

# **Assignment 2: Requirement Analysis Diagrams**

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**Group 10**

**CS 4090**

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## Part 1: Use Case Identification

### Use Case List

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

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

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

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

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

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

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

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

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

---

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

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

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

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

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

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

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

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

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

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

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

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## Part 2: Use Case Diagrams

### 10 Top Priority Use Cases

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

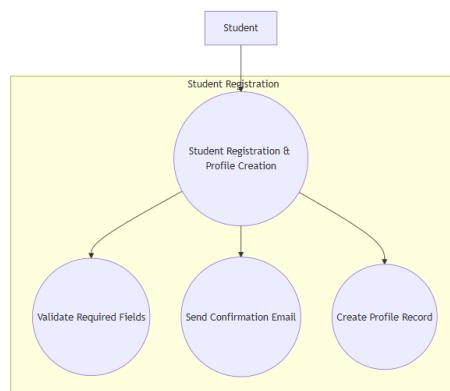
**Related User Stories:** #1

**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)

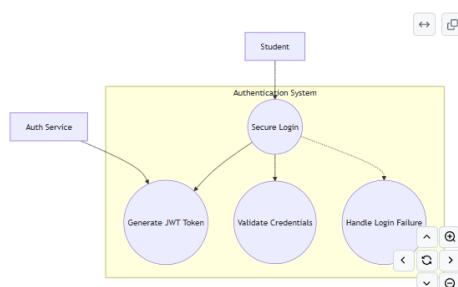
**Related User Stories:** #18

**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

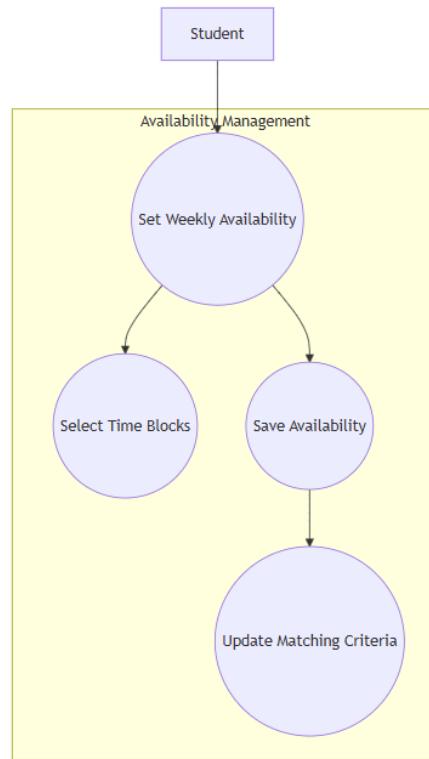
**Related User Stories:** #3

**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

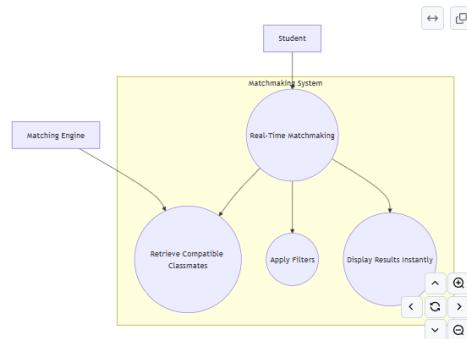
**Related User Stories:** #2

**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

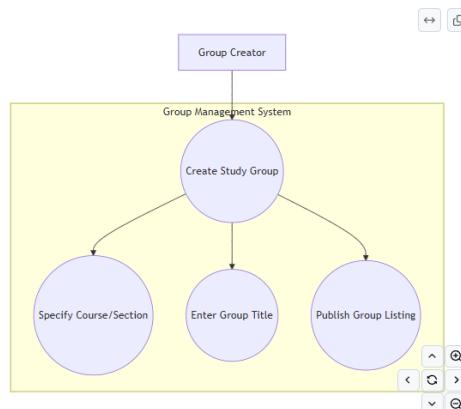
**Related User Stories:** #7

**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

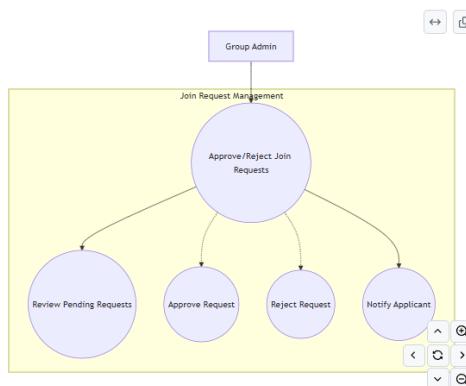
**Related User Stories:** #12

**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

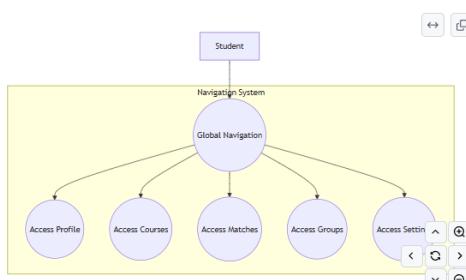
**Related User Stories:** #13

**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

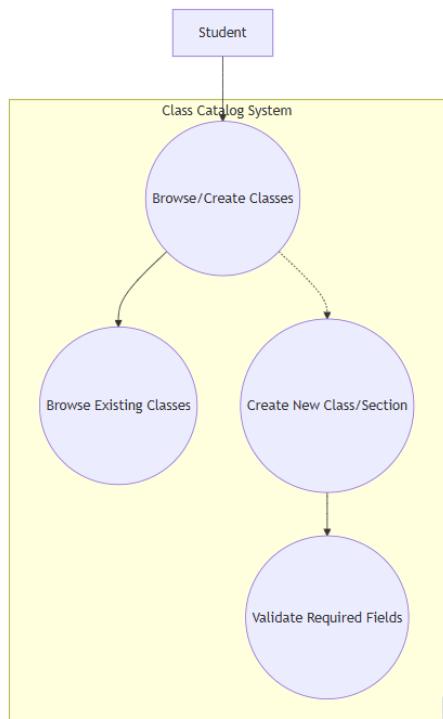
**Related User Stories:** #14

**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

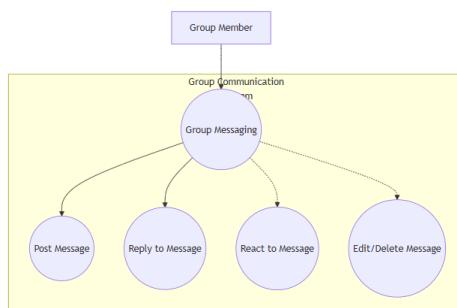
**Related User Stories:** #16

**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

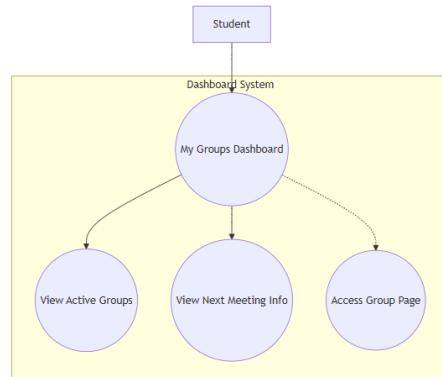
**Related User Stories:** #20

**Actor(s):** Student

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

**Priority:** Medium.

**Use-Case Diagram:**



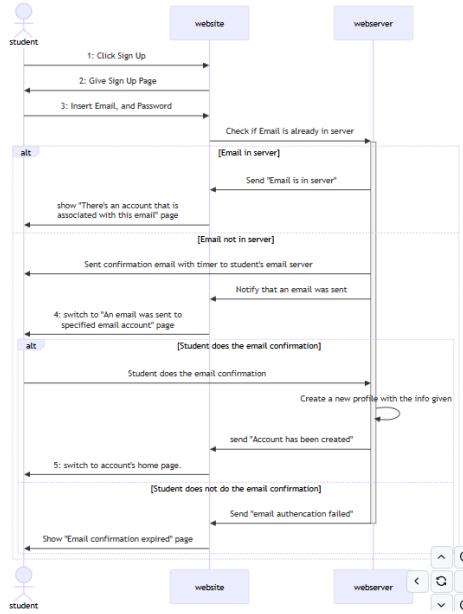
**Full repository:** [github.com/parsa-hj/cs4090-assignment2](https://github.com/parsa-hj/cs4090-assignment2)

## 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:

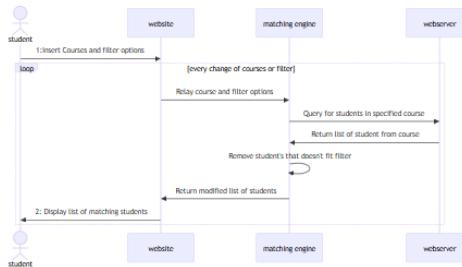
- Student inputs email and password.
- Server checks if email already exists.
- Server sends confirmation email if email is not present.
- Account is created when student accepts confirmation email.

**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:

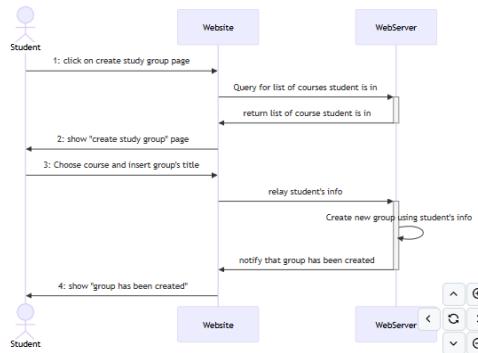
- Student chooses course and filters.

- 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:

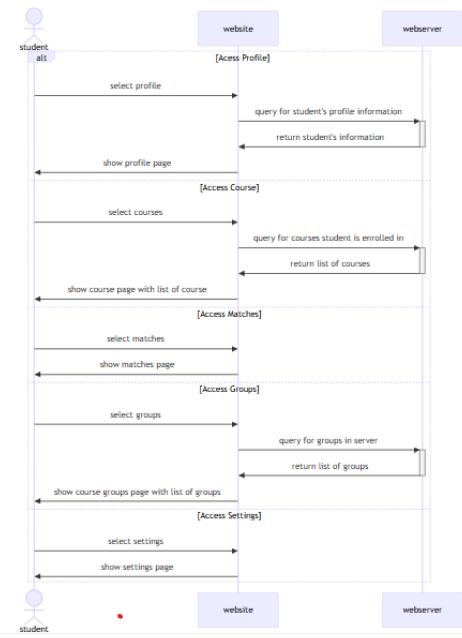
- Access create-group page.
- Query courses student is enrolled in.
- Student chooses course and group name.
- Server creates a new group from provided information.

**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).

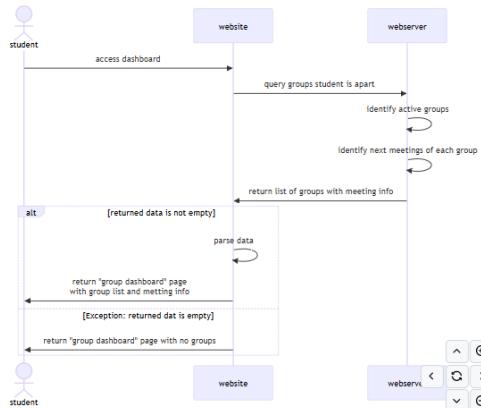
**Sequence Diagram:**



## 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](https://github.com/parsa-hj/cs4090-assignment2)

## Part 4: Mermaid Codes

### Student Registration Mermaid Graph

Listing 1: Mermaid Graph: Student Registration Process

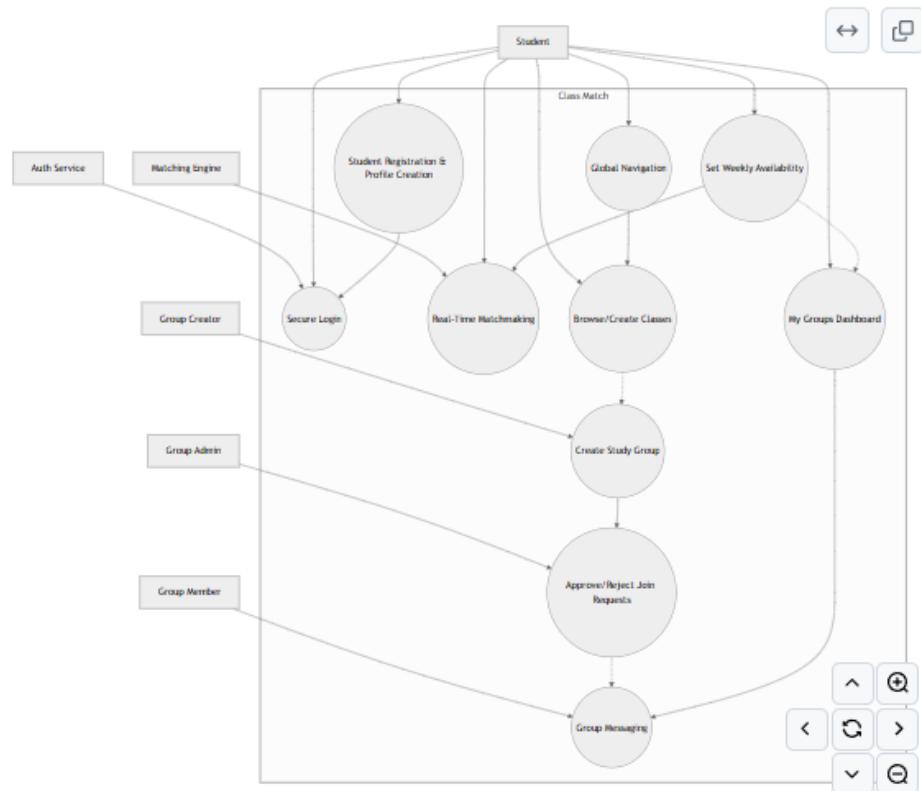
```
graph TD
    A[Student] --> B((Student Registration & Profile Creation))
    B --> C((Validate Required Fields))::: include
    B --> D((Send Confirmation Email))::: include
    B --> E((Create Profile Record))::: include

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

For additional Mermaid sources, see: [github.com/parsa-hj/cs4090-assignment2](https://github.com/parsa-hj/cs4090-assignment2)

## Part 5 (Bonus): Complete System Use Case Diagram

### Complete System Diagram



Repository: [github.com/parsa-hj/cs4090-assignment2](https://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.