Database Schema Diagram

assessmentresults
	Column	Type
🔑 ◆	resultid	int4
◆	userid	int4
◆	assessmentid	int4
◇	score	numeric
◇	generatedreport	text
◇	completeddate	timestamptz

feedback
	Column	Type
🔑 ◆	feedbackid	int4
◆	userid	int4
◇	feedbacktype	text
◇	message	text
◇	submitteddate	timestamptz

mentorships
	Column	Type
🔑 ◆	mentorshipid	int4
◆	mentorid	int4
◆	menteeid	int4
◇	startdate	timestamptz
◇	status	text

roadmapresources
	Column	Type
🔑 ◆	roadmapid	int4
🔑 ◆	resourceid	int4

assessments
	Column	Type
🔑 ◆	assessmentid	int4
◇	type	text
◇	description	text

learningresources
	Column	Type
🔑 ◆	resourceid	int4
◇	title	text
◇	url	text
◇	description	text

certificates
	Column	Type
🔑 ◆	certificateid	int4
◆	userid	int4
◇	title	text
◇	issuedate	timestamptz

notifications
	Column	Type
🔑 ◆	notificationid	int4
◆	userid	int4
◇	message	text
◇	isread	bool
◇	createddate	timestamptz

roadmapsteps
	Column	Type
🔑 ◆	stepid	int4
◆	roadmapid	int4
◇	stepdescription	text
◇	iscompleted	bool

roadmaps
	Column	Type
🔑 ◆	roadmapid	int4
◆	userid	int4
◇	roadmaptype	text
◇	createddate	timestamptz

communitymembers
	Column	Type
🔑 ◆	memberid	int4
◆	communityid	int4
◆	userid	int4
◇	role	text
◇	joineddate	timestamptz

users
	Column	Type
🔑 ◆	userid	int4
◇	name	text
◆ 🔒	email	text
◆	passwordhash	text
◇	role	text
◇	signupdate	timestamptz

communities
	Column	Type
🔑 ◆	communityid	int4
◆	name	text
◇	description	text
◇	createddate	timestamptz

userprofiles
	Column	Type
🔑 ◆	profileid	int4
◆	userid	int4
◇	goals	text
◇	interests	text
◇	skills	text

userbadges
	Column	Type
🔑 ◆	userbadgeid	int4
◆	userid	int4
◆	badgeid	int4
◇	earneddate	timestamptz

badges
	Column	Type
🔑 ◆	badgeid	int4
◆	name	text
◇	description	text

Legend: 🔑 Primary key · # Identity · 🔒 Unique · ◇ Nullable · ◆ Non-Nullable

Users

PK	**UserID SERIAL**
	Name TEXT
	Email TEXT UNIQUE NOT NULL
	PasswordHash TEXT NOT NULL
	Role TEXT CHECK (Role IN ('Student', 'Admin', 'Mentor')) DEFAULT 'Student'
	SignUpDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP

UserProfiles

PK	**UserID INT NOT NULL**
PK	**ProfileID SERIAL**
	Goals TEXT
	Interests TEXT
	Skills TEXT
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

RoadmapSteps

PK	**RoadmapID INT NOT NULL**
PK	**StepID SERIAL**
	StepDescription TEXT
	IsCompleted BOOLEAN DEFAULT FALSE
	FOREIGN KEY (RoadmapID) REFERENCES Roadmaps(RoadmapID) ON DELETE CASCADE

Assessments

PK	**AssessmentID SERIAL**
	Type TEXT CHECK (Type IN ('Personality', 'Skills'))
	Description TEXT

Roadmaps

PK	**UserID INT NOT NULL**
PK	**RoadmapID SERIAL**
	RoadmapType TEXT CHECK (RoadmapType IN ('Educational', 'Career'))
	CreatedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

CommunityMembers

PK	**UserID INT NOT NULL**
PK	**CommunityID INT NOT NULL**
PK	**MemberID SERIAL**
	Role TEXT CHECK (Role IN ('Member', 'Moderator'))
	JoinedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (CommunityID) REFERENCES Communities(CommunityID) ON DELETE CASCADE
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

AssessmentResults

PK	**AssessmentID INT NOT NULL**
PK	**UserID INT NOT NULL**
PK	**ResultID SERIAL**
	Score NUMERIC(5,2)
	GeneratedReport TEXT
	CompletedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE
	FOREIGN KEY (AssessmentID) REFERENCES Assessments(AssessmentID) ON DELETE CASCADE

Communities

PK	**CommunityID SERIAL**
	Name TEXT NOT NULL
	Description TEXT
	CreatedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP

UserBadges

PK	**BadgeID INT NOT NULL**
PK	**UserID INT NOT NULL**
PK	**UserBadgeID SERIAL**
	EarnedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE
	FOREIGN KEY (BadgeID) REFERENCES Badges(BadgeID) ON DELETE CASCADE

Certificates

PK	**UserID INT NOT NULL**
PK	**CertificateID SERIAL**
	Title TEXT
	IssueDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

Mentorships

PK	**MentorshipID SERIAL**
	MentorID INT NOT NULL
	MenteeID INT NOT NULL
	StartDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	Status TEXT CHECK (Status IN ('Active', 'Completed', 'Pending')) DEFAULT 'Pending'
	FOREIGN KEY (MentorID) REFERENCES Users(UserID) ON DELETE CASCADE
	FOREIGN KEY (MenteeID) REFERENCES Users(UserID) ON DELETE CASCADE

Badges

PK	**BadgeID SERIAL**
	Name TEXT NOT NULL
	Description TEXT

LearningResources

PK	**ResourceID SERIAL**
	Title TEXT
	URL TEXT
	Description TEXT

Notifications

PK	**UserID INT NOT NULL**
PK	**NotificationID SERIAL**
	Message TEXT
	IsRead BOOLEAN DEFAULT FALSE
	CreatedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

RoadmapResources

PK	**ResourceID INT NOT NULL**
PK	**RoadmapID INT NOT NULL**
	FOREIGN KEY (RoadmapID) REFERENCES Roadmaps(RoadmapID) ON DELETE CASCADE
	FOREIGN KEY (ResourceID) REFERENCES LearningResources(ResourceID) ON DELETE CAS…

Feedback

PK	**UserID INT NOT NULL**
PK	**FeedbackID SERIAL**
	FeedbackType TEXT CHECK (FeedbackType IN ('Bug Report', 'Feature Request', 'General'))
	Message TEXT
	SubmittedDate TIMESTAMPTZ DEFAULT CURRENT_TIMESTAMP
	FOREIGN KEY (UserID) REFERENCES Users(UserID) ON DELETE CASCADE

Assessment
- ○ AssessmentID: int
- ○ Type: String
- ○ Description: String
- ● createAssessment(): void

Community
- ○ CommunityID: int
- ○ Name: String
- ○ Description: String
- ● createCommunity(): void

User
- ○ UserID: int
- ○ Name: String
- ○ Email: String
- ○ PasswordHash: String
- ○ Role: String
- ○ SignUpDate: DateTime
- ● authenticate(): Boolean
- ● updateProfile(): void

Badge
- ○ BadgeID: int
- ○ Name: String
- ○ Description: String
- ● createBadge(): void

Feedback
- ○ FeedbackID: int
- ○ FeedbackType: String
- ○ Message: String
- ○ SubmittedDate: DateTime
- ● submitFeedback(): void

AssessmentResult
- ○ ResultID: int
- ○ Score: float
- ○ GeneratedReport: String
- ○ CompletedDate: DateTime
- ● generateReport(): void

CommunityMember
- ○ MemberID: int
- ○ Role: String
- ○ JoinedDate: DateTime
- ● joinCommunity(): void

Mentorship
- ○ MentorshipID: int
- ○ Status: String
- ○ StartDate: DateTime
- ● provideGuidance(): void

UserProfile
- ○ ProfileID: int
- ○ Goals: String
- ○ Interests: String
- ○ Skills: String
- ● updatePreferences(): void

Roadmap
- ○ RoadmapID: int
- ○ RoadmapType: String
- ○ CreatedDate: DateTime
- ● generateRoadmap(): void

Notification
- ○ NotificationID: int
- ○ Message: String
- ○ IsRead: Boolean
- ● notifyUser(): void

Certificate
- ○ CertificateID: int
- ○ Title: String
- ○ IssueDate: DateTime
- ● downloadCertificate(): void

UserBadge
- ○ EarnedDate: DateTime
- ● awardBadge(): void

RoadmapStep
- ○ StepID: int
- ○ StepDescription: String
- ○ IsCompleted: Boolean
- ● markAsCompleted(): void

LearningResource
- ○ ResourceID: int
- ○ Title: String
- ○ URL: String
- ○ Description: String
- ● addResource(): void

Actors: Student, Mentor, Admin

Lifelines: UIInterface, FacadeController, DomainMediator

- "Log In" Use Case
- "Take Personality Assessment" Use Case
- "Generate Personalized Roadmap" Use Case
- "Join Community" Use Case
- "Provide Platform Feedback" Use Case
- "Earn Badges" Use Case
- "Access Learning Resources" Use Case
- "Request Mentorship" Use Case
- "Offer Mentorship" Use Case
- "Moderate Community Discussions" Use Case
- "Monitor System Analytics" Use Case
- "Reset Password" Use Case

```
                                                    ●
                                          User logs into the system

                                      YES   Credentials valid?   NO
                                  Show user dashboard      Show login error
                                                                    ◉
                                        Select an action

                                        Selected Action

Take Assessment      Generate Roadmap          Join Community    Access Learning Resources   Request Mentorship   Provide Feedback      View Notifications              Earn Badges             Download Certificate      Moderate Community          Monitor System Analytics    Reset Password
Display available assessments                   Search for communities  Display learning resources  Display available mentors  User submits feedback   Fetch notifications            User completes a milestone   User selects certificate   Admin reviews flagged content   Admin requests analytics report    User submits reset request
                  YES  Assessments completed?  NO
User selects an assessment  Analyze assessment results  Prompt user to complete assessments  Display community list                               Store feedback                                                   Generate downloadable certificate                       Generate analytics data
                                                                              YES  Resources available?  NO          YES  Notifications available?  NO   YES  Badge already earned?  NO                   YES  Flagged content exists?  NO   YES  Email exists?  NO
Generate assessment questions  Generate personalized roadmap   User accesses a resource   Show no resources available                  Display notifications  Show no notifications message  Notify badge already earned  Award badge                          Admin takes moderation action  Show no flagged content   Send reset link    Show email not found error
                  Display roadmap                                                                       User submits mentorship request  Show confirmation                                                            Notify badge earned   Provide download link                                                   Display analytics report
Submit answers          ◇                   User selects a community                        Confirm request                                ◇                                 ◇             Update content status                                    Notify user to check email    ◇
Calculate results                           Join community                                                                                                                                      Notify moderation success             ◇
Display results                             Confirm membership                                                                                                                                          ◇

                                                                              ◇
                                                                      User logs out
                                                                              ◉
```

State diagram

LoggedOut
- AwaitingLogin

"Valid credentials" → LoggedIn
"Invalid credentials"

LoggedIn

- **Notifications**
  - ViewingNotifications
  - "Mark Notification as Read" → ManagingRead
  - "Return to Notifications"

- **Mentorship**
  - SearchingMentors
  - "View Mentor Details" → ViewingMentorProfile
  - "Send Request" → RequestingMentorship

- **Settings**
  - UpdatingProfile
  - "Change Password" → ChangingPassword
  - "Save and Return"

- **Community**
  - BrowsingCommunities
  - "View Details" → ViewingCommunityDetails
  - "Join Selected Community" → JoiningCommunity

- **Assessment**
  - SelectingAssessment
  - "Start" → TakingAssessment
  - "Submit Answers" → ViewingResults

- **Certificate**
  - SelectingCertificate
  - "Download Selected" → DownloadingCertificate

- **Badges**
  - ViewingBadges

- **Resources**
  - ViewingResources
  - "Select Resource" / "Finish Using Resource" → AccessingResource

- **Feedback**
  - SubmittingFeedback

- **Roadmap**
  - GeneratingRoadmap
  - "Roadmap Generated" → ViewingRoadmap
  - "Modify Roadmap" / "Save Changes" → ModifyingRoadmap

- Dashboard

"View Notifications" · "Request Mentorship" · "Manage Account Settings" · "Access Communities" · "Start Assessment" · "Download Certificate" · "View Earned Badges" · "Access Learning Resources" · "Submit Feedback" · "View/Generate Roadmap"

"Return to Dashboard" (from each state)

"Log Out" → Logout

"User Logs Out"