(s): Student

Brief Description: Student sees active groups as cards with next-meeting info.

Priority: Medium.

Use-Case Diagram:



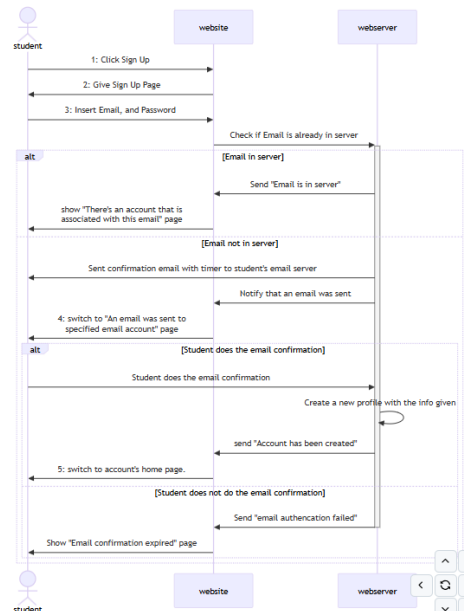
Full repository: github.com/parsa-hj/cs4090-assignment2

Part 3: Sequence Diagrams

1. Use Case #1: Student Registration & Profile Creation

Brief Description: Student completes a signup form with required fields to create an initial profile.

Sequence Diagram:



Key Interactions:

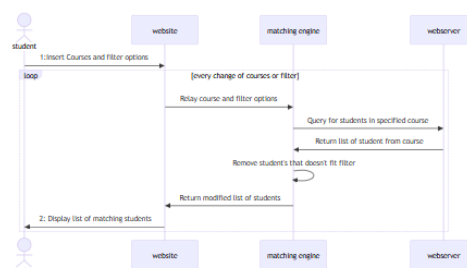
- Student inputs email and password.
- Server checks if email already exists.
- Server sends confirmation email if email is not present.
- Account is created when student accepts confirmation email.

Design Decision: Profile creation only occurs after confirmation to prevent abandoned profiles.

2. Use Case #5: Real-Time Matchmaking

Brief Description: Student views compatible classmates by course; results update with filters instantly.

Sequence Diagram:



Key Interactions:

- Student chooses course and filters.

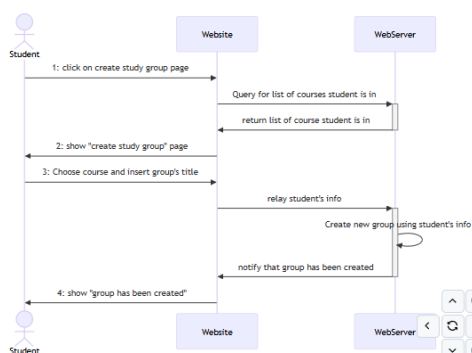
- Server returns list of students in the chosen course.
- Matching engine filters list based on selected filters.
- Website returns filtered list to student.

Design Decision: A loop keeps the view in sync as filters/courses change. (An optimization would be querying only on course changes, but we re-query on any change for clarity.)

3. Use Case #8: Create Study Group

Brief Description: Creator specifies course/section/title; group becomes listed/searchable.

Sequence Diagram:



Key Interactions:

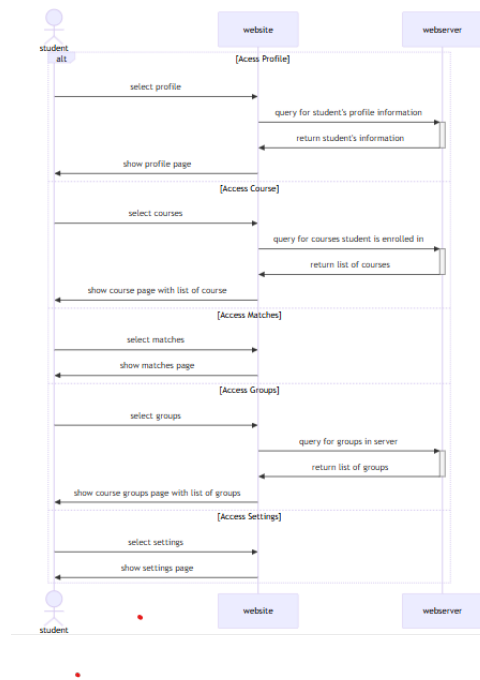
- Access create-group page.
- Query courses student is enrolled in.
- Student chooses course and group name.
- Server creates a new group from provided information.

Design Decision: Restrict creation to courses the student is enrolled in; improves UX by selecting from a pre-fetched list.

4. Alternate Flow

Brief Description: Alternative success path or optional steps that differ from the main scenario (e.g., deferred confirmation or late profile completion).

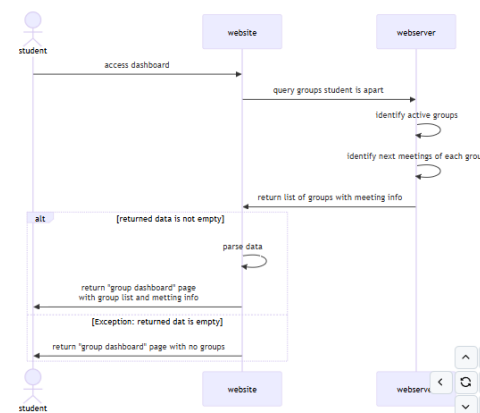
Sequence Diagram:



5. Exception Flow

Brief Description: Error/exceptional conditions (e.g., duplicate email, expired token, network failure) and recovery paths.

Sequence Diagram:



Repository (all Mermaid diagrams): github.com/parsa-hj/cs4090-assignment2

Part 4: Mermaid Codes

Student Registration Mermaid Graph

Listing 1: Mermaid Graph: Student Registration Process

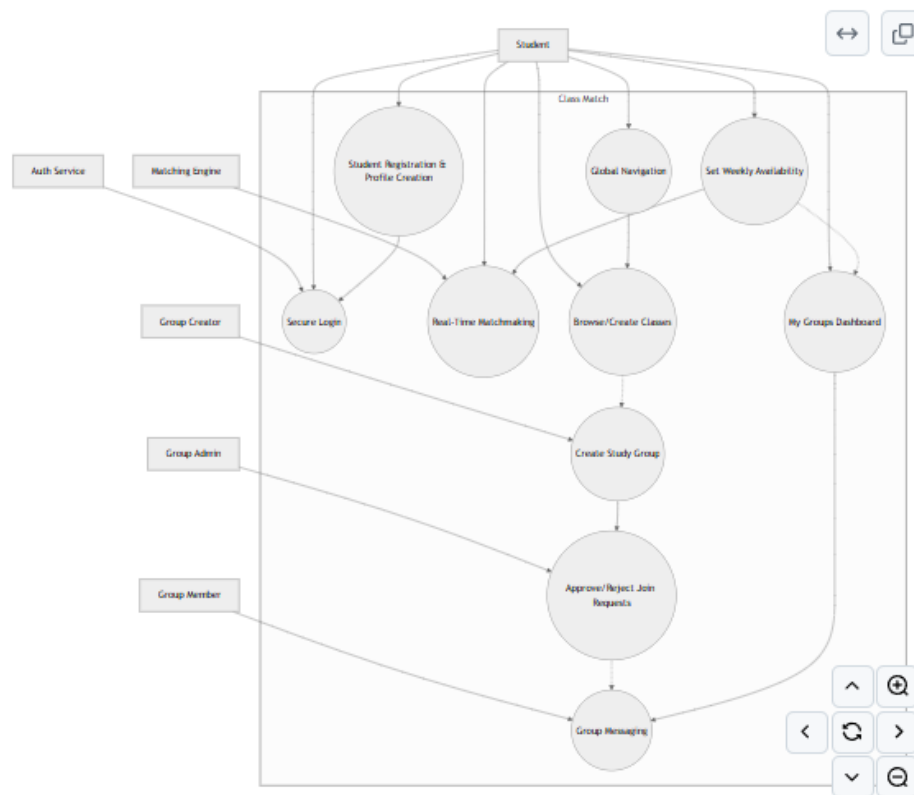
```
graph TD
    A[Student] --> B((Student Registration & Profile Creation))
    B --> C((Validate Required Fields)):::include
    B --> D((Send Confirmation Email)):::include
    B --> E((Create Profile Record)):::include

    subgraph "Student Registration System"
        B
        C
        D
        E
    end
end
```

For additional Mermaid sources, see: github.com/parsa-hj/cs4090-assignment2

Part 5 (Bonus): Complete System Use Case Diagram

Complete System Diagram



Repository: github.com/parsa-hj/cs4090-assignment2

Contribution

I contributed approximately **33%** to this assignment, and my teammates contributed **67%** collectively.

My contribution parts:

- Drafted and formatted *Part 1: Use Case Identification*.
- Assisted with sequence diagram structure and verification.
- Formatted final Overleaf layout with all sectioning and images.