



COMSATS University Islamabad (CUI)

**Software Requirement Specification
(SRS DOCUMENT)**

for

BrainBee

Version 1.0

By

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A handwritten signature in blue ink, appearing to read "Tanveer Ahmad", is written over the name.

Bachelor of Computer Science (2022-2026)

Comments (by committee) *include the ones given at scope time both in doc and presentation	Action Taken
<p>Open Ai based Application doesn't justify learning of students.</p>	<p>In the Student App, we are redefining education by introducing personalization at its core. Every student's learning journey becomes unique as we generate quizzes, flashcards, topic summaries, and explanations tailored to their performance in assessments. This personalization enhances engagement and ensures that students focus on their areas of improvement, making learning more efficient and enjoyable. Students have the flexibility to engage in independent learning or receive guidance and supervision from teachers, ensuring a tailored educational experience.</p> <p>To complement this, we are launching a Teacher Portal designed to empower educators like never before. At the heart of this portal lies an advanced Machine Learning model that analyzes each student's performance and generates an optimized learning path. This cutting-edge feature ensures that teachers can easily guide students toward success with actionable insights.</p> <p>Teachers can create and manage classes, seamlessly adding students to foster collaboration. They gain a comprehensive overview of student activities, track performance through detailed analytics, and assign quizzes and assignments to ensure consistent</p>

	learning. Additionally, teachers can provide personalized feedback to guide students toward growth and excellence.
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Supervised by
Mr. Tanveer Ahmad

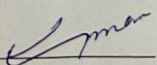
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Table of Contents

1. Introduction	14
1.1 Purpose:	14
1.2 Scope:	14
1.3 Modules	15
1.3.1 Student App:	15
1.3.2 Parent App:	17
1.3.3 Teacher:	18
2. Overall Description	19
2.1 Product Perspective: BrainBee	19
2.2 User classes and characteristics	20
2.3 Operating Environment	20
2.4 Design and Implementation Constraints	20
3. Requirement Identifying Technique	21
3.1 Use Case	21
3.1.1 Use Case Diagram	21
3.1.2 Detailed Use Cases	25
3.2 Event Response Tables	59
3.2.1 Parent Receives Quiz Completion Notification ERT	59
3.2.2 Teacher Receives Assignment Submission ERT	59
3.2.3 Internet Connection Lost ERT	59
3.2.4 Internet Connection Restored ERT	60
3.2.5 Weekly Report Generated ERT	60
3.2.6 Leaderboard Updated ERT	60
3.2.7 Goal Deadline Reached ERT	61
3.2.8 Quiz Time Limit Expires ERT	61
3.2.9 Assignment Deadline Passes ERT	61
4. Functional Requirements	62
4.1 UC-1: Register Account	62
4.1.1 FR-1: Account.Register	62
4.1.2 FR-2: Account.Validate	62
4.1.3 FR-3: Account.Invalid.Username	63
4.1.4 FR-4: Account.Invalid.Email	63

4.2	UC-2: Login	63
4.2.1	FR-5: Login.Information	63
4.2.2	FR-6: Login.Information.Validate.....	64
4.2.3	FR-7: Login.Information.Invalid.....	64
4.2.4	FR-8: Login.Information.Valid	65
4.2.5	FR-9: Password.Reset	65
4.2.6	FR-10: Password.Reset.EmailInput.....	65
4.2.7	FR-11: Password.Reset.Validate	66
4.2.8	FR-12: Password.Reset.Invalid	66
4.2.9	FR-13: Password.Reset.Information.....	67
4.2.10	FR-14: Password.Reset.New.....	67
4.2.11	FR-15: Password.New.Validate.....	67
4.2.12	FR-16: Password.New.Valid	68
4.2.13	FR-17: Password.New.Invalid.....	68
4.3	UC-3: Authentication via Google	69
4.3.1	FR-18: Login.Google.Option.....	69
4.3.2	FR-19: Login.Google.Information	69
4.3.3	FR-20: Login.Google.Information.Validate	69
4.4	UC-4: Edit Profile	70
4.4.1	FR-21: Profile.Edit	70
4.4.2	FR-22: Profile.Username.Validate	70
4.4.3	FR-23: Profile.Username.Invalid	71
4.4.4	FR-24: Profile.Password.Validate	71
4.4.5	FR-25: Profile.Password.Invalid	71
4.4.6	FR-26: Profile.Password.Confirm	72
4.4.7	FR-27: Profile.Password.Confirm.Validate	72
4.4.8	FR-28: Profile.Password.Confirm.Invalid	73
4.4.9	FR-29: Profile.Information.Update	73
4.5	UC-5: Logout.....	74
4.5.1	FR-30: Account.Logout	74
4.5.2	FR-31: Account.Logout.Confirmation	74
4.5.3	FR-32: Account.Logout.Confirm	74
4.5.4	FR-33: Account.Logout.Cancel.....	75
4.5.5	FR-34: Account.Logout.Internet	75

4.5.6	FR-30: Account.Logout	76
4.5.7	FR-31: Account.Logout.Confirmation	76
4.5.8	FR-32: Account.Logout.Confirm	76
4.5.9	FR-33: Account.Logout.Cancel.....	77
4.5.10	FR-34: Account.Logout.Internet.....	77
4.6	UC-6: Delete Account	78
4.6.1	FR-35: AccountDeletion.Initiation	78
4.6.2	FR-36: AccountDeletion.Confirmation	78
4.6.3	FR-37: AccountDeletion.Authentication	78
4.6.4	FR-38: AccountDeletion.Execution	79
4.6.5	FR-39: AccountDeletion.Notification	79
4.6.6	FR-40: AccountDeletion.Cancellation	79
4.6.7	FR-41: AccountDeletion.Authentication.Failure	79
4.6.8	FR-42: AccountDeletion.SystemError	80
4.7	UC-7: Switch Roles	80
4.7.1	FR-43: RoleSwitch.Initiation	80
4.7.2	FR-44: RoleSwitch.RoleList	81
4.7.3	FR-45: RoleSwitch.Authentication	81
4.7.4	FR-46: RoleSwitch.Execution	81
4.7.5	FR-47: RoleSwitch.Confirmation	81
4.7.6	FR-48: RoleSwitch.Cancellation	82
4.7.7	FR-49: RoleSwitch.NoRolesAvailable	82
4.7.8	FR-50: RoleSwitch.AuthenticationFailure.....	82
4.7.9	FR-51: RoleSwitch.SystemError.....	83
4.8	UC-8: Generate Summary/Explanation.....	83
4.8.1	FR-52: SummaryGeneration.Initiation.....	83
4.8.2	FR-53: SummaryGeneration.AIProcessing	84
4.8.3	FR-54: SummaryGeneration.Output	84
4.8.4	FR-55: SummaryGeneration. AdditionalDetail.....	84
4.8.5	FR-56: S SummaryGenerationFormatCustomization	85
4.8.6	FR-57: SummaryGeneration.AIError.....	85
4.8.7	FR-58: SummaryGeneration.InternetError.....	85
4.9	UC-9: Generate Quiz.....	86
4.9.1	FR-59: QuizGeneration.Initiation	86

4.9.2	FR-60: Quiz.Generation.Content.Selection	86
4.9.3	FR-61: QuizGeneration.AIProcessing	86
4.9.4	FR-62: QuizGeneration.Output	87
4.9.5	FR-63: QuizGeneration.Cancellation	87
4.9.6	FR-64: QuizGeneration.TopicSelection.....	87
4.9.7	FR-65: QuizGeneration.ALError	87
4.10	UC-10: Take Quiz	88
4.10.1	FR-66: TakeQuiz.Initiation.....	88
4.10.2	FR-67: TakeQuiz.Display.....	88
4.10.3	FR-68: TakeQuiz.AnswerSubmission	88
4.10.4	FR-69: TakeQuiz.AnswerRecording	89
4.10.5	FR-70: TakeQuiz.Completion	89
4.10.6	FR-71: TakeQuiz.ExitBeforeCompletion.....	89
4.10.7	FR-72: TakeQuiz.SummaryDisplay	90
4.10.8	FR-73: TakeQuiz.ReportGeneration	90
4.11	UC-11: Flashcard Generation	91
4.11.1	FR-74: FlashcardsGeneration.Initiation.....	91
4.11.2	FR-75: FlashcardsGeneration.Chapter/TopicSelection	91
4.11.3	FR-76: FlashcardsGeneration.PreferencesSpecification	91
4.11.4	FR-77: FlashcardsGeneration.Generate	92
4.11.5	FR-78: FlashcardsGeneration.Display.....	92
4.11.6	FR-79: FlashcardsGeneration.ALError.....	92
4.12	UC-12: Peer Competition	93
4.12.1	FR-80: Competition.Initiation	93
4.12.2	FR-81: Competition.FriendInvitation	93
4.12.3	FR-82: Competition.FriendSelection.....	93
4.12.4	FR-83: Competition.Initiation.Confirmation	94
4.12.5	FR-84: Competition.NoFriendsAvailable	94
4.12.6	FR-85: Competition.Initiation.Failure.....	94
4.13	UC-13: Generate Battle Report Card	95
4.13.1	FR-86: ReportCardGeneration.Initiation.....	95
4.13.2	FR-87: ReportCardGeneration.Initiation.....	95
4.13.3	FR-88: ReportCardGeneration.Generate	95
4.13.4	FR-89: ReportCardGeneration.Display	96

4.14	UC-14: View Battle History	96
4.14.1	FR-90: ViewBattleHistory.Initiation.....	96
4.14.2	FR-91: ViewBattleHistory.Retrieval.....	96
4.14.3	FR-92: ViewBattleHistory.Display.....	97
4.15	UC-15: View Competitor's Profiles.....	97
4.15.1	FR-93: ViewCompetitor'sProfile.Initiation	97
4.15.2	FR-93: ViewCompetitor'sProfile.Retrieval	97
4.15.3	FR-94: ViewCompetitor'sProfile.Display	98
4.15.4	FR-95: ViewCompetitor'sProfile.ProfileNotAvailable.....	98
4.15.5	FR-96: ViewCompetitor'sProfile.Display	98
4.16	UC-16: Access Class	99
4.16.1	FR-97: ClassAccess.Initiation.....	99
4.16.2	FR-98: ClassAccess.ClassListRetrieval.....	99
4.16.3	FR-99: ClassAccess.ClassListRetrieval.....	99
4.16.4	FR-100: ClassAccess.NoClassesToShow	100
4.16.5	FR-101: ClassAccess.RetrievalFailure.....	100
4.17	UC-17: Class Discussion	100
4.17.1	FR-102: ClassDiscussion.Initiation.....	100
4.17.2	FR-103: ClassDiscussion.Retrieval.....	100
4.17.3	FR-104: ClassDiscussion.Read	101
4.17.4	FR-105: ClassDiscussion.Reply	101
4.17.5	FR-106: ClassDiscussion.Reply	101
4.17.6	FR-107: ClassDiscussion.RetrievalFailure	102
4.18	UC-18: Download Class Materials	102
4.18.1	FR-108: MaterialsAccess.Initiation.....	102
4.18.2	FR-109: ClassMaterials.List.Retrieval.....	102
4.18.3	FR-110: ClassMaterials.Selection	103
4.18.4	FR-111: ClassMaterials.Download.Initiation.....	103
4.18.5	FR-112: ClassMaterials.Download.Initiation.....	103
4.18.6	FR-113: ClassMaterials.NotAvailable	104
4.18.7	FR-114: ClassMaterials.Download.Failure	104
4.19	UC-19: Participate in Class Quizzes	104
4.19.1	FR-114: QuizParticipation.Initiation	104
4.19.2	FR-115: QuizParticipation.Retrieval	105

4.19.3	FR-116: QuizParticipation.Questions.Presentation	105
4.19.4	FR-117: QuizParticipation.Answer.Submission	105
4.19.5	FR-118: QuizParticipation.NotAvailable	106
4.19.6	FR-119: QuizParticipation.Failure	106
4.20	UC-20: Submit Assignments	106
4.20.1	FR-120: AssignmentSubmission.Initiation	106
4.20.2	FR-121: AssignmentSubmission.List.Retrieval	107
4.20.3	FR-122: AssignmentSubmission.Selection	107
4.20.4	FR-123: AssignmentSubmission.Upload	107
4.20.5	FR-124: AssignmentSubmission.Confirmation	107
4.20.6	FR-125: AssignmentSubmission.NotAvailable	108
4.20.7	FR-126: AssignmentSubmission.Confirmation	108
4.21	UC-21: Maintain Streak	108
4.21.1	FR-127: MaintainStreak.CheckActivity	108
4.21.2	FR-128: MaintainStreak.UpdateCount	109
4.21.3	FR-129: MaintainStreak.CheckStreakInactivity	109
4.21.4	FR-130: MaintainStreak.ResetStreakToZero	109
4.21.5	FR-131: MaintainStreak.Notify	110
4.22	UC-22: View Badge	110
4.22.1	FR-132: BadgeView.Initiation	110
4.22.2	FR-133: BadgeView.Retrieval	110
4.22.3	FR-134: BadgeView.View	111
4.22.4	FR-135: BadgeView.View	111
4.22.5	FR-136: BadgeView.Retrieve.Failure	111
4.23	UC-23: Participate in Coin Quests	112
4.23.1	FR-137: CoinQuestParticipation.Initiation	112
4.23.2	FR-138: CoinQuestParticipation.List.Retrieval	112
4.23.3	FR-139: CoinQuestParticipation.Selection	112
4.23.4	FR-140: CoinQuestParticipation.displayQuestions	112
4.23.5	FR-141: CoinQuestParticipation.Completion	113
4.23.6	FR-142: CoinQuestParticipation.Reward	113
4.23.7	FR-143: CoinQuestParticipation.NotAvailable	113
4.23.8	FR-144: CoinQuestParticipation.Failure	114
4.24	UC-24: Interact with AI	114

4.24.1	FR-145: AllInteraction.Initiation	114
4.24.2	FR-146: AllInteraction.Input.....	114
4.24.3	FR-147: AllInteraction.Input.Processing	115
4.24.4	FR-148: AllInteraction.Response.Display	115
4.24.5	FR-149: AllInteraction.UnableToProcessQuery	115
4.24.6	FR-150: AllInteraction.Failure	116
4.25	UC-25: View LeaderBoard	116
4.25.1	FR-151: LeaderboardView.Initiation	116
4.25.2	FR-152: LeaderboardView.Filter.Selection	116
4.25.3	FR-153: LeaderboardView.FilteredData.Retrieval	117
4.25.4	FR-154: LeaderboardView.Position.Display	117
4.25.5	FR-155: LeaderboardView.NoDataAvailable	117
4.25.6	FR-156: LeaderboardView.Retrieval.Failure.....	117
4.26	UC-26: Check Overall Score.....	118
4.26.1	FR-157: ScoreCheck.Initiation	118
4.26.2	FR-158: ScoreCheck.Calculation	118
4.26.3	FR-159: OverallScore.Display	118
4.26.4	FR-160: OverallScore.Display	119
4.26.5	FR-161: OverallScore.NoScoresAvailable.....	119
4.26.6	FR-161: OverallScore.NoScoresAvailable.....	119
4.27	UC-27: Check book Score	120
4.27.1	FR-162: BookScoreCheck.Initiation	120
4.27.2	FR-163: BookScoreCheck.Book.Selection.....	120
4.27.3	FR-164: BookScoreCheck.Score.Calculation	121
4.27.4	FR-165: BookScoreCheck.Score.Display.....	121
4.27.5	FR-166: BookScoreCheck.Book.WeakPoints.Highlight.....	121
4.27.6	FR-167: BookScoreCheck.NoQuizzesCompleted	121
4.27.7	FR-168: BookScoreCheck.Retrieval.Failure	122
4.28	UC-28: Check Score for Specific Book	122
4.29	UC-29: Teacher Registration.....	122
4.29.1	FR-169: Account.Register	122
4.29.2	FR-170: Account.Validate.Email.....	123
4.29.3	FR-171: Account.Validate.Password.....	123
4.29.4	FR-172: Account.DuplicateEmail.Error.....	123

4.29.5	FR-173: Account.WeakPassword.Error	124
4.29.6	FR-174: Account.Confirmation	124
4.29.7	FR-75: Account.NoConnection.Error	124
4.30	UC-30: Create New Class	125
4.30.1	FR-176: Class.Create.....	125
4.30.2	FR-179: Class.Validate.Name	125
4.30.3	FR-180: Class.DuplicateName.Error	126
4.30.4	FR-181: Class.DuplicateName.ErrorClass.Generate.Code.....	126
4.30.5	FR-182: Class.Confirmation.....	126
4.30.6	FR-183: Class.SaveFailure.Error.....	126
4.31	UC-31: Add Students to a Class	127
4.31.1	FR-184: Students.Add.Manual	127
4.31.2	FR-185: Students.Add.Bulk.....	127
4.31.3	FR-186: Students.Validate.Email	127
4.31.4	FR-187: Students.BulkUpload.Error	128
4.31.5	FR-188: Students.InvalidEmail.Error	128
4.31.6	FR-189: Students.SendInvitations.....	129
4.31.7	FR-190: Students.Duplicate.Skip	129
4.32	UC-32: Monitor Student Performance.....	129
4.32.1	FR-191: Performance.View.....	129
4.32.2	FR-192: Performance.NoData.Error	130
4.32.3	FR-193: Performance.DataFailure.Error.....	130
4.32.4	FR-194: Performance.LearningPath.....	130
4.33	UC-33: Upload Assignment.....	131
4.33.1	FR-195: Assignment.Upload	131
4.33.2	FR-200: Assignment.Validate.Deadline	131
4.33.3	FR-201: Assignment.Edit	131
4.33.4	FR-202: Assignment.PastDeadline.Error	132
4.33.5	FR-203: Assignment.Publish.....	132
4.33.6	FR-204: Assignment.FileSize.Error	132
4.34	UC-34: Automated Quiz Grading with AI Feedback.....	133
4.34.1	FR-205: Quiz.Upload	133
4.34.2	FR-206: Quiz.AutoGrade	133
4.34.3	FR-207: Quiz.Feedback.Generate	134

4.34.4	FR-208: Quiz.Publish.Grades.....	134
4.34.5	FR-209: Quiz.ManualOverride	134
4.34.6	FR-210: Quiz.UnsupportedQuestion.Error.....	135
4.35	UC-35: Student Self-Registration.....	135
4.35.1	FR-211: Student.Register	135
4.35.2	FR-212: Student.Validate.Code.....	135
4.35.3	FR-213: Student.Validate.Email	136
4.35.4	FR-214: Student.InvalidCode.Error	136
4.35.5	FR-215: Student.Confirmation.....	136
4.36	UC-36: Register Account.....	137
4.36.1	FR-216: Account.Register.....	137
4.36.2	FR-217: Account.Validate.Email.....	137
4.36.3	FR-218: Account.Validate.Password	137
4.36.4	FR-219: Account.DuplicateEmail.Error	138
4.36.5	FR-220: Account.WeakPassword.Error.....	138
4.37	UC-37: Monitor Child's Progress.....	138
4.37.1	FR-221: Monitor.ChildProgress	138
4.37.2	FR-222: Child.ViewReportCard	139
4.37.3	FR-223: Child.ViewLeaderboard	139
4.37.4	FR-224: Child.WeeklyReport.....	139
4.38	UC-38: Set Learning Goals for Child	140
4.38.1	FR-225: Parent.SetGoals	140
4.38.2	FR-226: Parent.AssignRewards.....	140
4.38.3	FR-227: Parent.TrackGoalCompletion	140
4.39	Apple Authentication	141
4.39.1	FR-228: InitiateAppleAuthentication.Process	141
4.39.2	FR-229: Handle Apple Credential Submission	141
4.39.3	FR-230: Process Apple Permission Grant	141
4.39.4	FR-231: Complete Apple Authentication	142
4.39.5	FR-232: Handle Apple Authentication Failure	142
4.39.6	FR-233 Terminate Authentication on Cancel	143
4.40	FR's for Events.....	143
4.40.1	FR-234: ParentNotification onQuizCompletion.....	143
4.40.2	FR-235: TeacherNotificationonAssignmentSubmission	144

4.40.3	FR-236: HandleInternetConnectionLoss	144
4.40.4	FR-237: HandleInternetConnectionRestoration	144
4.40.5	FR-238: GenerateWeeklyReportforParents	145
4.40.6	FR-239: UpdateLeaderboardDaily.....	145
4.40.7	FR-240: HandleGoalDeadline	145
4.40.8	FR-241: HandleQuizTimeLimitExpiration.....	146
4.40.9	FR-242: HandleAssignmentDeadline	146
5.	Non-Functional Requirements.....	147
5.1	Usability	147
5.2	Performance	147
5.3	Interoperability	147
5.4	Security.....	147
5.5	Integrity.....	147
5.6	Scalability	147
5.7	Reliability	147
6.	External Interface Requirements.....	148
6.1	User Interface Requirements	148
6.2	Software Interfaces	148
6.3	Hardware Interfaces	148
6.4	Communication Interfaces	148
7.	References	148
8.	Plagiarism Report.....	150

1. Introduction

1.1 Purpose:

The purpose of the **BrainBee** project is to bridge the educational gap for students in rural and developing urban areas by providing an AI-driven, mobile-based learning platform. It aims to offer personalized, interactive, and gamified educational tools such as quizzes, flashcards, and peer competitions to enhance engagement and understanding. The platform also includes features for parental monitoring and teacher support, enabling real-time progress tracking, personalized feedback, and actionable insights. By making quality education affordable, accessible, and enjoyable, BrainBee seeks to empower students in Grades 5-12, regardless of their socioeconomic background or geographic location.

1.2 Scope:

The **BrainBee** project aims to develop a comprehensive mobile-based educational platform for Android and iOS, targeting students in Grades 5-12, with a focus on rural and developing urban areas of Pakistan. The platform will provide personalized learning tools, including AI-generated quizzes, flashcards, and topic summaries, tailored to individual student performance. It will feature a gamified "Battle" mode to encourage friendly peer competition, leaderboards to motivate students, and rewards such as badges and certificates to recognize achievements. Parents will have access to a dedicated dashboard to monitor their child's progress, set academic goals, and receive real-time notifications on quiz completions and goal achievements. Teachers will benefit from a portal that allows them to create and manage classes, track individual student performance, and generate personalized learning paths using AI-driven insights. The app will include an AI-powered chatbot for instant academic support, offering explanations and clarifications in real-time. Detailed analytics will be provided to students, parents, and teachers to track progress, identify learning gaps, and improve academic outcomes. Initially, the platform will focus on Physics, Chemistry, and Biology for 9th and 10th-grade students following the Punjab Board curriculum. The project will also build a secure backend infrastructure to handle user data, performance tracking, and personalized recommendations. Future expansions may include additional subjects, grade levels, and regional curricula to broaden its reach. Privacy and data protection will be prioritized to ensure a safe and secure learning environment for all users. The platform will exclude real-time tutoring services in its initial phase but will provide 24/7 AI-driven support for academic queries. The goal is to make quality education affordable, eaccessible, and enjoyable, bridging the gap between students in underprivileged areas and those in elite institutions. By offering structured, engaging, and interactive learning experiences, BrainBee aims to empower students, support parents, and assist teachers in delivering effective education, ultimately fostering equal learning opportunities for all.

1.3 Modules

1.3.1 Student App:

1.3.1.1 User Management:

This module handles the creation, management, and customization of user accounts for students. It allows students to register, update their profiles, and manage their academic preferences, such as grade level and subjects. Students can also share their progress with others.

FE-1: Maintains the types of users.

FE-2: Register and manage account details.

FE-3: User can update their profile details.

FE-4: User can delete their account.

FE-5: User can update the Grade.

FE-6: User can select/deselect the subjects.

FE-7: User can share the progress.

1.3.1.2 Learning Module:

This module provides students with AI-powered learning tools, including personalized summaries, flashcards, and explanations. It allows students to interact with an AI chatbot for doubt clarification and access class materials, discussions, and performance analytics.

FE-1: Generate AI based **personalized** quick summary or in-depth explanation of the topics from book .

FE-2: Allow the student to select the specific text form the topic and to clear their doubts by interacting with chatbot

FE-3: Allows the students to view **personalized** flash cards of the specific chapter of specific book.

FE-4: Displays a comprehensive view of all enrolled classes with key details such as class name, teacher.

FE-5: Allows students to access class materials.

FE-6: Allows students to engage in class discussions.

FE-7: Tracks students' grades for assignments, quizzes, and other assessments, along with monitoring academic progress through performance trends.

FE-8: Allows students to download notes, worksheets, and other educational materials for offline access.

1.3.1.3 Peer Competition Module:

This module fosters friendly competition among students through AI-generated quizzes and battles. Students can challenge peers, track their performance, and view their standings on leaderboards.

FE-1: Generate AI based quiz with random multiple-choice questions from topics

FE-2: Allows the student to initiate a new battle by selecting the topics, chapters of the book.

FE-3: Allows the student to invite the student into his friend list.

FE-4: Allows the student to invite the friend or share code to join without adding them.

FE-5: keeps track of the correct answers to the questions and monitor response time to help determine the winner.

FE-6: keeps the record of battle history.

FE-7: Allows the student to view the profile of the competitor.

FE-8: Keeps the battle info(loses/wins).

FE-9: Allows the student to view his position in the Leaderboard.

1.3.1.4 Assessment Module:

This module enables students to take AI-generated quizzes and tests, receive immediate feedback, and track their performance. It also allows students to submit assignments and view detailed report cards.

FE-1: Allows student to select a chapter or topic from a specific book to starting a app-level quiz.

FE-2: Generate AI based **personalized** quiz with random multiple-choice questions from selected topics or chapters.

FE-3: Allows the student to receive immediate feedback on each answer as the system checks their responses, indicating whether each answer is correct or incorrect.

FE-4: Give AI based explanation on wrong attempt

FE-5: Allows the student to view a summary of their quiz results at the end, showing the number of correct and incorrect answers.

FE-6: Generate a report card. And maintains its record.

FE-7: Affects the user's position on the leaderboard and maintains the streak score and daily lives

FE-8: Enables students to submit assignments required by teacher electronically with file uploads and tracks the submission status (pending, submitted, graded).

FE-9: Provides students with the ability to participate in quizzes/tests linked to courses, offering instant feedback and scores.

1.3.1.5 Achievement and Rewards Module:

This module motivates students by rewarding their achievements with badges, certificates, and coins. Students can redeem coins for valuable items and complete quests to earn more rewards.

FE-1: Allows the student to view badges.

FE-2: Allows the student to view, add or delete the certificates.

FE-3: Allows the student to redeem the coins in exchange for valuable items.

FE-4: Allows the student to take coin quests to earn coins.

1.3.1.6 Performance Analytics Module:

This module provides students with detailed insights into their academic performance. It includes features like overall scores, report cards, and leaderboard standings to help students track their progress.

FE-1: Allows the student to check the overall/book wise score.

FE-2: Allows the student to check detailed report card of a specific book.

FE-3: Allows the student to check weekly/monthly/yearly standing in the leaderboard.

1.3.1.7 AI Powered Assistant Module:

This module provides students with an AI-powered chatbot for instant academic support. The chatbot is fine-tuned on course materials and maintains a chat history for reference.

FE-1: Ask help from finetuned AI model on books(on which AI is finetuned). FE-2: Maintains Chat History.

1.3.2 Parent App:

1.3.2.1 User Management:

This module allows parents to create and manage their accounts. Parents can update their profiles and delete their accounts if needed.

FE-1: Maintains the types of users.

FE-2: Register and manage account details.

FE-3: User can update their profile details.

FE-4: User can delete their account.

1.3.2.2 Monitor Children:

This module enables parents to monitor their children's academic progress. Parents can view report cards, track activities, and receive real-time notifications about quiz completions and goal achievements.

FE-1: Add/delete children.

FE-2: Monitor the report cards of the specific child of specific book.

FE-3: Can track child's activity.

FE-4: Can view the position on leaderboard.

FE-5: Receive Weekly and Monthly reports of children.

FE-6: Receive Real Time notification on completion of quizzes, Goals(Assigned by parent)

1.3.2.3 Goals Module:

This module allows parents to set academic goals for their children and monitor their progress. Parents can assign rewards for goal achievements, such as coins.

FE-1: user can add/delete/update the goal.

FE-2: goal progress monitoring.

FE-3: Allow parents to assign rewards for goal achievements such as coins.

1.3.3 Teacher:

1.3.3.1 User Management:

This module allows teachers to create and manage their accounts. Teachers can update their profiles and delete their accounts if needed.

FE-1: Register and manage account details.

FE-2: User can update their profile details.

FE-3: User can delete their account.

1.3.3.2 Class Management:

This module enables teachers to create and manage classes, add/remove students, and upload class materials. Teachers can also create and upload quizzes using templates.

FE-1: Allows the user to create/delete multiple classes.

FE-2: Allows the user to add/delete students.

FE-3: Allows the user to add/delete and update materials.

FE-4: Allows the user to upload assignments FE-5: Allows the user to create from given templates to create and upload quizzes. FE-6: Enables teachers to participate in class discussions.

1.3.3.3 Assessment Module:

This module provides teachers with tools to monitor student performance, including quizzes and assignments. A machine learning algorithm offers detailed insights to help teachers create personalized learning paths for each student.

FE-1: Teacher can monitor the performance of each student, including quizzes by the teacher or by the app and assignments.

FE-2: A **Machine Learning algorithm** will provide the teacher with detailed performance insights, helping create a personalized learning path for each student.

2. Overall Description

2.1 Product Perspective: BrainBee

BrainBee is an AI-powered mobile application designed to revolutionize the learning experience for students from grades 5 to 12. Unlike traditional learning methods and existing educational applications, BrainBee personalizes education through AI-driven insights, interactive assessments, gamification, and parental monitoring.

Currently, students rely on various tools such as tutoring academies, assessment platforms, and educational apps that lack AI-driven personalization, real-time performance tracking, and gamified peer competition. BrainBee consolidates all these features into a single platform, offering structured learning paths, AI-generated quizzes, real-time feedback, and interactive learning experiences.

Teachers can utilize BrainBee's dedicated portal to create and manage classes, track student progress, and generate AI-driven learning recommendations. Parents can monitor their children's learning journeys through detailed progress reports, ensuring active engagement in their academic growth.

By combining AI-powered assistance, competitive learning, and comprehensive analytics, BrainBee aims to bridge the educational gap for students in urban and rural areas, making learning more accessible, engaging, and effective.

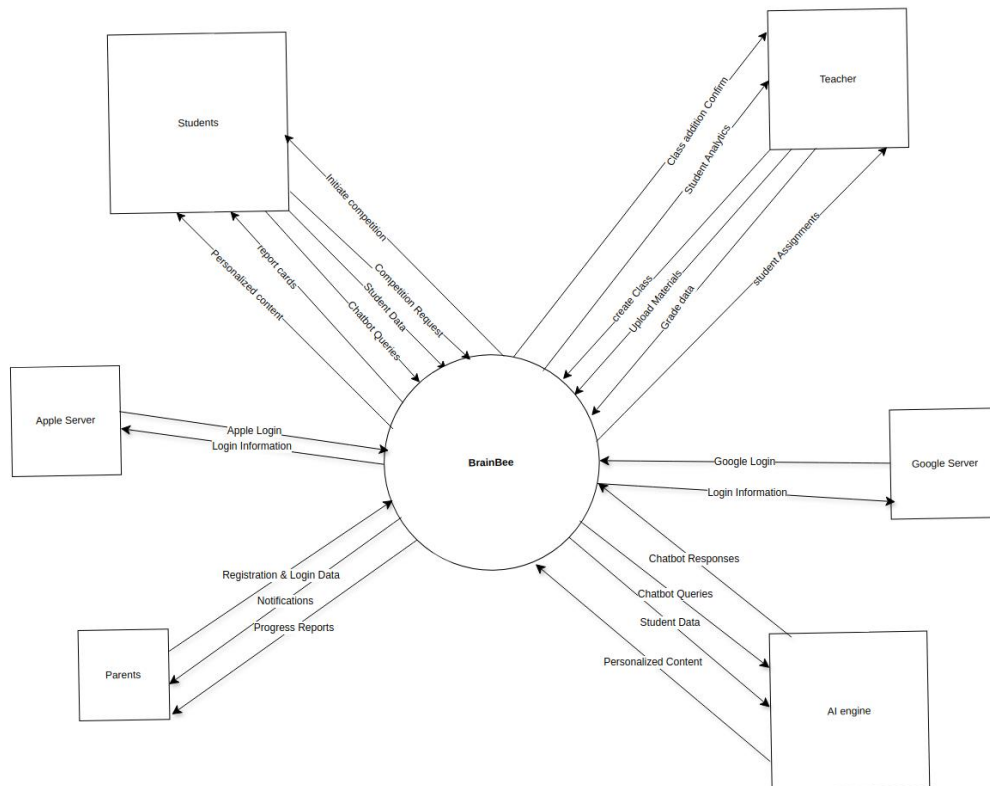


Figure 1: Context Diagram of System

2.2 User classes and characteristics

User class	Description
Student	Students are the primary users of BrainBee, engaging with various modules such as Flashcards, AI-generated quizzes, video lectures, and interactive learning experiences. They can participate in competitive learning through the Battle feature, collaborate with peers, and track their progress in real time. The platform provides an intuitive and gamified learning environment, ensuring students remain engaged while improving their academic performance. Given the user-friendly design, students require minimal assistance in using the application.
Parent	Parents use BrainBee to monitor their children's learning activities and progress. They can set academic goals, view detailed progress reports, and subscribe to premium features for enhanced learning experiences. The platform enables parents to oversee their children's engagement with different learning modules, ensuring they stay on track with their studies.
Teacher	Teachers have access to a dedicated portal where they can create and manage virtual classes, assign AI-generated quizzes, and track student performance. They can also provide personalized feedback and recommendations based on AI-driven insights. The system helps teachers facilitate a structured and interactive learning environment, reducing manual workload and improving student engagement.

2.3 Operating Environment

OE-1: BrainBee shall operate on the Android operating system versions 7.0 and above (API 24 and above) and iOS 12 and above to ensure compatibility with modern mobile devices.

OE-2: BrainBee shall require an active internet connection for accessing cloud-based features such as AI-generated quizzes, live classes, and real-time progress tracking. However, certain features like flashcards and previously downloaded notes/videos may be accessible offline.

OE-3: The application shall utilize **MongoDB** as its primary database for efficient storage, retrieval, and management of user data, learning materials, and progress tracking.

OE-4: BrainBee shall be optimized for smartphones and tablets, providing a responsive and interactive user interface to enhance learning engagement.

OE-5: The application shall integrate with third-party APIs where necessary, such as AI-based recommendation engines and video hosting services, to improve the learning experience.

2.4 Design and Implementation Constraints

CON-1: The user interface of the system shall be implemented using **Flutter** to ensure cross-platform compatibility on Android and iOS devices.

CON-2: The machine learning, natural language processing, and AI-driven features shall be developed using **Python 3** to support advanced educational analytics and personalized recommendations.

CON-3: The backend REST APIs shall be developed using **Node.js with Express.js** to ensure scalability, efficiency, and smooth integration with the frontend.

CON-4: The system shall store all data using **MongoDB**, as it provides flexible document-based storage, scalability, and efficient querying for handling learning content and user progress data.

3. Requirement Identifying Technique

3.1 Use Case

The first technique used in identifying requirements for the system is use cases. BrainBee has a lot of user involvement, and the user requirements are identified using this technique. The use case diagram representing the requirements of each user is given below. Detailed use cases are also present in the following sections.

3.1.1 Use Case Diagram

Figure 2 shows the major use cases of the actor Student, Figure 3 shows the major use cases of the actor Teacher and Figure 4 shows the major use cases of the actor Parent.



Figure 3: Use case Diagram of Parent

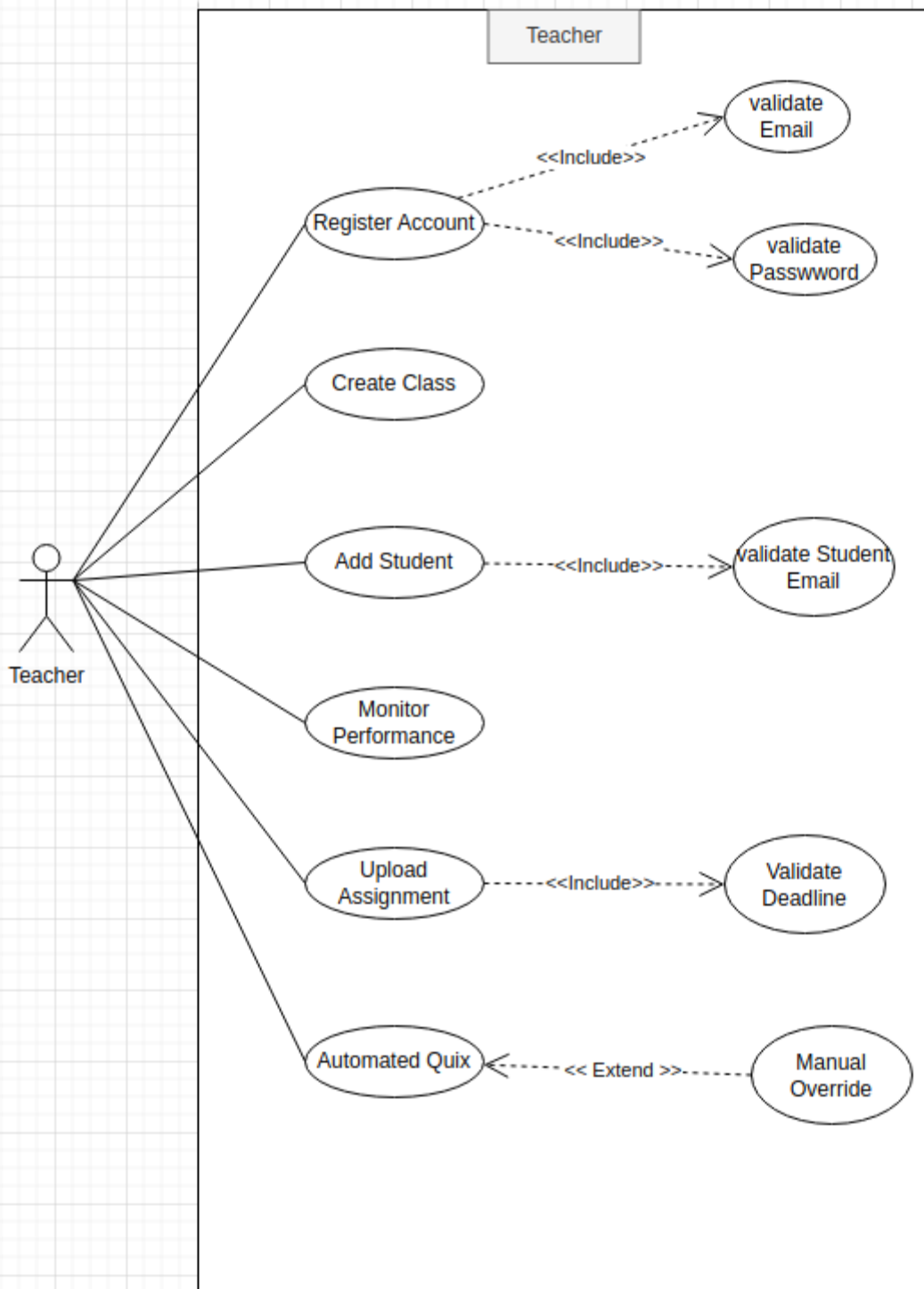


Figure 4: Use case Diagram of Teacher

3.1.2 Detailed Use Cases

UC-1: Register Account

Actors:	Primary Actor: User
Trigger:	User selects register account option after opening application.
Preconditions:	PRE-1: User has a valid phone number. PRE- 2: User has a valid email ID.
Postconditions:	POST-1: User's record is saved in the database. POST-2: User is redirected to application home page.
Normal Flow:	1.0 Register Account as User 1. User selects the register account option. 2. User enters the name. 3. User enters a username. (see 1.0. E1) 4. User enters the email id. (see 1.0. E2) 5. User enters the phone number. 6. User sets a password. 7. System displays a message of successful account creation
Alternative Flows:	1.1 Register as parent 1. User selects register as parent option. 2. Use Case resumes at step 2 of normal flow 1.2 Register as teacher 1. User selects register as teacher option. 2. Use Case resumes at step 2 of normal flow
Exceptions:	1.0. E1 Already registered username 1. The system displays an error message indicating that the username is already in use. 2a. If user decides to cancel the registration process, then System terminates use case. 2b. Else if user decides to enter a new username, then use case resumes at step 3 of normal flow. 1.0. E2 Already registered email 1. System displays an error message that the email is already registered. 2a. If user decides to cancel the registration process, then System terminates use case. 2b. Else if user decides to enter a new email ID, then use case resumes at step 4 of normal flow.
Business Rules:	BR-1: Only one account can be registered for a given username. BR-2: Only one account can be registered for a given email id.
Assumptions:	1. An active internet connection is available to the user. 2. User knows how to register applications

UC-2: Login

Actors:	Primary Actor: User
Trigger:	User selects login option after opening application.
Preconditions:	PRE-1: User has registered an account.
Postconditions:	POST-1: User is redirected to application home page

Normal Flow:	1.0 User Login <ol style="list-style-type: none"> 1. User selects the login option. 2. User enters a username. (see 1.0. E1) 3. User enters a password. (see 1.0. E2) 4. System verifies the information entered by the user.
Alternative Flows:	1.1 Forgot password (see 1.1. E1) <ol style="list-style-type: none"> 1. User selects the "forgot password" option. 2. System prompts the user to enter their registered email ID. 3. System validates the email ID. 4. System sends a recovery link to the user's email. 5. User accesses the link and sets a new password. 6. System updates the password for the given email ID.
Exceptions:	1.0. E1 Incorrect username <ol style="list-style-type: none"> 1. System informs the user that the entered username is not registered. 2a. If user decides to cancel the login process, then System terminates use case. 2b. Else if user decides to re-enter the username, then use case resumes at step 2 of the normal flow. 1.0. E2 Incorrect Password <ol style="list-style-type: none"> 1. System informs the user that the entered password is incorrect. 2a. If user decides to cancel the login process, then System terminates use case. 2b. Else if user decides to re-enter the password, then use case resumes at step 3 of the normal flow. 1.1. E1 Email id not registered <ol style="list-style-type: none"> 1. If the email entered to reset the password is not registered, the system notifies the user. 2a. If user decides to cancel the password recovery process, then System terminates use case. 2b. Else if user decides to re-enter the email ID, then use case resumes at step 2 of the alternative flow.
Business Rules:	BR-1: Only registered users can login the application. BR-2: Only the registered email id will receive email to reset password.
Assumptions:	<ol style="list-style-type: none"> 1. An active internet connection is available to the user. 2. The user has previously registered with the application.

UC-3: Authentication via Google

Actors:	Primary Actor: User, Secondary Actor: Google Server
Trigger:	User chooses the option to log in using Google credentials.
Preconditions:	PRE-1: User has a valid Google account. PRE-2: User has navigated to the login page of the application.
Postconditions:	POST-1: User has been authenticated and granted access to the application. POST-2: User's Google account is now linked with the application for future logins.

Normal Flow:	1.0 Login with Google (see 1.0. E1) <ol style="list-style-type: none"> 1. User selects the option to log in with Google. 2. The system redirects the user to Google's authentication page. 3. User provides Google account credentials or skips if already logged in. 4. User grants permission to the application. 5. System logs the user in using their Google credentials.
Alternative Flows:	N/A
Exceptions:	1.0. E1 Google Authentication Failed <ol style="list-style-type: none"> 1. System informs the user that Google authentication failed or was denied. 2a. If user decides to try logging in with Google again, use case resumes at step 3 of the normal flow. 2b. Else if user decides not to retry and cancels, use case terminates.
Business Rules:	BR-1: Only registered users can login the application. BR-2: Users who have previously linked their Google account with the application don't need to grant permission again, they will be logged in directly.
Assumptions:	<ol style="list-style-type: none"> 1. An active internet connection is available to the user. 2. Google's login service is available and operational.

UC-4: Edit Profile

Actors:	Primary Actor: User
Trigger:	User selects login option after opening application.
Preconditions:	PRE-1: User has registered an account.
Postconditions:	POST-1: User is redirected to application home page
Normal Flow:	1.0 User Login <ol style="list-style-type: none"> 5. User selects the login option. 6. User enters a username. (see 1.0. E1) 7. User enters a password. (see 1.0. E2) 8. System verifies the information entered by the user.
Alternative Flows:	1.1 Forgot password (see 1.1. E1) <ol style="list-style-type: none"> 7. User selects the "forgot password" option. 8. System prompts the user to enter their registered email ID. 9. System validates the email ID. 10. System sends a recovery link to the user's email. 11. User accesses the link and sets a new password. 12. System updates the password for the given email ID.

Exceptions:	<p>1.0. E1 Incorrect username</p> <ol style="list-style-type: none"> 1. System informs the user that the entered username is not registered. 2a. If user decides to cancel the login process, then System terminates use case. 2b. Else if user decides to re-enter the username, then use case resumes at step 2 of the normal flow. <p>1.0. E2 Incorrect Password</p> <ol style="list-style-type: none"> 2. System informs the user that the entered password is incorrect. 2a. If user decides to cancel the login process, then System terminates use case. 2b. Else if user decides to re-enter the password, then use case resumes at step 3 of the normal flow. <p>1.1. E1 Email id not registered</p> <ol style="list-style-type: none"> 1. If the email entered to reset the password is not registered, the system notifies the user. 2a. If user decides to cancel the password recovery process, then System terminates use case. 2b. Else if user decides to re-enter the email ID, then use case resumes at step 2 of the alternative flow.
Business Rules:	<p>BR-1: Only registered users can login the application.</p> <p>BR-2: Only the registered email id will receive email to reset password.</p>
Assumptions:	<ol style="list-style-type: none"> 3. An active internet connection is available to the user. 4. The user has previously registered with the application.

UC-5: Logout

Actors:	Primary Actor: User
Trigger:	User selects log out option on profile page.
Preconditions:	PRE-1: User has logged in to the application. PRE-2: User is on profile page.
Postconditions:	POST-1: User is logged out of the application.
Normal Flow:	<p>1.0 Initiate Logout Process</p> <ol style="list-style-type: none"> 1. User selects the logout option on the profile page. (see 1.1, 1.2) 2. System displays a confirmation message, "Are you sure you want to logout?" 3. User confirms their intention to logout by selecting "OK". (see 1.0. E1) 4. System logs the user out and redirects them to the login page.
Alternative Flows:	<p>1.1 Cancel logout process</p> <ol style="list-style-type: none"> 1. User selects the option to cancel during the logout confirmation step. (see 1.0) 2. System does not proceed with the logout and use case terminates. <p>1.2 No active internet connection</p>

	<ol style="list-style-type: none"> 1. User tries to logout without an active internet connection. (see 1.0) 2. System displays a message: "Internet connection is required to log out." 3. System does not proceed with the logout and use case terminates.
Exceptions:	1.0. E1 Server or system error during logout <ol style="list-style-type: none"> 1. System encounters an unexpected error, such as a server issue, during the logout process. 2a. If user attempts to logout again, the system retries the logout process. 2b. Else if user decides not to retry and cancels, the use case terminates.
Business Rules:	N/A
Assumptions:	<ol style="list-style-type: none"> 1. An active internet connection is available to the user.

UC-6: Delete Account

Actors:	Primary Actor: User(Teacher, Student, Parent)
Trigger:	User selects the "Delete Account" option from the application settings.
Preconditions:	PRE-1: The user must be logged into their account PRE-2: The user must have access to their registered email or phone number for verification.
Postconditions:	POST-1: The user's account and associated data are permanently deleted. POST-2: The user is logged out and redirected to the login/Signup.
Normal Flow:	1.0 Delete Account <ol style="list-style-type: none"> 1. The user navigates to the Account Settings and selects the Delete Account option. 2. The system prompts the user with a confirmation message explaining the consequences of deletion. 3. The user confirms their intent to delete the account. 4. The system requests authentication (e.g., re-enter password, OTP verification via email/phone). 5. The user provides the required authentication details. (see 1.0 E1) 6. The system verifies the authentication details. 7. If authentication is successful, the system deletes the user's account and associated data. (see 1.1 E2) 8. The system logs the user out and displays a confirmation message stating that the account has been deleted successfully. 9. The user is redirected to the login/Signup page.
Alternative Flows:	1.1 User Cancels Deletion <ol style="list-style-type: none"> 1. At step 3 of the normal flow, the user selects "Cancel" instead of confirming the deletion. 2. The system terminates the process and returns to the Account Settings page.

Exceptions:	<p>1.0 E1 Incorrect Authentication Details</p> <ol style="list-style-type: none"> 1. The system displays an error message if the user enters an incorrect password or OTP. 2. The user is given an option to re-enter the correct details. <p>1.1 E2 System Error</p> <ol style="list-style-type: none"> 1. If the system encounters an unexpected issue, an error message is displayed. 2. The system logs the issue for administrators. 3. The user is advised to try again later or contact support.
Business Rules:	BR-1: A deleted account cannot be recovered unless the system supports a temporary deactivation period
Assumptions:	<ol style="list-style-type: none"> 1. The user has sufficient privileges to delete their own account. 2. The user understands that deletion is permanent, and data cannot be restored. 3. An internet connection is available to complete the process.

UC-7: Switch Roles

Actors:	Primary Actor: User(Teacher, Student, Parent)
Trigger:	User selects the "Switch User" option from the application settings or profile menu.
Preconditions:	<p>PRE-1: The user must be logged into the application.</p> <p>PRE-2: The user must either have multiple roles or be allowed to create a new role.</p> <p>PRE-3: The user's credentials for the selected role must be valid.</p>
Postconditions:	<p>POST-1: The user is successfully switched to the selected role.</p> <p>POST-2: If the user had no other roles, they are redirected to the Role Creation process.</p> <p>POST-3: The system updates the user interface and permissions based on the new role.</p>
Normal Flow:	<p>1.0 Initiate Switch role Process</p> <ol style="list-style-type: none"> 1. The user navigates to Account Settings or Profile Menu and selects the Switch User option. 2. The system displays a list of available user roles (Student, Teacher, Parent) that the user can switch to. 3. The user selects the desired role from the available options. 4. The system prompts the user to enter their password. (see 1.0 E1) 5. The user provides authentication details. 6. The system verifies the authentication details. (see 1.0 E2)

	<ol style="list-style-type: none"> The system displays a confirmation message indicating that the switch was successful.
Alternative Flows:	<ol style="list-style-type: none"> 1.1 User Cancels Role Switching: <ol style="list-style-type: none"> At step 3 of the normal flow, the user decides not to switch and selects "Cancel" instead. The system terminates the process and returns to the previous screen. 1.2 User Has No Other Roles <ol style="list-style-type: none"> At step 2, if the user has no other roles, the system displays a message: <i>"You have no other roles available. Do you want to create a new role?"</i> If the user selects "Yes", the system redirects them to the Role Creation page. The user follows the Role Creation Process to add a new role. Once the role is successfully created, the system switches the user to the new role.
Exceptions:	<ol style="list-style-type: none"> 1.0 E1: Incorrect Password <ol style="list-style-type: none"> The system displays an error message and allows the user to try again. If multiple failed attempts occur, switching is temporarily blocked. 1.1 E2: System Error <ol style="list-style-type: none"> Occurs at step 7 of the normal flow. The system displays an error message, logs the issue, and advises the user to try again later.
Business Rules:	<ol style="list-style-type: none"> A user can only switch to roles they are authorized for (e.g., a student cannot switch to a teacher unless permitted). If role switching requires authentication, the user must provide valid credentials before switching. If the user has no other roles, they should be given an option to create a new role (if eligible). If role creation requires approval, the system must notify the admin before allowing access.
Assumptions:	<ol style="list-style-type: none"> The user has at least one existing role before switching. The user understands that switching roles changes their permissions and interface. An internet connection is available to complete the process. The user is eligible to create a new role if needed.

UC-8: Generate AI-Based Summary/Explanation

Actors	Primary Actor: Student Secondary Actor: AI Engine
Trigger	User selects the 'Generate Summary' or 'Explain Topic' option for a book or specific topic.

Preconditions	PRE-1: User has access to the learning module. PRE-2: User selects a book and a specific topic/chapter. PRE-3: The AI-based system is available and functioning.
Postconditions	POST-1: AI generates a personalized summary or explanation of the selected topic. POST-2: User receives a structured and readable output.
Normal Flow	1.0 Generate AI-Based Summary 1. User navigates to the learning module and selects a book. 2. User selects a specific topic/chapter for summarization or explanation. 3. User selects the 'Generate Summary' or 'Explain Topic' option. 4. The system processes the selected topic using AI-based text analysis. (see 1.0 E1) (see 1.1 E2) 5. The system generates a personalized summary or detailed explanation. 6. The system presents the output in a readable format.
Alternative Flows	1.1 User needs Explanation 1. User selects a specific topic/chapter for explanation. 2. User selects the 'Explain Topic' option and use case resumes at step two of normal flow.
Exceptions	1.0 E1: AI Processing Error 1. The system displays an error message: 'AI failed to generate summary. Please try again later.' 2. The user can retry. 1.1 E2: Poor Internet Connection 1. The system displays an error message: 'Internet connection is unstable. Please check your connection and try again.' 2. The user is advised to reconnect and retry.
Business Rules	BR-1: AI-generated summaries should be concise, structured, and easy to understand. BR-2: Users can request multiple summaries but should not exceed system limits (e.g., per day usage limit). BR-3: The system should prioritize accuracy and readability when generating explanations.
Assumptions	1. User has access to a stable internet connection. 2. AI has access to the relevant learning material for processing. 3. User understands how to navigate the learning module and use the summarization feature.

UC-9: Quiz Generation

Actors:	Primary Actor: Student Secondary Actor: AI System
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Trigger:	The student selects a book, chapter, or topic and requests quiz generation.
Preconditions:	PRE-1: The student is logged into the system. PRE-2: The selected book, chapter, or topic must exist in the system database
Postconditions:	POST-1: The system generates a quiz based on the selected content. POST-2: The user is redirected to the quiz interface.
Normal Flow:	1.0 Quiz Generation <ol style="list-style-type: none"> 1. The student selects the "Take Quiz" option. 2. The system prompts the user to select a book from the available list. 3. The student selects a chapter from the book. 4. The student confirms the selection and requests quiz generation. 5. The AI processes the content and generates a quiz with relevant questions. (see 1.0 E1) 6. The system displays a "Quiz Ready" message, allowing the student to start the quiz.
Alternative Flows:	1.1 Student Cancels Quiz Generation: <ol style="list-style-type: none"> 1. The student exits before quiz generation is completed. 2. The system does not store any data or generate a quiz 1.2 Student Selects a Specific Topic Instead of the Full Chapter: <ol style="list-style-type: none"> 1. Instead of generating a quiz from the entire chapter, the student selects a specific topic within the chapter. 2. The AI system generates a quiz only for the selected topic. (see 1.0 E1) 3. The use case resumes from Step 6 of the Normal Flow.
Exceptions:	1.0. E1: AI Fails to Generate Quiz <ol style="list-style-type: none"> 1. The system encounters an error while generating the quiz due to Network failure / Server issues / Unexpected system crash or timeout. 2. System displays an error message: "Quiz generation failed due to a system error. Please try again later."
Business Rules:	N/A
Assumptions:	<ol style="list-style-type: none"> 1. The student has internet access for AI to generate a quiz. 2. The selected book, chapter, or topic has structured data available for the AI model 3. The AI model can process and return quiz questions within a reasonable response time

UC-10: Take Quiz

Actors:	Primary Actor: Student Secondary Actor: AI System
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Trigger:	The student starts the quiz after it has been generated.
Preconditions:	PRE-1: The student must have an AI generated quiz ready. PRE-2: The student is logged into the system
Postconditions:	POST-1: The student completes all quiz questions. POST-2: The system stores quiz responses for further processing..
Normal Flow:	1.0 Take Quiz <ol style="list-style-type: none"> 1. The student selects "Start Quiz" from the quiz interface. 2. The system displays the first quiz question. 3. The student selects an answer and submits it. 4. The system records the answer and proceeds to the next question. 5. Steps 3-4 repeat until the student has answered all questions.(see 1.0 E1) 6. Upon completion, the system proceeds to the quiz summary screen.
Alternative Flows:	1.1 Student Exits Before Completing Quiz <ol style="list-style-type: none"> 1. The student chooses to exit before finishing the quiz.
Exceptions:	1.0 E1: Poor Internet Connection <ol style="list-style-type: none"> 1. The system displays an error message: 'Internet connection is unstable. Please check your connection and try again.' 2. The user is advised to reconnect and retry.
Business Rules:	BR-1: The quiz must present one question at a time for user interaction. BR-2: A user should not be able to skip a question without selecting an answer.
Assumptions:	<ol style="list-style-type: none"> 2. The Student should have a stable internet connection for real time quiz processing. 3. The AI system should have no technical issues. 4. The student should know how to interact with the quiz system and select answers.

UC-11: Generate Personalized Flash Cards

Actors:	Primary Actor: Student Secondary Actor: AI System
Trigger:	A Student indicates they want to generate personalized flashcards for a specific chapter or topic..
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has access to the chapter or topic they want to study.
Postconditions:	POST-1: The Student receives a set of personalized flashcards based on the selected chapter or topic

Normal Flow:	1.0: Generate Personalized Flashcards <ol style="list-style-type: none"> 1. The Student selects the "Generate Flashcards" option. 2. The Student chooses a specific chapter. 3. The Student specifies any additional preferences (number of flashcards). 4. The AI Engine analyzes the selected chapter or topic and generates personalized flashcards. (See 1.0 E1.) 5. The system displays the generated flashcards to the Student. 6. The Student can review, edit, or save the flashcards for future use.
Alternative Flows:	1.1: Generate Flashcards on the basis of the Topics <ol style="list-style-type: none"> 1. The student selects a specific topic from a chapter. 2. The Student specifies any additional preferences (number of flashcards). 3. The AI Engine analyzes the selected chapter or topic and generates personalized flashcards and use case resumes at step 5 of normal flow. (See 1.0 E1.) 1.2: Insufficient content for flashcards <ol style="list-style-type: none"> 1. The system informs the Student that there is not enough content to generate flashcards for the selected chapter or topic. 2. The Student may choose a different chapter or topic. 3. The use case resumes at step 2 of the normal flow.
Exceptions:	1.0: E1 AI Engine Failure <ol style="list-style-type: none"> 1. The system indicates a failure in generating the flashcards. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The AI Engine must generate flashcards based on the most relevant and important content from the selected chapter or topic. BR-2: Flashcards should be personalized according to the Student's preferences and past performance.
Assumptions:	<ol style="list-style-type: none"> 1. The Student has access to the necessary content for the selected chapter or topic. 2. The AI Engine is capable of analyzing and extracting key information for flashcard generation.

UC-12: Initiate Battle

Actors:	Primary Actor: Student
Trigger:	A Student initiates battle.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has access to the battle feature.

Postconditions:	POST-1: A battle is initiated, and the Student is matched with friends or random opponents.
Normal Flow:	1.0: Initiate Battle <ol style="list-style-type: none"> 1. The Student selects the "Initiate Battle" option. 2. The Student chooses to invite friends. 3. The Student selects friends from their friend list. 4. The battle is initiated, and the system proceeds to generate a quiz. (See 1.0 E1.)
Alternative Flows:	1.1: No friends available <ol style="list-style-type: none"> 1. The system informs the Student that no friends are available and suggests random matchmaking. 2. The use case resumes at step 4 of the normal flow.
Exceptions:	1.0: E1 Battle Initiation Failure <ol style="list-style-type: none"> 1. The system indicates a failure in initiating the battle. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The Student can only invite friends who are currently online and available.
Assumptions:	1. The student has an active internet connection.

UC-13: Generate Battle Report Card

Actors:	Primary Actor: Student
Trigger:	The system needs to generate a report card.
Preconditions:	PRE-1: The battle has been completed.
Postconditions:	POST-1: A report card is generated and presented to the Student.
Normal Flow:	1.0: Generate Report Card <ol style="list-style-type: none"> 1. The system calculates the results of the battle. 2. The system generates a report card detailing the Student's performance. (See 1.0 E1.) 3. The system presents the report card to the Student.
Alternative Flows:	1.1: No battle history available <ol style="list-style-type: none"> 1. The system informs the Student that there is no battle history available. 2. The use case terminates.
Exceptions:	1.0: E1 Battle History Retrieval Failure <ol style="list-style-type: none"> 1. The system indicates a failure in retrieving the battle history.

	2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The battle history must include details of each battle, including opponents and results.
Assumptions:	1. The student has an active internet connection. 2. The system has access to the necessary data to calculate the battle results.

UC-14: View Battle History

Actors:	Primary Actor: Student
Trigger:	A Student indicates they want to view their battle history.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has participated in at least one battle.
Postconditions:	POST-1: The Student views their battle history.
Normal Flow:	1.0: View Battle History 1. The Student selects the "View Battle History" option. 2. The system retrieves and displays the Student's battle history. Exception: See 1.0 E1. 3. The Student can review past battles, including results and report cards.
Alternative Flows:	1.1: No battle history available 1. The system informs the Student that there is no battle history available. 2. The use case terminates.
Exceptions:	1.0: E1 Report Generation Failure 1. The system indicates a failure in generating the report card. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The report card must include detailed performance metrics and comparisons with the opponent(s).
Assumptions:	1. The system maintains a record of all battles participated in by the Student.

UC-15: View Competitor's Profiles

Actors:	Primary Actor: Student
Trigger:	A Student indicates they want to view their battle history.
Preconditions:	PRE-1: The Student is logged into the application.

	PRE-2: The Student has participated in a battle with the competitor.
Postconditions:	POST-1: The Student views the competitor's profile.
Normal Flow:	1.0: View Competitor's Profile <ol style="list-style-type: none"> 1. The Student selects a competitor from their battle history or current battle. 2. The system retrieves and displays the competitor's profile. (See 1.0 E1). 3. The Student can review the competitor's details, including past performance and statistics.
Alternative Flows:	1.1: Competitor profile not available <ol style="list-style-type: none"> 1. The system informs the Student that the competitor's profile is not available. 2. The use case terminates.
Exceptions:	1.0: E1 Profile Retrieval Failure <ol style="list-style-type: none"> 1. The system indicates a failure in retrieving the competitor's profile. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Assumptions:	<ol style="list-style-type: none"> 1. The system maintains profiles for all users who have participated in battles.

UC-16: Access Class

Actors:	Primary Actor: Student
Trigger:	A Student wants to access their enrolled classes.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student is enrolled in at least one class.
Postconditions:	POST-1: The Student successfully accesses their enrolled classes.
Normal Flow:	1.0: Access Class <ol style="list-style-type: none"> 1. The Student selects the "Access Class" option. 2. The system retrieves and displays the list of enrolled classes.(see 1.0 E1) 3. The Student selects a class to view its details.
Alternative Flows:	1.1: No enrolled classes <ol style="list-style-type: none"> 1. The system informs the Student that they are not enrolled in any classes. 2. The use case terminates.

Exceptions:	1.0: E1 Class Retrieval Failure 1. The system indicates a failure in retrieving the enrolled classes. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only enrolled classes should be displayed to the Student.
Assumptions:	1. The system maintains a record of all classes the Student is enrolled in

UC-17: Engage in Class Discussion

Actors:	Primary Actor: Student
Trigger:	A Student wants to participate in class discussions.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has accessed a class.
Postconditions:	POST-1: The Student successfully participates in class discussions.
Normal Flow:	1.0: Engage in Class Discussions 1. The Student selects the "Discussions" option within a class. 2. The system displays the ongoing discussions for the class. .(see 1.0 E1) 3. The Student can read, reply, or start new discussion threads.
Alternative Flows:	N/A
Exceptions:	1.0: E1 Discussion Retrieval Failure 1. The system indicates a failure in retrieving the discussions. 2a. If the Student decides to cancel the process, the system terminates the use case.
Business Rules:	BR-1: Only students enrolled in the class can participate in its discussions.
Assumptions:	1. The system maintains a record of all discussions for each class.

UC-18: Download Class materials

Actors:	Primary Actor: Student
Trigger:	A Student wants to download materials provided by the teacher.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has accessed a class
Postconditions:	POST-1: The Student successfully downloads the materials.

Normal Flow:	1.0: Download Materials 1. The Student selects the "Materials" option within a class. 2. The system displays the list of available materials.(see 1.0 E1) 3. The Student selects a material to download. 4. The system initiates the download process. 5. The Student is notified of the successful download.
Alternative Flows:	1.1: No materials available 1. The system informs the Student that there are no materials available for download. 2. The use case terminates.
Exceptions:	1.0: E1 Download Failure 1. The system indicates a failure in downloading the material. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only materials provided by the teacher should be available for download.
Assumptions:	1. The system maintains a record of all materials for each class

UC-19: Participate in Quizzes

Actors:	Primary Actor: Student
Trigger:	A Student wants to participate in quizzes created by the teacher.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has accessed a class.
Postconditions:	POST-1: The Student successfully participates in the quiz.
Normal Flow:	1.0: Participate in Quizzes 1. The Student selects the "Quizzes" option within a class. 2. The system displays the list of available quizzes. 3. The Student selects a quiz to participate in.(see 1.0 E1) 4. The system presents the quiz questions to the Student. 5. The Student submits their answers. 6. The system evaluates the answers and provides feedback.
Alternative Flows:	1.1: No quizzes available 1. The system informs the Student that there are no quizzes available. 2. The use case terminates.
Exceptions:	1.0: E1 Quiz Participation Failure 1. The system indicates a failure in participating in the quiz. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.

Business Rules:	BR-1: Only quizzes created by the teacher should be available for participation.
Assumptions:	1. The system maintains a record of all quizzes for each class.

UC-20: Submit Assignment

Actors:	Primary Actor: Student
Trigger:	A Student wants to submit an assignment.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has accessed a class.
Postconditions:	POST-1: The Student successfully submits the assignment.
Normal Flow:	1.0: Submit Assignment 1. The Student selects the "Assignments" option within a class. 2. The system displays the list of assignments. 3. The Student selects an assignment to submit. (see 1.0 E1) 4. The Student uploads their completed assignment. 5. The system confirms the submission.
Alternative Flows:	1.1: No assignments available 1. The system informs the Student that there are no assignments available. 2. The use case terminates.
Exceptions:	1.0: E1 Assignment Submission Failure 1. The system indicates a failure in submitting the assignment. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only assignments provided by the teacher should be available for submission.
Assumptions:	1. The system maintains a record of all assignments for each class.

UC-21: Maintain Streaks

Actors:	Primary Actor: Student
Trigger:	A Student performs an activity that contributes to maintaining their streak.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has an active streak.
Postconditions:	POST-1: The Student's streak is updated and maintained.

Normal Flow:	1.0: Maintain Streaks <ol style="list-style-type: none"> 1. The Student completes an activity (e.g., quiz, assignment, discussion). 2. The system checks if the activity contributes to the streak. 3. The system updates the Student's streak count. (see 1.0 E1) 4. The Student is notified of their updated streak.
Alternative Flows:	1.1: Streak broken <ol style="list-style-type: none"> 1. The system detects that the Student has not completed an activity within the required time. 2. The system resets the Student's streak count to zero. 3. The Student is notified of the broken streak.
Exceptions:	1.0: E1 Streak Update Failure <ol style="list-style-type: none"> 1. The system indicates a failure in updating the streak. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only specific activities contribute to maintaining streaks.
Assumptions:	1. The system tracks the Student's activities and streak count.

UC-22: View Badges

Actors:	Primary Actor: Student
Trigger:	A Student wants to view their earned badges.
Preconditions:	PRE-1: The Student is logged into the application.
Postconditions:	POST-1: The Student successfully views their badges.
Normal Flow:	1.0: View Badges <ol style="list-style-type: none"> 1. The Student selects the "View Badges" option. 2. The system retrieves and displays the Student's earned badges. (see 1.0 E1) 3. The Student can view details of each badge.
Alternative Flows:	1.1: No badges earned <ol style="list-style-type: none"> 1. The system informs the Student that they have not earned any badges. 2. The use case terminates.
Exceptions:	1.0: E1 Badge Retrieval Failure <ol style="list-style-type: none"> 1. The system indicates a failure in retrieving the badges.

	2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only earned badges should be displayed to the Student
Assumptions:	1. The system maintains a record of all badges earned by the Student.

UC-24: Participate in Coin Quests

Actors:	Primary Actor: Student
Trigger:	A Student wants to participate in coin quests to earn coins.
Preconditions:	PRE-1: The Student is logged into the application.
Postconditions:	POST-1: The Student successfully participates in a coin quest and earns coins.
Normal Flow:	1.0: Participate in Coin Quests 1. The Student selects the "Coin Quests" option. 2. The system displays the list of available coin quests. 3. The Student selects a coin quest to participate in. (see 1.0 E1) 4. The system presents the quest details and requirements. 5. The Student completes the quest requirements. 6. The system awards coins to the Student.
Alternative Flows:	1.1: No quests available 1. The system informs the Student that there are no available coin quests. 2. The use case terminates.
Exceptions:	1.0: E1 Quest Participation Failure 1. The system indicates a failure in participating in the quest. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: Only completed quests should award coins.
Assumptions:	1. The system maintains a record of all available coin quests.

UC-25: Interact with AI

Actors:	Primary Actor: Student
Trigger:	A Student wants to interact with the AI for assistance or information.
Preconditions:	PRE-1: The Student is logged into the application.
Postconditions:	POST-1: The Student successfully interacts with the AI

Normal Flow:	1.0: Interact with AI 1. The Student selects the "Interact with AI" option. 2. The system initializes the AI interaction. (see 1.0 E1) 3. The Student inputs their query or request. 4. The AI processes the query and provides a response. 5. The Student views the AI's response.
Alternative Flows:	1.1: AI unable to process query 1. The AI indicates that it cannot process the query. 2. The Student may refine their query or cancel the interaction. 3. The use case resumes at step 3 of the normal flow.
Exceptions:	1.0: E1 AI Interaction Failure 1. The system indicates a failure in the AI interaction. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The AI must provide accurate and relevant responses to Student queries.
Assumptions:	1. The AI is capable of processing and responding to Student queries.

UC-26: View LeaderBoard

Actors:	Primary Actor: Student
Trigger:	A Student wants to view their position on the leaderboard.
Preconditions:	PRE-1: The Student is logged into the application.
Postconditions:	POST-1: The Student successfully views their position on the leaderboard.
Normal Flow:	1.0: View Leaderboard 1. The Student selects the "View Leaderboard" option. 2. The system retrieves and displays the leaderboard. (see 1.0 E1) 3. The Student can view their position and compare it with others.
Alternative Flows:	1.1: No leaderboard data available 1. The system informs the Student that there is no leaderboard data available. 2. The use case terminates.
Exceptions:	1.0: E1 Leaderboard Retrieval Failure 1. The system indicates a failure in retrieving the leaderboard. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.

Business Rules:	N/A
Assumptions:	1. The system maintains a record of all Student activities contributing to leaderboard positions.

UC-27: View Position on LeaderBoard

Actors:	Primary Actor: Student
Trigger:	A Student wants to view their leaderboard position filtered by year, week, or month.
Preconditions:	PRE-1: The Student is logged into the application.
Postconditions:	POST-1: The Student successfully views their filtered leaderboard position.
Normal Flow:	1.0: View Positions on Leaderboard 1. The Student selects the "View Leaderboard" option. 2. The Student chooses to filter the leaderboard by year, week, or month. 3. The system retrieves and displays the filtered leaderboard. (see 1.0 E1) 4. The Student views their position on the filtered leaderboard.
Alternative Flows:	1.1: No data available for selected filter 1. The system informs the Student that there is no data available for the selected filter. 2. The use case terminates.
Exceptions:	1.0: E1 Filtered Leaderboard Retrieval Failure 1. The system indicates a failure in retrieving the filtered leaderboard. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The leaderboard should be filterable by year, week, and month.
Assumptions:	1. The system maintains historical data for leaderboard positions.

UC-28: Check Overall Score

Actors:	Primary Actor: Student
Trigger:	A Student wants to check their overall score across all books.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has completed quizzes or activities in at least one book.

Postconditions:	POST-1: The Student successfully views their overall score across all books..
Normal Flow:	1.0: Check Overall Score 1. The Student selects the "Check Overall Score" option. 2. The system retrieves and calculates the Student's overall score across all books. (See 1.0 E1) 3. The system displays the overall score, along with a breakdown by subject or category. 4. The system highlights weak points and areas for improvement. 5. The Student reviews their overall performance and weak points.
Alternative Flows:	1.1: No scores available 1. The system informs the Student that there are no scores available for any books. 2. The use case terminates.
Exceptions:	1.0: E1 Overall Score Retrieval Failure 1. The system indicates a failure in retrieving the overall score. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The overall score should be calculated based on all completed quizzes and activities. BR-2: Weak points and areas for improvement should be highlighted based on performance.
Assumptions:	1. The system maintains a record of all quizzes and activities completed by the Student.

UC-29: Check Score for Specific Book

Actors:	Primary Actor: Student
Trigger:	A Student wants to check their score for quizzes related to a specific book.
Preconditions:	PRE-1: The Student is logged into the application. PRE-2: The Student has completed quizzes in the specific book.
Postconditions:	POST-1: The Student successfully views their score for quizzes related to the specific book.
Normal Flow:	1.0: Check Score for Specific Book 1. The Student selects the "Check Book Score" option. 2. The Student selects a specific book from their list of enrolled books. 3. The system retrieves and calculates the Student's score for quizzes related to the book. (See 1.0 E1) 4. The system displays the score, along with a breakdown by quiz or topic. 5. The system highlights weak points and areas for improvement specific to the book. 6. The Student reviews their performance and weak points for the specific book.
Alternative Flows:	1.1: No quizzes completed for the selected book

	1. The system informs the Student that they have not completed any quizzes for the selected book. 2. The use case terminates.
Exceptions:	1.0: E1 Book Score Retrieval Failure 1. The system indicates a failure in retrieving the score for the specific book. 2a. If the Student decides to cancel the process, the system terminates the use case. 2b. If the Student decides to retry, the system restarts the use case.
Business Rules:	BR-1: The score should be calculated based on all completed quizzes for the specific book. BR-2: Weak points and areas for improvement should be highlighted based on performance.
Assumptions:	1. The system maintains a record of all quizzes completed by the Student for each book.

UC-30: Teacher Registration

Actors:	Primary: Teacher Secondary: Institutional Database, Email Server
Trigger:	The teacher selects the "Register" option on the BrainBee app.
Preconditions:	PRE-1: Teacher has the BrainBee app installed on their device. PRE-2: Teacher has a stable internet connection. PRE-3: Teacher has a valid email address
Postconditions:	POST-1: A new teacher account is created and stored in the system's database. POST-2: A confirmation message is displayed, and a verification email is sent.
Normal Flow:	1.0 Register Account 1. The teacher opens the BrainBee app. 2. The teacher selects "Register" from the login screen. 3. Teacher enters: a. Full name b. Email address c. Password (meeting complexity requirements)

	<p>d. Phone number (optional)</p> <ol style="list-style-type: none"> The teacher submits the registration form. System validates: <ol style="list-style-type: none"> Email uniqueness (BR-1) Password strength (BR-2) The system creates an account and sends a confirmation email. Teacher receives a successful message.
Alternative Flows:	None
Exceptions:	<p>E1: Duplicate Email</p> <ol style="list-style-type: none"> If the email is already registered, the system displays: "Email already exists. Log in or use another email." Teacher returns to step 3b of Normal Flow. <p>E2: Weak Password</p> <ol style="list-style-type: none"> If the password does not meet complex rules, the system displays: "Password must include 8+ characters, uppercase, and a number." Teacher returns to step 3c of Normal Flow.
Business Rules:	<p>BR-1: Email addresses must be unique.</p> <p>BR-2: Password must contain 8+ characters, 1 uppercase letter, and 1 number.</p> <p>BR-3: Confirmation emails must be sent within 2 minutes of registration.</p>
Assumptions:	<ol style="list-style-type: none"> Teachers have access to a valid email inbox. Teachers understand password complexity requirements.

UC-31: Create New Class

Actors:	Primary: Teacher Secondary: Students
Trigger:	The teacher selects "Create New Class" from the Class Management section.
Preconditions:	PRE-1: Teacher is logged in. PRE-2: Teacher has no duplicate class names (BR-1).
Postconditions:	POST-1: New class is created with a unique ID. POST-2: Class appears in the teacher's dashboard.
Normal Flow:	<ol style="list-style-type: none">1. Teacher navigates to "Class Management."2. Teacher selects "Create New Class."3. Teacher enters:<ol style="list-style-type: none">a. Class name (e.g., "Grade 10 Biology")b. Subjectc. Grade leveld. Class schedule (optional)4. Teacher clicks "Save."5. System validates class name uniqueness (BR-1).6. System generates a class code for student enrollment.7. System displays: "Class created successfully."
Alternative Flows:	None
Exceptions:	E1: Duplicate Class Name <ol style="list-style-type: none">1. If the class name exists, the system displays: "Class name already in use. Please choose another."2. Teacher returns to step 3a of Normal Flow.
Business Rules:	BR-1: Class names must be unique per teacher. BR-2: Class codes must be auto-generated and alphanumeric (6 characters).

Assumptions:	1. Teachers know their subject and grade-level details. 2. Classes are created before adding students.
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UC-32: Add Students to a Class

Actors:	Primary: Teacher Secondary: System, Student
Trigger:	Teacher selects "Add Students" in an existing class.
Preconditions:	PRE-1: Teacher has an active class. PRE-2: Student emails are valid (BR-1).
Postconditions:	POST-1: Students receive enrollment invitations. POST-2: Students appear in the class roster.
Normal Flow:	1.0: Teacher creates class manually <ol style="list-style-type: none"> Teacher navigates to "Class Management." The teacher selects the target class. Teacher clicks "Add Students." Teacher manually enters student emails The system validates email formats (BR-1). System sends invitations to students.
Alternative Flows:	2.0: Teacher creates class from csv file <ol style="list-style-type: none"> Teacher navigates to "Class Management." The teacher selects the target class. Teacher clicks "Add Students." Teacher uploads a CSV file with student data The system validates email formats (BR-1). System sends invitations to students.
Exceptions:	E1: Duplicate Class Name <ol style="list-style-type: none"> If CSV files have errors, the system highlights invalid rows. E2: Invalid Email Format <ol style="list-style-type: none"> System detects invalid emails. System displays: "Invalid email(s). Please correct and retry."

Business Rules:	BR-1: Student emails must follow standard email format (e.g., student@domain.com). BR-2: Invitations expire after 7 days.
Assumptions:	1. Teachers have access to student email lists. 2. Students have active email accounts.

UC-33: Monitor Student Performance

Actors:	Primary Actor: Teacher Secondary Actor: System, Student
Trigger:	Teacher selects "View Performance" in the Assessment Module.
Precondition:	PRE-1: Students have completed quizzes/assignments. PRE-2: Performance data is available.
Postcondition:	POST-1: Teacher views analytics (e.g., scores, progress trends). POST-2: Teacher can adjust learning paths based on data.
Normal Flow	<ol style="list-style-type: none"> Teacher navigates to "Assessment Module." Teacher selects a class and student. System displays: <ol style="list-style-type: none"> Quiz/assignment scores Progress graphs AI-generated insights (e.g., "Student struggles with Algebra") Teacher selects "Create Learning Path" to assign remedial materials.
Alternative Flow	None
Exceptions	E1: Data Fetch Failure <ol style="list-style-type: none"> System fails to load data. System displays: "Error loading data. Try again later."
Business Rules	BR-1: Data updates in real-time after quiz submissions. BR-2: AI insights are generated only if ≥ 3 assessments are completed
Assumptions:	<ol style="list-style-type: none"> Quizzes/assignments are graded automatically by the system. Teachers use data to personalize instruction.

UC-34: Upload Assignment

Actors:	Primary Actor: Teacher Secondary Actor: System
Trigger:	Teacher selects "Upload Assignment" in a class.
Precondition:	PRE-1: Teacher is logged in. PRE-2: Class exists.
Postcondition:	POST-1: Assignment is visible to students. POST-2: Deadline reminders are scheduled
Normal Flow	<ol style="list-style-type: none">1. Teacher navigates to "Class Management."2. Teacher selects a class.3. Teacher clicks "Upload Assignment."4. Teacher enters:<ol style="list-style-type: none">a. Assignment titleb. Instructions (text/PDF)c. Deadlined. Attachments (optional)5. Teacher clicks "Publish."6. System validates deadline (must be future date).7. System sends notifications to students.
Alternative Flow	None
Exceptions	E1: File Upload Failure <ol style="list-style-type: none">1. System rejects large files (>10MB).2. System displays: "File size exceeds limit. Max 10MB."
Business Rules	BR-1: Assignments must include a title and deadline. BR-2: Notifications are sent 24 hours before the deadline.
Assumptions:	1. Teachers prepare assignments in compatible formats (PDF, DOCX).

UC-35: Automated Quiz Grading with AI Feedback

Actors:	Primary Actor: Teacher Secondary Actor: System, AI Grading Model
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Trigger:	The teacher uploads a quiz for grading.
Precondition:	PRE-1: Quiz is in a supported format (PDF, DOCX, or app-generated). PRE-2: Answer key is provided, or AI model is pre-trained on the subject.
Postcondition:	POST-1: All student submissions are graded. POST-2: AI-generated feedback is attached to each quiz.
Normal Flow	<ol style="list-style-type: none"> 1. Teacher uploads a quiz file or creates one in-app. 2. Teacher selects "Auto-Grade with AI." 3. System processes submissions using: <ol style="list-style-type: none"> a. NLP for essay/short-answer grading. b. Rule-based scoring for multiple-choice. 4. AI highlights common errors (e.g., "5 students missed Question 3"). 5. The system generates per-student feedback (e.g., "Revise topic: Quadratic Equations"). 6. Grades and feedback are published to student dashboards.
Alternative Flow	6.1 Manual Override <ol style="list-style-type: none"> 1. Teacher reviews AI-graded quizzes. 2. Teacher edits scores/feedback and clicks "Re-publish."
Exceptions	E1: Unsupported Question Type <ol style="list-style-type: none"> 1. AI flags ungradable questions (e.g., diagrams). 2. System alerts teacher: "Manually grade 2/10 questions."
Business Rules	BR-1: AI grading accuracy must exceed 90% for multiple-choice. BR-2: Feedback must align with curriculum standards.
Assumptions:	<ol style="list-style-type: none"> 1. Quizzes are structured clearly (e.g., numbered questions). 2. Teachers review AI feedback before publishing.

UC-36: Student Self-Registration

Actors:	Primary Actor: Student Secondary Actor: Institutional Database, Email Server
Trigger:	Students select the "Join Class" option on the BrainBee app..
Precondition:	PRE-1: Student has the BrainBee app installed PRE-2: Student possesses a valid class code from the teacher.
Postcondition:	POST-1: Student account is created and linked to the class. POST-2: Confirmation email is sent to the student.
Normal Flow	1. Student opens the app and selects "Join Class." 2. Student enters class code, email, and password. 3. System validates class code and email uniqueness. 4. Account is created, and student is enrolled in the class.
Alternative Flow	1. If the code is invalid, the system displays: "Invalid code. Try again." Students return to step 2.
Exceptions	The system detects an expired code and notifies the student.
Business Rules	BR-1: Class codes expire after 14 days. BR-2: Students must use institutional email domains.
Assumptions:	Teachers share class codes with students. Students have access to email.

UC-37: Register Account

Actors:	Primary: Parent Secondary: System, Email Server
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Trigger:	Parent selects the "Register" option on the BrainBee app.
Precondition:	PRE-1: Parent has the BrainBee app installed. PRE-2: Parent has a valid email address. PRE-3: Parent has a stable internet connection.
Postcondition:	POST-1: A new parent account is created and stored in the system's database. POST-2: A verification email is sent.
Normal Flow	<ol style="list-style-type: none"> 1. parents open the BrainBee app. 2. Parent selects "Register." 3. Parent enters: <ol style="list-style-type: none"> a. Full name b. Email address c. Password d. Phone number (optional) 4. Parent submits the registration form. 5. System validates: <ol style="list-style-type: none"> a. Email uniqueness (BR-1) b. Password strength (BR-2) 6. The system creates an account and sends a confirmation email. 7. Parents receive a success message.
Alternative Flow	<ol style="list-style-type: none"> 1.1 Duplicate Email <ol style="list-style-type: none"> 1. If the email is already registered, the system displays: "Email already exists. Log in or use another email." 2. Parent returns to step 3b of the Normal Flow. 1.2 Weak Password <ol style="list-style-type: none"> 1. If the password does not meet complex rules, the system displays: "Password must include 8+ characters, uppercase, and a number." 2. Parent returns to step 3c of the Normal Flow.
Exceptions	E1: Internet Connection Lost

	<ol style="list-style-type: none"> 1. The system detects loss of connectivity during registration. 2. System displays: "Connection lost. Please check your internet and try again." 3. Use case terminates.
Business Rules	BR-1: Email addresses must be unique. BR-2: Password must contain 8+ characters, 1 uppercase letter, and 1 number. BR-3: Confirmation emails must be sent within 2 minutes of registration.
Assumptions:	<ol style="list-style-type: none"> 1. Parents have access to a valid email inbox. 2. Parents understand password complexity requirements.

UC-38: Monitor Child's Progress

Actors:	Primary: Parent Secondary: System, Child Profile
Trigger:	Parent selects "View Child Progress" from the dashboard.
Precondition:	PRE-1: Parent is logged in. PRE-2: Child profile is linked to the parent account.
Postcondition:	POST-1: Parent can view child's academic performance. POST-2: Weekly and monthly reports are generated.
Normal Flow	<ol style="list-style-type: none"> 1. Parent navigates to the "Monitor Child" section. 2. Parent selects a specific child profile. 3. System displays: <ol style="list-style-type: none"> a. Report cards b. Quiz scores c. Leaderboard ranking d. Activity history 4. Parent can filter reports by date or subject.
Alternative Flow	None

Exceptions	E1: System Fails to Load Data 1. System detects an error fetching child data. 2. System displays: "Error retrieving data. Try again later."
Business Rules	BR-1: Progress reports must be updated in real-time.
Assumptions:	The child has participated in quizzes and assessments.

UC-39: Set Learning Goals for Child

Actors:	Primary: Parent Secondary: System, Child
Trigger:	Parent selects "Set Goals" from the parent dashboard.
Precondition:	PRE-1: Parent is logged in. PRE-2: Child profile is linked to the parent account.
Postcondition:	POST-1: A goal is created for the child. POST-2: System tracks goal completion progress.
Normal Flow	1. Parent navigates to the "Goals" module. 2. Parents select "Create New Goal." 3. Parent enters: a. Goal name (e.g., "Complete 5 quizzes this week") b. Target completion date c. Reward (optional, e.g., virtual coins) 4. Parent saves the goal. System tracks progress and updates completion status.
Alternative Flow	None
Exceptions	E1: System Fails to Save Goal System displays: "Error saving goal. Try again."
Business Rules	BR-1: Goals must have a target completion date
Assumptions:	Parents actively monitor and update goals.

UC-40: Authentication via Apple

Actors:	Primary Actor: User Secondary Actor: Apple Server
Trigger:	User chooses the option to log in using Apple credentials.
Preconditions:	PRE-1: User has a valid Apple ID account. PRE-2: User has navigated to the login page of the application.
Postconditions:	POST-1: User has been authenticated and granted access to the application. POST-2: User's Apple account is now linked with the application for future logins.
Normal Flow:	1.0 Login with Apple (see 1.0. E1) 1. User selects the option to log in with Apple. 2. The system redirects the user to Apple's authentication page. 3. User provides Apple ID credentials or skips if already logged in via Apple devices. 4. User grants permission to the application (if first-time login). 5. System logs the user in using their Apple credentials.
Alternative Flows:	N/A
Exceptions:	1.0. E1 Apple Authentication Failed 1. System informs the user that Apple authentication failed or was denied. 2a. If user decides to try logging in with Apple again, use case resumes at step 3 of the normal flow. 2b. Else if user decides not to retry and cancels, use case terminates.
Business Rules:	BR-1: Only registered users can log in to the application. BR-2: Users who have previously linked their Apple account with the application do not need to grant permission again; they will be logged in directly. BR-3: Apple authentication must comply with Apple's privacy and security standards, including optional email hiding.
Assumptions:	1. An active internet connection is available to the user. 2. Apple's Sign In with Apple service is available and operational.

3.2 Event Response Tables

3.2.1 Parent Receives Quiz Completion Notification ERT

Table 3.2.1: Event Response Table for Parent Receives Quiz Completion Notification

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
1	Parent receives quiz completion notification	Child's quiz results	Child completes quiz	Internet is not active	Queue notification for later delivery	Send real-time notification to parent	Notification displayed on parent dashboard

3.2.2 Teacher Receives Assignment Submission ERT

Table 3.2.2: Event Response Table for Teacher Receives Assignment Submission

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
2	Teacher receives assignment submission	Student assignment details	Student submits assignment	Internet is not active	Queue notification for later delivery	Send notification to teacher	Notification displayed on teacher dashboard

3.2.3 Internet Connection Lost ERT

Table 3.2.3: Event Response Table for Internet Connection Lost

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
3	Internet connection lost	Network status	App is running	No internet connection detected	Display offline mode, pause syncing	Do nothing	Offline mode interface displayed

3.2.4 Internet Connection Restored ERT

Table 3.2.4: Event Response Table for Internet Connection Restored

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
4	Internet connection restored	Network status	App in offline mode	Internet connection restored	Resume syncing, update data	Remain in offline mode	Dashboard updated with synced data

3.2.5 Weekly Report Generated ERT

Table 3.2.5: Event Response Table for Weekly Report Generated

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
5	Weekly report generated	Child performance data	Scheduled time reached	No data available	Log error, notify admin	Generate report, send to parent	Report sent, parent dashboard updated

3.2.6 Leaderboard Updated ERT

Table 3.2.6: Event Response Table for Leaderboard Updated

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
6	Leaderboard updated	Student scores	Daily update scheduled	No scores available	Skip update, log event	Recalculate rankings, update display	Leaderboard refreshed with new rankings

3.2.7 Goal Deadline Reached ERT

Table 3.2.7: Event Response Table for Goal Deadline Reached

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
7	Goal deadline reached	Goal details	Goal active	Goal not completed	Mark goal as incomplete, notify parent	Mark goal as complete, notify parent	Goal status updated on parent dashboard

3.2.8 Quiz Time Limit Expires ERT

Table 3.2.8: Event Response Table for Quiz Time Limit Expires

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
8	Quiz time limit expires	Quiz responses	Quiz active	Time elapsed	Submit quiz, calculate score, show results	Allow quiz to continue	Quiz results displayed to student

3.2.9 Assignment Deadline Passes ERT

Table 3.2.9: Event Response Table for Assignment Deadline Passes

ID	Event	Data Element	System State	Exception Condition	System Response In case of yes	System Response In case of no	System State Products Displayed
9	Assignment deadline passes	Assignment details	Assignment active	Deadline expired	Mark as late, notify teacher	Keep assignment open for submissions	Assignment status updated on teacher dashboard

4. Functional Requirements

4.1 UC-1: Register Account

4.1.1 FR-1: Account.Register

Identifier	FR-1
Title	Account.Register
Requirement	The user shall be able to register an account as Buyer and Seller or Admin in the application using the name, username, email address, phone number and password
Source	Nasir
Rationale	User must be registered to access the system
Business Rule	BR-1: Only one account can be registered for a given username. BR-2: Only one account can be registered for a given email id
Dependencies	FR-2, FR-3, FR-4
Priority	High

4.1.2 FR-2: Account.Validate

Identifier	FR-2
Title	Account.Validate
Requirement	When the user enters the username, the system shall be able to validate that the username and email is not already registered
Source	Nasir
Rationale	To ensure that the email id and username is not already registered
Business Rule	BR-1: Only one account can be registered for a given username. BR-2: Only one account can be registered for a given email id
Dependencies	FR-3, FR-4
Priority	High

4.1.3 FR-3: Account.Invalid.Username

Identifier	FR-3
Title	Account.Invalid.Username
Requirement	If the username is already registered, the system shall be able to display an error message that the username is already registered
Source	Nasir
Rationale	The user will know that the username is unavailable and enter a new username
Business Rule	BR-1: Only one account can be registered for a given username.
Dependencies	None
Priority	Medium

4.1.4 FR-4: Account.Invalid.Email

Identifier	FR-4
Title	Account.Invalid.Email
Requirement	If the email is already registered, the system shall be able to display an error message that the email is already registered
Source	Nasir
Rationale	The user will know that the email is already registered and enter a new email id
Business Rule	BR-1: Only one account can be registered for a given email Id
Dependencies	None
Priority	Medium

4.2 UC-2: Login

4.2.1 FR-5: Login.Information

Identifier	FR-5
Title	Login.Information
Requirement	The user shall be able to login the application using username and password
Source	Nasir

Rationale	The user can login to access the system
Business Rule	BR-1: Only registered user can login the application
Dependencies	FR-6
Priority	High

4.2.2 FR-6: Login.Information.Validate

Identifier	FR-6
Title	Login.Information.Validate
Requirement	When the user enters login information, the system shall be able to validate the username and password of the user
Source	Nasir
Rationale	System ensures that the information entered by the user is correct and in case of an unauthorized login attempt, the user is not allowed to access the system
Business Rule	BR-1: Only registered user can login the application
Dependencies	FR-7, FR-8
Priority	High

4.2.3 FR-7: Login.Information.Invalid

Identifier	FR-7
Title	Login.Information.Invalid
Requirement	If the login information is incorrect, the system shall be able to display a message that the login information is incorrect
Source	Nasir
Rationale	The user can recheck and reenter the information
Business Rule	BR-1: Only registered user can login the application
Dependencies	None
Priority	High

4.2.4 FR-8: Login.Information.Valid

Identifier	FR-8
Title	Login.Information.Valid
Requirement	If the login information is correct, the system shall be able to log in to the application and redirect the user to the application home page
Source	Nasir
Rationale	The user will get logged in to the account and can access the system
Business Rule	None
Dependencies	None
Priority	Medium

4.2.5 FR-9: Password.Reset

Identifier	FR-9
Title	Password.Reset
Requirement	The user shall be able to reset password using forgot password option on login screen if they do not remember their password
Source	Nasir
Rationale	The user can change the password using forgot password option if they do not remember the current password
Business Rule	None
Dependencies	FR-10
Priority	Medium

4.2.6 FR-10: Password.Reset.EmailInput

Identifier	FR-10
Title	Password.Reset.EmailInput
Requirement	The user shall be able to enter the email id of the account for which the password will be reset
Source	Nasir

Rationale	The user enters the email id so that recovery link is sent to relevant email address
Business Rule	BR-1: Only the registered email id will receive email to reset password
Dependencies	FR-11
Priority	Medium

4.2.7 FR-11: Password.Reset.Validate

Identifier	FR-11
Title	Password.Reset.Validate
Requirement	When the user enters the email id, the system shall be able to validate that the email id is correct
Source	Nasir
Rationale	Only registered email id can receive an email to reset password and the user will not be allowed to use another email id
Business Rule	BR-1: Only the registered email id will receive email to reset password
Dependencies	FR-12, FR-13
Priority	High

4.2.8 FR-12: Password.Reset.Invalid

Identifier	FR-12
Title	Password.Reset.Invalid
Requirement	If the email id to reset password is incorrect, the system shall be able to display a message that the email is incorrect
Source	Nasir
Rationale	The user will know that the email id is not registered and recheck and reenter the email id
Business Rule	BR-1: Only the registered email id will receive email to reset password
Dependencies	None
Priority	Medium

4.2.9 FR-13: Password.Reset.Information

Identifier	FR-13
Title	Password.Reset.Information
Requirement	The user shall be able to view reset password screen after opening the link from email
Source	Nasir
Rationale	The user can enter a new password on the reset password screen
Business Rule	None
Dependencies	FR-14
Priority	Medium

4.2.10 FR-14: Password.Reset.New

Identifier	FR-14
Title	Password.Reset.New
Requirement	The user shall be able to enter a new password and confirm new password for the account
Source	Nasir
Rationale	The new password will be used to login the account
Business Rule	None
Dependencies	FR-15
Priority	Medium

4.2.11 FR-15: Password.New.Validate

Identifier	FR-15
Title	Password.New.Validate
Requirement	The system shall be able to validate that the new password is strong and includes digits and alphabets
Source	Nasir
Rationale	The system will not allow a password that is not strong and without digits and alphabets

Business Rule	None
Dependencies	FR-16, FR-17
Priority	High

4.2.12 FR-16: Password.New.Valid

Identifier	FR-16
Title	Password.New.Valid
Requirement	If the new password is valid, the system shall be able to update the login information for the user
Source	Nasir
Rationale	The user can use this new password to login the account
Business Rule	BR-1: Only registered user can login the application
Dependencies	None
Priority	High

4.2.13 FR-17: Password.New.Invalid

Identifier	FR-17
Title	Password.New.Invalid
Requirement	If the new password is incorrect, the system shall be able to display a message to the user to reenter the password.
Source	Nasir
Rationale	The user reenters a new password that is a strong password with both digits and numbers
Business Rule	None
Dependencies	None
Priority	Medium

4.3 UC-3: Authentication via Google

4.3.1 FR-18: Login.Google.Option

Identifier	FR-18
Title	Login.Google.Option
Requirement	The user shall be able to select login by google option for login
Source	Nasir
Rationale	The use can select google option instead of username to login the application
Business Rule	BR-1: Only registered user can login the application
Dependencies	FR-19
Priority	High

4.3.2 FR-19: Login.Google.Information

Identifier	FR-19
Title	Login.Google.Information
Requirement	The user shall be able to select gmail account they want to login with if they select login by google option
Source	Nasir
Rationale	The user can add or select the gmail id so it can be checked by the system and account can be logged in using gmail credentials
Business Rule	BR-1: Only registered user can login the application
Dependencies	FR-20
Priority	High

4.3.3 FR-20: Login.Google.Information.Validate

Identifier	FR-20
Title	Login.Google.Information.Validate
Requirement	The user shall be able to access the application upon successful validation of their Google credentials.
Source	Nasir

Rationale	To provide the user access to the application upon successful credential validation.
Business Rule	BR-1: Only registered user can login the application BR-1: Users who have previously linked their Google account with the application don't need to grant permission again, they will be logged in directly.
Dependencies	None
Priority	High

4.4 UC-4: Edit Profile

4.4.1 FR-21: Profile.Edit

Identifier	FR-21
Title	Profile.Edit
Requirement	The user shall be able to update the phone number, username, profile picture, password and confirm password for the account
Source	Nasir
Rationale	The users can add any updated information to the profile or change the password or username if they want to
Business Rule	BR-1: Only one account can be registered for a given username
Dependencies	FR-22, FR-24
Priority	Medium

4.4.2 FR-22: Profile.Username.Validate

Identifier	FR-22
Title	Profile.Username.Validate
Requirement	If user changes the username, the system shall be able to validate that the username is available
Source	Nasir
Rationale	To ensure that the username selected by the user is not already in use
Business Rule	BR-1: Only one account can be registered for a given username
Dependencies	FR-23, FR-29

Priority	High
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4.4.3 FR-23: Profile.Username.Invalid

Identifier	FR-23
Title	Profile.Username.Invalid
Requirement	If the username is not available, the system shall be able to display a message to the user that the username is not available
Source	Nasir
Rationale	The user can know that the username is already in use and reenter a new username
Business Rule	BR-1: Only one account can be registered for a given username
Dependencies	None
Priority	Medium

4.4.4 FR-24: Profile.Password.Validate

Identifier	FR-24
Title	Profile.Password.Validate
Requirement	The system shall be able to validate the updated password entered by the user
Source	Nasir
Rationale	The system will validate that the password is strong with both digits and alphabets
Business Rule	BR-1: The password must be a strong password with both alphabets and digits
Dependencies	FR-25, FR-29
Priority	High

4.4.5 FR-25: Profile.Password.Invalid

Identifier	FR-25
Title	Profile.Password.Invalid

Requirement	If the updated password is invalid, the system shall be able to display a message to the user to enter a password a strong password with both alphabets and digits
Source	Nasir
Rationale	The user will know that the password format is invalid and enter a new password
Business Rule	BR-1: The password must be a strong password with both alphabets and digits
Dependencies	None
Priority	Medium

4.4.6 FR-26: Profile.Password.Confirm

Identifier	FR-26
Title	Profile.Password.Confirm
Requirement	The user shall be able to confirm password if they want to update it
Source	Nasir
Rationale	The user will enter the password again to make sure there are no typing mistakes
Business Rule	BR-1: The password must be a strong password with both alphabets and digits
Dependencies	FR-27
Priority	High

4.4.7 FR-27: Profile.Password.Confirm.Validate

Identifier	FR-27
Title	Profile.Password.Confirm.Validate
Requirement	If the user confirms password, the system shall be able to validate that the password and confirmed password are the same
Source	Nasir
Rationale	The system will check that both password and confirm password are same to make sure there is no typing mistake by the user

Business Rule	BR-1: The password must be a strong password with both alphabets and digits
Dependencies	FR-28, FR-29
Priority	High

4.4.8 FR-28: Profile.Password.Confirm.Invalid

Identifier	FR-28
Title	Profile.Password.Confirm.Invalid
Requirement	If the confirmed password is not the same, the system shall be able to display a message to recheck the entered passwords
Source	Nasir
Rationale	The user will know that there is a typing mistake and recheck the entered password
Business Rule	None
Dependencies	None
Priority	Medium

4.4.9 FR-29: Profile.Information.Update

Identifier	FR-29
Title	Profile.Information.Update
Requirement	If the updated information entered by the user is valid, the system shall be able to update the information for the user
Source	Nasir
Rationale	The updated information will be used by the user to login and use the profile
Business Rule	None
Dependencies	None
Priority	High

4.5 UC-5: Logout

4.5.1 FR-30: Account.Logout

Identifier	FR-30
Title	Account.Logout
Requirement	The user shall be able to select logout option if they want to close account on a device and have logged in with the account
Source	Nasir
Rationale	The user can logout the account if no longer to be used
Business Rule	None
Dependencies	FR-31
Priority	Medium

4.5.2 FR-31: Account.Logout.Confirmation

Identifier	FR-31
Title	Account.Logout.Confirmation
Requirement	If the user selects logout option, the system shall be able to display a confirmation message that “Are you sure you want to logout?”
Source	Nasir
Rationale	The user will know that the account will be logged out.
Business Rule	None
Dependencies	FR-32, FR-33
Priority	High

4.5.3 FR-32: Account.Logout.Confirm

Identifier	FR-32
Title	Account.Logout.Confirm
Requirement	The user shall be able to confirm account logging out after reading the confirmation message
Source	Nasir

Rationale	The user will read the confirmation message and if they confirm, it means that they want the account to be logged out.
Business Rule	None
Dependencies	FR-34
Priority	Medium

4.5.4 FR-33: Account.Logout.Cancel

Identifier	FR-33
Title	Account.Logout.Cancel
Requirement	The user shall be able to cancel account logging out if they do not want account to be logged out
Source	Nasir
Rationale	If account logging out is cancelled, the system will not logout the account
Business Rule	None
Dependencies	None
Priority	Medium

4.5.5 FR-34: Account.Logout.Internet

Identifier	FR-34
Title	Account.Logout.Internet
Requirement	If the user confirms account logging out and there is no active internet connection, the system shall be able to display a message that the account cannot be logged out without internet
Source	Nasir
Rationale	The user's device will have to communicate with a server and if there is no internet connection, it will not be possible and hence, the account will not be logged out
Business Rule	None
Dependencies	None
Priority	Low

4.5.6 FR-30: Account.Logout

Identifier	FR-30
Title	Account.Logout
Requirement	The user shall be able to select logout option if they want to close account on a device and have logged in with the account
Source	Nasir
Rationale	The user can logout the account if no longer to be used
Business Rule	None
Dependencies	FR-31
Priority	Medium

4.5.7 FR-31: Account.Logout.Confirmation

Identifier	FR-31
Title	Account.Logout.Confirmation
Requirement	If the user selects logout option, the system shall be able to display a confirmation message that “Are you sure you want to logout?”
Source	Nasir
Rationale	The user will know that the account will be logged out.
Business Rule	None
Dependencies	FR-32, FR-33
Priority	High

4.5.8 FR-32: Account.Logout.Confirm

Identifier	FR-32
Title	Account.Logout.Confirm
Requirement	The user shall be able to confirm account logging out after reading the confirmation message
Source	Nasir

Rationale	The user will read the confirmation message and if they confirm, it means that they want the account to be logged out.
Business Rule	None
Dependencies	FR-34
Priority	Medium

4.5.9 FR-33: Account.Logout.Cancel

Identifier	FR-33
Title	Account.Logout.Cancel
Requirement	The user shall be able to cancel account logging out if they do not want account to be logged out
Source	Nasir
Rationale	If account logging out is cancelled, the system will not logout the account
Business Rule	None
Dependencies	None
Priority	Medium

4.5.10 FR-34: Account.Logout.Internet

Identifier	FR-34
Title	Account.Logout.Internet
Requirement	If the user confirms account logging out and there is no active internet connection, the system shall be able to display a message that the account cannot be logged out without internet
Source	Nasir
Rationale	The user's device will have to communicate with a server and if there is no internet connection, it will not be possible and hence, the account will not be logged out
Business Rule	None
Dependencies	None
Priority	Low

4.6 UC-6: Delete Account

4.6.1 FR-35: AccountDeletion.Initiation

Identifier	FR-35
Title	AccountDeletion.Initiation
Requirement	The system shall allow a logged-in user to initiate the account deletion process by selecting the "Delete Account" option in the Account Settings.
Source	Nasir
Rationale	To provide users with the ability to start the account deletion process from their account settings.
Business Rule	BR-1: Only logged-in users can initiate account deletion.
Dependencies	PRE-1: The user must be logged into their account.
Priority	High

4.6.2 FR-36: AccountDeletion.Confirmation

Identifier	FR-36
Title	AccountDeletion.Confirmation
Requirement	The system shall display a confirmation message explaining the consequences of account deletion when the user selects the "Delete Account" option.
Source	Nasir
Rationale	To ensure the user understands the permanent nature of account deletion before proceeding.
Business Rule	BR-2: The system must warn users about the irreversible consequences of account deletion.
Dependencies	FR-35 (Account Deletion Initiation)
Priority	High

4.6.3 FR-37: AccountDeletion.Authentication

Identifier	FR-37
Title	AccountDeletion.Authentication
Requirement	The system shall require the user to provide authentication details (e.g., password or OTP) to confirm their identity before proceeding with account deletion.
Source	Nasir
Rationale	To ensure that only the account owner can delete the account and prevent unauthorized deletions.
Business Rule	BR-3: Authentication is mandatory for account deletion.
Dependencies	FR-36 (Account Deletion Confirmation)
Priority	High

4.6.4 FR-38: AccountDeletion.Execution

Identifier	FR-38
Title	AccountDeletion.Execution
Requirement	The system shall permanently delete the user's account and all associated data upon successful authentication.
Source	Nasir
Rationale	To ensure that the account and its data are completely removed from the system as per the user's request.
Business Rule	BR-4: A deleted account and its data cannot be recovered unless a temporary deactivation period is supported.
Dependencies	FR-37 (Account Deletion Authentication)
Priority	High

4.6.5 FR-39: AccountDeletion.Notification

Identifier	FR-39
Title	AccountDeletion.Notification
Requirement	The system shall display a confirmation message and redirect the user to the login or welcome screen after successful account deletion.
Source	Nasir
Rationale	To inform the user that their account has been successfully deleted and guide them to the appropriate screen.
Business Rule	BR-5: Users must be notified of successful account deletion and redirected to a non-restricted page.
Dependencies	FR-38 (Account Deletion Execution)
Priority	Medium

4.6.6 FR-40: AccountDeletion.Cancellation

Identifier	FR-40
Title	AccountDeletion.Cancellation
Requirement	The system shall allow the user to cancel the account deletion process at any point before providing authentication details.
Source	Nasir
Rationale	To provide users with the flexibility to abort the deletion process if they change their mind.
Business Rule	BR-6: Users can cancel the deletion process before authentication.
Dependencies	FR-35 (Account Deletion Initiation)
Priority	Medium

4.6.7 FR-41: AccountDeletion.Authentication.Failure

Identifier	FR-41
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Title	AccountDeletion.Authentication.Failure
Requirement	The system shall display an error message and allow the user to retry authentication if incorrect details are provided during the account deletion process.
Source	Nasir
Rationale	To handle authentication failures gracefully and provide the user with an opportunity to correct their input.
Business Rule	BR-7: Users are allowed a limited number of retries for authentication before the process is temporarily locked.
Dependencies	FR-37 (Account Deletion Authentication)
Priority	Medium

4.6.8 FR-42: AccountDeletion.SystemError

Identifier	FR-42
Title	AccountDeletion.SystemError
Requirement	The system shall display an error message and log the issue for administrators if an unexpected system error occurs during the account deletion process.
Source	Nasir
Rationale	To handle system errors gracefully and ensure administrators are aware of technical issues.
Business Rule	BR-8: System errors during account deletion must be logged and reported to administrators.
Dependencies	FR-38 (Account Deletion Execution)
Priority	Low

4.7 UC-7: Switch Roles

4.7.1 FR-43: RoleSwitch.Initiation

Identifier	FR-43
Title	RoleSwitch.Initiation
Requirement	The system shall allow a logged-in user to initiate the role-switching process by selecting the "Switch User" option from the Account Settings or Profile Menu.
Source	Nasir
Rationale	To provide users with the ability to switch between their available roles (e.g., Teacher, Student, Parent).
Business Rule	BR-1: Only logged-in users can initiate role switching.
Dependencies	PRE-1: The user must be logged into the application.
Priority	High

4.7.2 FR-44: RoleSwitch.RoleList

Identifier	FR-44
Title	RoleSwitch.RoleList
Requirement	The system shall display a list of available roles (e.g., Teacher, Student, Parent) that the user can switch to when the "Switch User" option is selected.
Source	Nasir
Rationale	To ensure the user can view and select from their available roles.
Business Rule	BR-2: The system must only display roles the user is authorized to switch to.
Dependencies	FR-43
Priority	High

4.7.3 FR-45: RoleSwitch.Authentication

Identifier	FR-45
Title	RoleSwitch.Authentication
Requirement	The system shall prompt the user to provide authentication details (e.g., password or biometric authentication) before switching roles.
Source	Nasir
Rationale	To ensure that only authorized users can switch roles and prevent unauthorized access.
Business Rule	BR-3: Authentication is mandatory for role switching.
Dependencies	FR-44
Priority	High

4.7.4 FR-46: RoleSwitch.Execution

Identifier	FR-46
Title	RoleSwitch.Execution
Requirement	The system shall switch the user to the selected role upon successful authentication and update the user interface and permissions accordingly.
Source	Nasir
Rationale	To ensure the user's role, permissions, and interface are updated correctly after switching.
Business Rule	BR-4: The system must update the user interface and permissions based on the new role.
Dependencies	FR-45
Priority	High

4.7.5 FR-47: RoleSwitch.Confirmation

Identifier	FR-47
Title	RoleSwitch.Confirmation

Requirement	The system shall display a confirmation message indicating that the role switch was successful.
Source	Nasir
Rationale	To inform the user that the role switch has been completed successfully.
Business Rule	BR-5: Users must be notified of successful role switching.
Dependencies	FR-46
Priority	Medium

4.7.6 FR-48: RoleSwitch.Cancellation

Identifier	FR-48
Title	RoleSwitch.Cancellation
Requirement	The system shall allow the user to cancel the role-switching process at any point before providing authentication details.
Source	Nasir
Rationale	To provide users with the flexibility to abort the role-switching process if they change their mind.
Business Rule	BR-6: Users can cancel the role-switching process before authentication.
Dependencies	FR-43
Priority	Medium

4.7.7 FR-49: RoleSwitch.NoRolesAvailable

Identifier	FR-49
Title	RoleSwitch.NoRolesAvailable
Requirement	If the user has no other roles available, the system shall display a message prompting the user to create a new role and redirect them to the Role Creation process if they choose to proceed.
Source	Nasir
Rationale	To guide users who have no other roles to create a new role if eligible.
Business Rule	BR-7: Users with no other roles must be given the option to create a new role (if eligible).
Dependencies	FR-44
Priority	Medium

4.7.8 FR-50: RoleSwitch.AuthenticationFailure

Identifier	FR-50
Title	RoleSwitch.AuthenticationFailure

Requirement	The system shall display an error message and allow the user to retry authentication if incorrect details are provided during the role-switching process.
Source	Nasir
Rationale	To handle authentication failures gracefully and provide the user with an opportunity to correct their input.
Business Rule	BR-8: Users are allowed a limited number of retries for authentication before the process is temporarily locked.
Dependencies	FR-45
Priority	Medium

4.7.9 FR-51: RoleSwitch.SystemError

Identifier	FR-51
Title	Role.Switch.System.Error
Requirement	The system shall display an error message and log the issue for administrators if an unexpected system error occurs during the role-switching process.
Source	Nasir
Rationale	To handle system errors gracefully and ensure administrators are aware of technical issues.
Business Rule	BR-9: System errors during role switching must be logged and reported to administrators.
Dependencies	FR-46
Priority	Low

4.8 UC-8: Generate Summary/Explanation

4.8.1 FR-52: SummaryGeneration.Initiation

Identifier	FR-52
Title	Summary.Generation.Initiation
Requirement	The system shall allow a user to initiate the generation of a summary or explanation by selecting the 'Generate Summary' or 'Explain Topic' option for a specific book or topic.
Source	Nasir
Rationale	To provide users with the ability to request AI-generated summaries or explanations for selected topics.
Business Rule	BR-1: Users must have access to the learning module and select a valid book/topic.
Dependencies	PRE-1: User has access to the learning module. PRE-2: User selects a book and a specific topic/chapter.
Priority	High

4.8.2 FR-53: SummaryGeneration.AIProcessing

Identifier	FR-53
Title	Summary.Generation.AI.Processing
Requirement	The system shall process the selected topic using AI-based text analysis to generate a personalized summary or detailed explanation.
Source	Nasir
Rationale	To ensure the AI system generates accurate and relevant summaries or explanations for the selected topic.
Business Rule	BR-2: AI-generated summaries should be concise, structured, and easy to understand.
Dependencies	FR-52
Priority	High

4.8.3 FR-54: SummaryGeneration.Output

Identifier	FR-54
Title	SummaryGeneration.Output
Requirement	The system shall present the AI-generated summary or explanation in a readable and structured format.
Source	Nasir
Rationale	To ensure the user receives a clear and understandable output.
Business Rule	BR-3: The system should prioritize accuracy and readability when generating explanations.
Dependencies	FR-53
Priority	High

4.8.4 FR-55: SummaryGeneration. AdditionalDetail

Identifier	FR-55
Title	SummaryGeneration.AdditionalDetail
Requirement	The system shall allow the user to request a more in-depth explanation if the initial summary is insufficient.
Source	Nasir
Rationale	To provide users with the flexibility to obtain more detailed explanations when needed.
Business Rule	BR-4: Users can request additional details for summaries or explanations.
Dependencies	FR-54
Priority	Medium

4.8.5 FR-56: S SummaryGenerationFormatCustomization

Identifier	FR-56
Title	Summary.Generation.Format.Customization
Requirement	The system shall allow the user to request the summary in different formats (e.g., bullet points, paragraph, key takeaways).
Source	Nasir
Rationale	To provide users with the ability to customize the format of the summary based on their preferences.
Business Rule	BR-5: Users can request summaries in multiple formats.
Dependencies	FR-54
Priority	Medium

4.8.6 FR-57: SummaryGeneration.AIError

Identifier	FR-57
Title	SummaryGeneration.AIError
Requirement	The system shall display an error message if the AI fails to generate a summary or explanation and allow the user to retry or report the issue.
Source	Nasir
Rationale	To handle AI processing errors gracefully and provide the user with options to resolve the issue.
Business Rule	BR-7: The system must handle AI processing errors and notify the user.
Dependencies	N/A
Priority	Medium

4.8.7 FR-58: SummaryGeneration.InternetError

Identifier	FR-58
Title	SummaryGeneration.InternetError
Requirement	The system shall display an error message if the internet connection is unstable and advise the user to reconnect and retry.
Source	Nasir
Rationale	To handle internet connectivity issues gracefully and ensure the user can retry the process.
Business Rule	BR-8: The system must handle internet connectivity issues and notify the user.
Dependencies	N/A
Priority	Medium

4.9 UC-9: Generate Quiz

4.9.1 FR-59: QuizGeneration.Initiation

Identifier	FR-59
Title	QuizGeneration.Initiation
Requirement	The system shall allow a student to initiate the quiz generation process by selecting the 'Take AI Quiz' option and choosing a book, chapter, or topic.
Source	Nasir
Rationale	To provide students with the ability to request AI-generated quizzes for selected content.
Business Rule	BR-1: The student must be logged into the system and select valid content.
Dependencies	N/A
Priority	High

4.9.2 FR-60: Quiz.Generation.Content.Selection

Identifier	FR-60
Title	Quiz.Generation.Content.Selection
Requirement	The system shall prompt the student to select a book, chapter, or specific topic for quiz generation.
Source	Nasir
Rationale	To ensure the student can specify the content for which the quiz will be generated.
Business Rule	BR-2: The system must allow selection of a book, chapter, or specific topic.
Dependencies	FR-59
Priority	High

4.9.3 FR-61: QuizGeneration.AIProcessing

Identifier	FR-61
Title	QuizGeneration.AIProcessing
Requirement	The system shall process the selected content using AI to generate a quiz with relevant questions.
Source	Nasir
Rationale	To ensure the AI system generates accurate and relevant quiz questions based on the selected content.
Business Rule	BR-3: The AI must generate questions that are relevant to the selected content.
Dependencies	FR-60
Priority	High

4.9.4 FR-62: QuizGeneration.Output

Identifier	FR-62
Title	QuizGeneration.Output
Requirement	The system shall display a 'Quiz Ready' message and redirect the student to the quiz interface upon successful quiz generation.
Source	Nasir
Rationale	To inform the student that the quiz is ready and allow them to start the quiz.
Business Rule	BR-4: The system must notify the student when the quiz is ready.
Dependencies	FR-61
Priority	High

4.9.5 FR-63: QuizGeneration.Cancellation

Identifier	FR-63
Title	QuizGeneration.Cancellation
Requirement	The system shall allow the student to cancel the quiz generation process at any point before the quiz is generated.
Source	Nasir
Rationale	To provide students with the flexibility to abort the quiz generation process if they change their mind.
Business Rule	BR-5: Students can cancel quiz generation before the quiz is generated.
Dependencies	FR-59
Priority	Medium

4.9.6 FR-64: QuizGeneration.TopicSelection

Identifier	FR-64
Title	QuizGeneration.TopicSelection
Requirement	The system shall allow the student to select a specific topic within a chapter for quiz generation instead of the entire chapter.
Source	Nasir
Rationale	To provide students with the ability to generate quizzes for specific topics of interest.
Business Rule	BR-6: The system must support quiz generation for specific topics within a chapter.
Dependencies	FR-60
Priority	Medium

4.9.7 FR-65: QuizGeneration.ALError

Identifier	FR-65
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Title	Quiz.Generation.ALError
Requirement	The system shall display an error message if the AI fails to generate a quiz due to network failure, server issues, or unexpected system errors.
Source	Nasir
Rationale	To handle AI processing errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-7: The system must handle AI processing errors and notify the student.
Dependencies	N/A
Priority	Medium

4.10 UC-10: Take Quiz

4.10.1 FR-66: TakeQuiz.Initiation

Identifier	FR-66
Title	TakeQuiz.Initiation
Requirement	The system shall allow the student to start the quiz by selecting the 'Start Quiz' option from the quiz interface.
Source	Nasir
Rationale	To provide students with the ability to begin the quiz once it is generated.
Business Rule	BR-1: The quiz must present one question at a time for user interaction.
Dependencies	N/A
Priority	High

4.10.2 FR-67: TakeQuiz.Display

Identifier	FR-67
Title	TakeQuiz.Display
Requirement	The system shall display one quiz question at a time to the student.
Source	Nasir
Rationale	To ensure the student can focus on one question at a time and interact with it effectively.
Business Rule	BR-1: The quiz must present one question at a time for user interaction.
Dependencies	FR-66
Priority	High

4.10.3 FR-68: TakeQuiz.AnswerSubmission

Identifier	FR-68
Title	TakeQuiz.AnswerSubmission

Requirement	The system shall allow the student to select an answer for the current question and submit it.
Source	Nasir
Rationale	To ensure the student can provide answers to the quiz questions.
Business Rule	BR-2: A user should not be able to skip a question without selecting an answer.
Dependencies	FR-67
Priority	High

4.10.4 FR-69: TakeQuiz.AnswerRecording

Identifier	FR-69
Title	QuizAnswer.Recording
Requirement	The system shall record the student's answer for each question and proceed to the next question upon submission.
Source	Nasir
Rationale	To ensure the student's responses are stored for further processing and evaluation.
Business Rule	BR-2: A user should not be able to skip a question without selecting an answer.
Dependencies	FR-68
Priority	High

4.10.5 FR-70: TakeQuiz.Completion

Identifier	FR-70
Title	TakeQuiz.Completion
Requirement	The system shall display a quiz summary screen once the student has answered all questions.
Source	Nasir
Rationale	To inform the student that the quiz is complete and provide a summary of their responses.
Business Rule	BR-1: The quiz must present one question at a time for user interaction.
Dependencies	FR-69
Priority	High

4.10.6 FR-71: TakeQuiz.ExitBeforeCompletion

Identifier	FR-71
Title	TakeQuiz.ExitBeforeCompletion

Requirement	The system shall allow the student to exit the quiz before completing all questions.
Source	Nasir
Rationale	To provide students with the flexibility to exit the quiz if needed.
Business Rule	BR-2: A user should not be able to skip a question without selecting an answer.
Dependencies	FR-66
Priority	Medium

4.10.7 FR-72: TakeQuiz.SummaryDisplay

Identifier	FR-72
Title	TakeQuiz.SummaryDisplay
Requirement	The system shall display a summary of correct and incorrect answers upon quiz completion.
Source	Nasir
Rationale	To provide the student with immediate feedback on their performance.
Business Rule	BR-1: The quiz must present one question at a time for user interaction.
Dependencies	PRE-1: The student must have completed at least one question.
Priority	High

4.10.8 FR-73: TakeQuiz.ReportGeneration

Identifier	FR-73
Title	TakeQuiz.ReportGeneration
Requirement	The system shall generate a detailed report of the quiz results if requested by the student.
Source	Nasir
Rationale	To provide the student with a comprehensive analysis of their quiz performance.
Business Rule	BR-2: A user should not be able to skip a question without selecting an answer.
Dependencies	FR-72
Priority	Medium

4.11 UC-11: Flashcard Generation

4.11.1 FR-74: FlashcardsGeneration.Initiation

Identifier	FR-74
Title	FlashcardsGeneration.Initiation
Requirement	The system shall allow a student to initiate the flashcard generation process by selecting the 'Generate Flashcards' option.
Source	Nasir
Rationale	To provide students with the ability to request personalized flashcards for a specific chapter or topic.
Business Rule	BR-1: The AI Engine must generate flashcards based on the most relevant and important content.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has access to the chapter or topic they want to study.
Priority	High

4.11.2 FR-75: FlashcardsGeneration.Chapter/TopicSelection

Identifier	FR-75
Title	FlashcardsGeneration.Chapter/TopicSelection
Requirement	The system shall prompt the student to select a specific chapter or topic from the available list for flashcard generation.
Source	Nasir
Rationale	To ensure the student can specify the content for which flashcards will be generated.
Business Rule	BR-1: The AI Engine must generate flashcards based on the most relevant and important content.
Dependencies	FR-74
Priority	High

4.11.3 FR-76: FlashcardsGeneration.PreferencesSpecification

Identifier	FR-76
Title	FlashcardsGeneration.PreferencesSpecification
Requirement	The system shall allow the student to specify additional preferences (e.g., difficulty level, number of flashcards) for flashcard generation.
Source	Nasir
Rationale	To provide students with the ability to customize the flashcards according to their needs.
Business Rule	BR-2: Flashcards should be personalized according to the student's preferences and past performance.
Dependencies	FR-75
Priority	Medium

4.11.4 FR-77: FlashcardsGeneration.Generate

Identifier	FR-77
Title	FlashcardsGeneration.Generate
Requirement	The system shall use the AI Engine to analyze the selected chapter or topic and generate personalized flashcards based on the student's preferences.
Source	Nasir
Rationale	To ensure the flashcards are relevant, accurate, and tailored to the student's needs.
Business Rule	BR-1: The AI Engine must generate flashcards based on the most relevant and important content.
Dependencies	FR-76
Priority	High

4.11.5 FR-78: FlashcardsGeneration.Display

Identifier	FR-78
Title	FlashcardsGeneration.Display
Requirement	The system shall display the generated flashcards to the student for review.
Source	Nasir
Rationale	To allow the student to review the flashcards before saving or editing them.
Business Rule	BR-2: Flashcards should be personalized according to the student's preferences and past performance.
Dependencies	FR-77
Priority	High

4.11.6 FR-79: FlashcardsGeneration.AIError

Identifier	FR-79
Title	FlashcardsGeneration.AIError
Requirement	The system shall display an error message if the AI Engine fails to generate flashcards and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle AI processing errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The AI Engine must generate flashcards based on the most relevant and important content.
Dependencies	76
Priority	Medium

4.12 UC-12: Peer Competition

4.12.1 FR-80: Competition.Initiation

Identifier	FR-80
Title	Competition.Initiation
Requirement	The system shall allow a student to initiate a battle by selecting the 'Initiate Battle' option.
Source	Nasir
Rationale	To provide students with the ability to start a battle with friends or random opponents.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has access to the battle feature.
Priority	High

4.12.2 FR-81: Competition.FriendInvitation

Identifier	FR-81
Title	Competition.FriendInvitation
Requirement	The system shall allow the student to invite friends from their friend list to participate in the battle.
Source	Nasir
Rationale	To enable students to challenge their friends in a battle.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	FR-80
Priority	High

4.12.3 FR-82: Competition.FriendSelection

Identifier	FR-82
Title	Competition.FriendSelection
Requirement	The system shall allow the student to select friends from their friend list to invite to the battle.
Source	Nasir
Rationale	To ensure the student can choose specific friends to challenge.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	FR-81
Priority	High

4.12.4 FR-83: Competition.Initiation.Confirmation

Identifier	FR-83
Title	Competition.Initiation.Confirmation
Requirement	The system shall initiate the battle and proceed to generate a quiz once the student has selected friends or opted for random matchmaking.
Source	Nasir
Rationale	To ensure the battle starts smoothly and transitions to the quiz generation phase.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	FR82
Priority	High

4.12.5 FR-84: Competition.NoFriendsAvailable

Identifier	FR-84
Title	Competition.NoFriendsAvailable
Requirement	The system shall inform the student if no friends are available and suggest random matchmaking.
Source	Nasir
Rationale	To handle cases where the student has no friends available for a battle.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	FR-81
Priority	Medium

4.12.6 FR-85: Competition.Initiation.Failure

Identifier	FR-85
Title	Competition.Initiation.Failure
Requirement	The system shall display an error message if the battle initiation fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle battle initiation errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The student can only invite friends who are currently online and available.
Dependencies	FR-83
Priority	Medium

4.13 UC-13: Generate Battle Report Card

4.13.1 FR-86: ReportCardGeneration.Initiation

Identifier	FR-86
Title	ReportCardGeneration.Initiation
Requirement	The system shall generate a report card after the completion of a battle.
Source	Nasir
Rationale	To provide the student with a detailed summary of their performance in the battle.
Business Rule	BR-1: The battle history must include details of each battle, including opponents and results.
Dependencies	PRE-1: The battle has been completed.
Priority	High

4.13.2 FR-87: ReportCardGeneration.Initiation

Identifier	FR-87
Title	ReportCardGeneration.Calculation
Requirement	The system shall calculate the results of the battle, including scores, accuracy, and performance metrics.
Source	Nasir
Rationale	To ensure the report card accurately reflects the student's performance.
Business Rule	BR-1: The battle history must include details of each battle, including opponents and results.
Dependencies	FR-86
Priority	High

4.13.3 FR-88: ReportCardGeneration.Generate

Identifier	FR-88
Title	ReportCardGeneration.Generate
Requirement	The system shall generate a report card detailing the student's performance, including battle results, rankings, and improvement suggestions.
Source	Nasir
Rationale	To provide the student with a comprehensive summary of their battle performance.
Business Rule	BR-1: The battle history must include details of each battle, including opponents and results.
Dependencies	FR-87
Priority	High

4.13.4 FR-89: ReportCardGeneration.Display

Identifier	FR-89
Title	ReportCardGeneration.Display
Requirement	The system shall present the generated report card to the student for review.
Source	Nasir
Rationale	To allow the student to view their performance summary.
Business Rule	BR-1: The battle history must include details of each battle, including opponents and results.
Dependencies	FR-88
Priority	High

4.14 UC-14: View Battle History

4.14.1 FR-90: ViewBattleHistory.Initiation

Identifier	FR-90
Title	ViewBattleHistory.Initiation
Requirement	The system shall allow a student to view their battle history by selecting the 'View Battle History' option.
Source	Nasir
Rationale	To provide students with access to their past battle records for review and analysis.
Business Rule	BR-1: The report card must include detailed performance metrics and comparisons with the opponent(s).
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has participated in at least one battle.
Priority	High

4.14.2 FR-91: ViewBattleHistory.Retrieval

Identifier	FR-91
Title	ViewBattleHistory.Retrieval
Requirement	The system shall retrieve and display the student's battle history, including details of each battle (e.g., opponents, results, and report cards).
Source	Nasir
Rationale	To ensure the student can review their past battles and performance metrics.
Business Rule	BR-1: The report card must include detailed performance metrics and comparisons with the opponent(s).
Dependencies	FR-90
Priority	High

4.14.3 FR-92: ViewBattleHistory.Display

Identifier	FR-92
Title	ViewBattleHistory.Display
Requirement	The system shall display the retrieved battle history in a structured and readable format, including results and report cards for each battle.
Source	Nasir
Rationale	To provide the student with a clear and comprehensive view of their battle history.
Business Rule	BR-1: The report card must include detailed performance metrics and comparisons with the opponent(s).
Dependencies	FR-91
Priority	High

4.15 UC-15: View Competitor's Profiles

4.15.1 FR-93: ViewCompetitor'sProfile.Initiation

Identifier	FR-93
Title	ViewCompetitor'sProfile.Initiation
Requirement	The system shall allow a student to view a competitor's profile by selecting the competitor from their battle history or current battle.
Source	Nasir
Rationale	To provide students with the ability to review the profiles of their competitors for insights and analysis.
Business Rule	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has participated in a battle with the competitor.
Priority	High

4.15.2 FR-93: ViewCompetitor'sProfile.Retrieval

Identifier	FR-93
Title	ViewCompetitor'sProfile.Retrieval
Requirement	The system shall retrieve and display the competitor's profile, including details such as past performance, statistics, and battle history.
Source	Nasir
Rationale	To ensure the student can access comprehensive information about the competitor.
Business Rule	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Dependencies	FR-92
Priority	High

4.15.3 FR-94: ViewCompetitor'sProfile.Display

Identifier	FR-94
Title	ViewCompetitor'sProfile.Display
Requirement	The system shall display the competitor's profile in a structured and readable format, including performance metrics and battle history.
Source	Nasir
Rationale	To provide the student with a clear and comprehensive view of the competitor's profile.
Business Rule	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Dependencies	FR-93
Priority	High

4.15.4 FR-95: ViewCompetitor'sProfile.ProfileNotAvailable

Identifier	FR-95
Title	ViewCompetitor'sProfile.ProfileNotAvailable
Requirement	The system shall inform the student if the competitor's profile is not available and terminate the process.
Source	Nasir
Rationale	To handle cases where the competitor's profile cannot be retrieved.
Business Rule	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Dependencies	FR-93
Priority	Medium

4.15.5 FR-96: ViewCompetitor'sProfile.Display

Identifier	FR-96
Title	ViewCompetitor'sProfile.RetrievalFailure
Requirement	The system shall display an error message if the competitor's profile retrieval fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle profile retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The competitor's profile must include relevant details such as performance metrics and battle history.
Dependencies	FR-93
Priority	Medium

4.16 UC-16: Access Class

4.16.1 FR-97: ClassAccess.Initiation

Identifier	FR-97
Title	ClassAccess.Initiation
Requirement	The system shall allow a student to access their enrolled classes by selecting the "Access Class" option.
Source	Nasir
Rationale	To provide students with the ability to view and interact with their enrolled classes.
Business Rule	BR-1: Only enrolled classes should be displayed to the student.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student is enrolled in at least one class.
Priority	High

4.16.2 FR-98: ClassAccess.ClassListRetrieval

Identifier	FR-98
Title	ClassAccess.ClassListRetrieval
Requirement	The system shall retrieve and display the list of classes the student is enrolled in.
Source	Nasir
Rationale	To ensure the student can view all their enrolled classes in one place.
Business Rule	BR-1: Only enrolled classes should be displayed to the student.
Dependencies	FR-97
Priority	High

4.16.3 FR-99: ClassAccess.ClassListRetrieval

Identifier	FR-99
Title	ClassAccess.ClassDetailView
Requirement	The system shall allow the student to select a class from the list and view in details.
Source	Nasir
Rationale	To provide the student with detailed information about a specific class.
Business Rule	BR-1: Only enrolled classes should be displayed to the student.
Dependencies	FR-98
Priority	High

4.16.4 FR-100: ClassAccess.NoClassesToShow

Identifier	FR-100
Title	ClassAccess.NoClassesToShow
Requirement	The system shall inform the student if they are not enrolled in any classes and terminate the process.
Source	Nasir
Rationale	To handle cases where the student has no enrolled classes.
Business Rule	BR-1: Only enrolled classes should be displayed to the student.
Dependencies	FR-97
Priority	Medium

4.16.5 FR-101: ClassAccess.RetrievalFailure

Identifier	FR-101
Title	ClassAccess.RetrievalFailure
Requirement	The system shall display an error message if the retrieval of enrolled classes fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle class retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only enrolled classes should be displayed to the student.
Dependencies	FR-99
Priority	Medium

4.17 UC-17: Class Discussion

4.17.1 FR-102: ClassDiscussion.Initiation

Identifier	FR-102
Title	ClassDiscussion.Initiation
Requirement	The system shall allow a student to access class discussions by selecting the "Discussions" option within a class.
Source	Nasir
Rationale	To provide students with the ability to participate in class discussions.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has accessed a class.
Priority	High

4.17.2 FR-103: ClassDiscussion.Retrieval

Identifier	FR-103
Title	ClassDiscussion.Retrieval

Requirement	The system shall retrieve and display the ongoing discussions for the class.
Source	Nasir
Rationale	To ensure the student can view all active discussions in the class.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	FR-102
Priority	High

4.17.3 FR-104: ClassDiscussion.Read

Identifier	FR-104
Title	ClassDiscussion.Read
Requirement	The system shall allow the student to read existing discussion threads within the class.
Source	Nasir
Rationale	To enable the student to stay informed about ongoing discussions.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	FR-103
Priority	High

4.17.4 FR-105: ClassDiscussion.Reply

Identifier	FR-105
Title	ClassDiscussion.Reply
Requirement	The system shall allow the student to reply to existing discussion threads within the class.
Source	Nasir
Rationale	To enable the student to actively participate in class discussions.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	FR-104
Priority	High

4.17.5 FR-106: ClassDiscussion.Reply

Identifier	FR-106
Title	Discussion.New.Thread
Requirement	The system shall allow the student to start new discussion threads within the class.
Source	Nasir
Rationale	To provide the student with the ability to initiate new topics of discussion.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	FR-99
Priority	High

4.17.6 FR-107: ClassDiscussion.RetrievalFailure

Identifier	FR-107
Title	ClassDiscussion.RetrievalFailure
Requirement	The system shall display an error message if the retrieval of discussions fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle discussion retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only students enrolled in the class can participate in its discussions.
Dependencies	FR-99
Priority	Medium

4.18 UC-18: Download Class Materials

4.18.1 FR-108: MaterialsAccess.Initiation

Identifier	FR-108
Title	ClassMaterials.Access.Initiation
Requirement	The system shall allow a student to access class materials by selecting the "Materials" option within a class.
Source	Nasir
Rationale	To provide students with the ability to download materials provided by the teacher.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has accessed a class.
Priority	High

4.18.2 FR-109: ClassMaterials.List.Retrieval

Identifier	FR-109
Title	ClassMaterials.List.Retrieval
Requirement	The system shall retrieve and display the list of available materials for the class.
Source	Nasir
Rationale	To ensure the student can view all materials provided by the teacher.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-108
Priority	High

4.18.3 FR-110: ClassMaterials.Selection

Identifier	FR-110
Title	ClassMaterials.Selection
Requirement	The system shall allow the student to select a material from the list for download.
Source	Nasir
Rationale	To enable the student to choose specific materials to download.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-109
Priority	High

4.18.4 FR-111: ClassMaterials.Download.Initiation

Identifier	FR-111
Title	ClassMaterials.Download.Initiation
Requirement	The system shall initiate the download process for the selected material.
Source	Nasir
Rationale	To ensure the student can download the selected material.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-110
Priority	High

4.18.5 FR-112: ClassMaterials.Download.Initiation

Identifier	FR-112
Title	ClassMaterials.Download.Notification
Requirement	The system shall notify the student of the successful download of the material.
Source	Nasir
Rationale	To inform the student that the download process has been completed successfully.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-108
Priority	High

4.18.6 FR-113: ClassMaterials.NotAvailable

Identifier	FR-113
Title	ClassMaterials.NotAvailable
Requirement	The system shall inform the student if there are no materials available for download and terminate the process.
Source	Nasir
Rationale	To handle cases where no materials are available for download.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-109
Priority	Medium

4.18.7 FR-114: ClassMaterials.Download.Failure

Identifier	FR-114
Title	ClassMaterials.Download.Failure
Requirement	The system shall display an error message if the download process fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle download errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only materials provided by the teacher should be available for download.
Dependencies	FR-112
Priority	Medium

4.19 UC-19: Participate in Class Quizzes

4.19.1 FR-114: QuizParticipation.Initiation

Identifier	FR-114
Title	QuizParticipation.Initiation
Requirement	The system shall allow a student to participate in quizzes by selecting the "Quizzes" option within a class.
Source	Nasir
Rationale	To provide students with the ability to participate in quizzes created by the teacher.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has accessed a class.
Priority	High

4.19.2 FR-115: QuizParticipation.Retrieval

Identifier	FR-115
Title	QuizParticipation.Retrieval
Requirement	The system shall retrieve and display the list of available quizzes for the class.
Source	Nasir
Rationale	To ensure the student can view all quizzes created by the teacher.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	FR-114
Priority	High

4.19.3 FR-116: QuizParticipation.Questions.Presentation

Identifier	FR-116
Title	QuizParticipation.Questions.Presentation
Requirement	The system shall present the quiz questions to the student in a structured format.
Source	Nasir
Rationale	To ensure the student can view and answer the quiz questions.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	FR-115
Priority	High

4.19.4 FR-117: QuizParticipation.Answer.Submission

Identifier	FR-117
Title	QuizParticipation.Answer.Submission
Requirement	The system shall allow the student to submit their answers to the quiz questions.
Source	Nasir
Rationale	To enable the student to complete the quiz and receive feedback.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	FR-116
Priority	High

4.19.5 FR-118: QuizParticipation.NotAvailable

Identifier	FR-118
Title	QuizParticipation.NotAvailable
Requirement	The system shall inform the student if there are no quizzes available and terminate the process.
Source	Nasir
Rationale	To handle cases where no quizzes are available for participation.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	FR-115
Priority	Medium

4.19.6 FR-119: QuizParticipation.Failure

Identifier	FR-119
Title	QuizParticipation.Failure
Requirement	The system shall display an error message if the quiz participation process fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle quiz participation errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only quizzes created by the teacher should be available for participation.
Dependencies	FR-116
Priority	Medium

4.20 UC-20: Submit Assignments

4.20.1 FR-120: AssignmentSubmission.Initiation

Identifier	FR-120
Title	AssignmentSubmission.Initiation
Requirement	The system shall allow a student to submit an assignment by selecting the "Assignments" option within a class.
Source	Nasir
Rationale	To provide students with the ability to submit assignments provided by the teacher.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has accessed a class.
Priority	High

4.20.2 FR-121: AssignmentSubmission.List.Retrieval

Identifier	FR-121
Title	AssignmentSubmission.List.Retrieval
Requirement	The system shall retrieve and display the list of available assignments for the class.
Source	Nasir
Rationale	To ensure the student can view all assignments provided by the teacher.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-120
Priority	High

4.20.3 FR-122: AssignmentSubmission.Selection

Identifier	FR-122
Title	AssignmentSubmission.Selection
Requirement	The system shall allow the student to select an assignment from the list to submit.
Source	Nasir
Rationale	To enable the student to choose a specific assignment to submit.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-121
Priority	High

4.20.4 FR-123: AssignmentSubmission.Upload

Identifier	FR-123
Title	AssignmentSubmission.Upload
Requirement	The system shall allow the student to upload their completed assignment.
Source	Nasir
Rationale	To enable the student to submit their work for evaluation.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-122
Priority	High

4.20.5 FR-124: AssignmentSubmission.Confirmation

Identifier	FR-124
Title	AssignmentSubmission.Confirmation
Requirement	The system shall confirm the successful submission of the assignment.

Source	Nasir
Rationale	To inform the student that their assignment has been submitted successfully.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-123
Priority	High

4.20.6 FR-125: AssignmentSubmission.NotAvailable

Identifier	FR-125
Title	AssignmentSubmission.NotAvailable
Requirement	The system shall inform the student if there are no assignments available and terminate the process.
Source	Nasir
Rationale	To handle cases where no assignments are available for submission.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-121
Priority	Medium

4.20.7 FR-126: AssignmentSubmission.Confirmation

Identifier	FR-126
Title	AssignmentSubmission.Failure
Requirement	The system shall display an error message if the assignment submission fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle assignment submission errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only assignments provided by the teacher should be available for submission.
Dependencies	FR-123
Priority	Medium

4.21 UC-21: Maintain Streak

4.21.1 FR-127: MaintainStreak.CheckActivity

Identifier	FR-127
Title	MaintainStreak.CheckActivity

Requirement	The system shall check if a completed activity (e.g., quiz, assignment, discussion) contributes to maintaining the student's streak after the student completes the activity.
Source	Nasir
Rationale	To ensure only specific activities count toward maintaining the student's streak, as defined by the system's rules, ensuring the streak system's integrity.
Business Rule	BR-1: Only specific activities contribute to maintaining streaks.
Dependencies	FR-127: Verify Active Streak
Priority	High

4.21.2 FR-128: MaintainStreak.UpdateCount

Identifier	FR-128
Title	MaintainStreak.UpdateCount
Requirement	The system shall update the student's streak count by incrementing it if the completed activity contributes to the streak.
Source	Nasir
Rationale	To accurately reflect the student's streak progress based on their completion of streak-contributing activities, ensuring the streak system is up-to-date.
Business Rule	BR-1: Only specific activities contribute to maintaining streaks.
Dependencies	FR-127
Priority	High

4.21.3 FR-129: MaintainStreak.CheckStreakInactivity

Identifier	FR-129
Title	MaintainStreak.CheckStreakInactivity
Requirement	The system shall detect if the student has not completed a streak-contributing activity within the required time frame to maintain their streak.
Source	Nasir
Rationale	To identify when a student's streak should be broken due to inactivity, ensuring the streak system enforces its time-based rules.
Business Rule	BR-1: Only specific activities contribute to maintaining streaks.
Dependencies	128
Priority	High

4.21.4 FR-130: MaintainStreak.ResetStreakToZero

Identifier	FR-130
Title	MaintainStreak.ResetStreakToZero

Requirement	The system shall reset the student's streak count to zero if the system detects that no streak-contributing activity has been completed within the required time frame.
Source	Nasir
Rationale	To enforce streak rules by resetting the streak when the student fails to maintain it through timely activity completion.
Business Rule	BR-1: Only specific activities contribute to maintaining streaks.
Dependencies	FR-129
Priority	High

4.21.5 FR-131: MaintainStreak.Notify

Identifier	FR-131
Title	MaintainStreak.Notify
Requirement	The system shall notify the student that their streak has been broken and reset to zero after the streak count is reset due to inactivity.
Source	Nasir
Rationale	To inform the student of the streak reset, providing transparency and encouraging them to restart their streak.
Business Rule	None
Dependencies	FR-131
Priority	Medium

4.22 UC-22: View Badge

4.22.1 FR-132: BadgeView.Initiation

Identifier	FR-132
Title	BadgeView.Initiation
Requirement	The system shall allow a student to view their earned badges by selecting the "View Badges" option.
Source	Nasir
Rationale	To provide students with the ability to view their achievements in the form of earned badges.
Business Rule	BR-1: Only earned badges should be displayed to the student.
Dependencies	PRE-1: The student is logged into the application.
Priority	High

4.22.2 FR-133: BadgeView.Retrieval

Identifier	FR-133
Title	BadgeView.Retrieval
Requirement	The system shall retrieve and display the student's earned badges.
Source	Nasir

Rationale	To ensure the student can view all badges they have earned.
Business Rule	BR-1: Only earned badges should be displayed to the student.
Dependencies	FR-132
Priority	High

4.22.3 FR-134: BadgeView.View

Identifier	FR-134
Title	BadgeView.View
Requirement	The system shall allow the student to view details of each earned badge, including the criteria for earning it.
Source	Nasir
Rationale	To provide the student with comprehensive information about their achievements.
Business Rule	BR-1: Only earned badges should be displayed to the student.
Dependencies	FR-123
Priority	High

4.22.4 FR-135: BadgeView.View

Identifier	FR-135
Title	BadgeView.NoEarnedBadges
Requirement	The system shall inform the student if they have not earned any badges and terminate the process.
Source	Nasir
Rationale	To handle cases where the student has no earned badges.
Business Rule	BR-1: Only earned badges should be displayed to the student.
Dependencies	FR-123
Priority	Medium

4.22.5 FR-136: BadgeView.Retrieve.Failure

Identifier	FR-136
Title	BadgeView.Retrieve.Failure
Requirement	The system shall display an error message if the retrieval of badges fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle badge retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only earned badges should be displayed to the student.
Dependencies	FR-123
Priority	Medium

4.23 UC-23: Participate in Coin Quests

4.23.1 FR-137: CoinQuestParticipation.Initiation

Identifier	FR-137
Title	CoinQuestParticipation.Initiation
Requirement	The system shall allow a student to participate in coin quests by selecting the "Coin Quests" option.
Source	Nasir
Rationale	To provide students with the ability to earn coins by completing quests.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	PRE-1: The student is logged into the application.
Priority	High

4.23.2 FR-138: CoinQuestParticipation.List.Retrieval

Identifier	FR-138
Title	CoinQuestParticipation.List.Retrieval
Requirement	The system shall retrieve and display the list of available coin quests.
Source	Nasir
Rationale	To ensure the student can view all available quests to participate in.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-137
Priority	High

4.23.3 FR-139: CoinQuestParticipation.Selection

Identifier	FR-139
Title	CoinQuestParticipation.Selection
Requirement	The system shall allow the student to select a coin quest from the list to participate in.
Source	Nasir
Rationale	To enable the student to choose a specific quest to complete.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-138
Priority	High

4.23.4 FR-140: CoinQuestParticipation.displayQuestions

Identifier	FR-140
Title	CoinQuestParticipation.displayQuestions

Requirement	The system shall present the details and requirements of the selected coin quest to the student.
Source	Nasir
Rationale	To ensure the student understands what is required to complete the quest.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-139
Priority	High

4.23.5 FR-141: CoinQuestParticipation.Completion

Identifier	FR-141
Title	CoinQuestParticipation.Completion
Requirement	The system shall allow the student to complete the quest requirements and mark the quest as completed.
Source	Nasir
Rationale	To enable the student to fulfill the quest requirements and earn coins.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-140
Priority	High

4.23.6 FR-142: CoinQuestParticipation.Reward

Identifier	FR-142
Title	CoinQuestParticipation.Reward
Requirement	The system shall award coins to the student upon successful completion of the quest.
Source	Nasir
Rationale	To reward the student for completing the quest and encourage further participation.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-141
Priority	High

4.23.7 FR-143: CoinQuestParticipation.NotAvailable

Identifier	FR-143
Title	CoinQuestParticipation.NotAvailable
Requirement	The system shall inform the student if there are no available coin quests and terminate the process.
Source	Nasir
Rationale	To handle cases where no quests are available for participation.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-138

Priority	Medium
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4.23.8 FR-144: CoinQuestParticipation.Failure

Identifier	FR-144
Title	CoinQuestParticipation.Failure
Requirement	The system shall display an error message if the quest participation process fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle quest participation errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: Only completed quests should award coins.
Dependencies	FR-139
Priority	Medium

4.24 UC-24: Interact with AI

4.24.1 FR-145: AIInteraction.Initiation

Identifier	FR-145
Title	AIInteraction.Initiation
Requirement	The system shall allow a student to interact with the AI by selecting the "Interact with AI" option.
Source	Nasir
Rationale	To provide students with the ability to seek assistance or information from the AI.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	PRE-1: The student is logged into the application.
Priority	High

4.24.2 FR-146: AIInteraction.Input

Identifier	FR-146
Title	AIInteraction.Input
Requirement	The system shall allow the student to input their query or request for the AI to process.
Source	Nasir
Rationale	To enable the student to communicate their needs to the AI.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	FR-145
Priority	High

4.24.3 FR-147: AIInteraction.Input.Processing

Identifier	FR-147
Title	AIInteraction.Input.Processing
Requirement	The system shall process the student's query or request using the AI and generate a response.
Source	Nasir
Rationale	To ensure the AI provides accurate and relevant information or assistance.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	FR-146
Priority	High

4.24.4 FR-148: AIInteraction.Response.Display

Identifier	FR-148
Title	AIInteraction.Response.Display
Requirement	The system shall display the AI's response to the student's query or request.
Source	Nasir
Rationale	To provide the student with the information or assistance they requested.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	FR-147
Priority	High

4.24.5 FR-149: AIInteraction.UnableToProcessQuery

Identifier	FR-149
Title	AIInteraction.UnableToProcessQuery
Requirement	The system shall inform the student if the AI is unable to process their query and allow them to refine their query or cancel the interaction.
Source	Nasir
Rationale	To handle cases where the AI cannot process the student's query.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	FR-147
Priority	Medium

4.24.6 FR-150: AIInteraction.Failure

Identifier	FR-150
Title	AIInteraction.Failure
Requirement	The system shall display an error message if the AI interaction fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle AI interaction errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The AI must provide accurate and relevant responses to student queries.
Dependencies	FR-146
Priority	Medium

4.25 UC-25: View LeaderBoard

4.25.1 FR-151: LeaderboardView.Initiation

Identifier	FR-151
Title	LeaderboardView.Initiation
Requirement	The system shall allow a student to view their leaderboard position by selecting the "View Leaderboard" option.
Source	Nasir
Rationale	To provide students with the ability to track their performance on the leaderboard.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	PRE-1: The student is logged into the application.
Priority	High

4.25.2 FR-152: LeaderboardView.Filter.Selection

Identifier	FR-152
Title	LeaderboardView.Filter.Selection
Requirement	The system shall allow the student to filter the leaderboard by year, week, or month.
Source	Nasir
Rationale	To enable the student to view their position based on specific time frames.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	FR-151
Priority	High

4.25.3 FR-153: LeaderboardView.FilteredData.Retrieval

Identifier	FR-153
Title	LeaderboardView.FilteredData.Retrieval
Requirement	The system shall retrieve and display the leaderboard data based on the selected filter (year, week, or month).
Source	Nasir
Rationale	To ensure the student can view their position on the leaderboard for the chosen time frame.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	FR-145 (Leaderboard.Filter.Selection)
Priority	High

4.25.4 FR-154: LeaderboardView.Position.Display

Identifier	FR-154
Title	LeaderboardView.Position.Display
Requirement	The system shall display the student's position on the filtered leaderboard.
Source	Nasir
Rationale	To provide the student with a clear view of their ranking for the selected time frame.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	FR-152
Priority	High

4.25.5 FR-155: LeaderboardView.NoDataAvailable

Identifier	FR-155
Title	LeaderboardView.NoDataAvailable
Requirement	The system shall inform the student if no data is available for the selected filter and terminate the process.
Source	Nasir
Rationale	To handle cases where there is no leaderboard data for the chosen time frame.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	FR-152
Priority	Medium

4.25.6 FR-156: LeaderboardView.Retrieval.Failure

Identifier	FR-156
Title	LeaderboardView.Retrieval.Failure

Requirement	The system shall display an error message if the retrieval of the filtered leaderboard fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle leaderboard retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The leaderboard should be filterable by year, week, and month.
Dependencies	FR-153
Priority	Medium

4.26 UC-26: Check Overall Score

4.26.1 FR-157: ScoreCheck.Initiation

Identifier	FR-157
Title	ScoreCheck.Initiation
Requirement	The system shall allow a student to check their overall score by selecting the "Check Overall Score" option.
Source	Nasir
Rationale	To provide students with the ability to view their overall performance across all books.
Business Rule	BR-1: The overall score should be calculated based on all completed quizzes and activities.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has completed quizzes or activities in at least one book.
Priority	High

4.26.2 FR-158: ScoreCheck.Calculation

Identifier	FR-158
Title	ScoreCheck.Calculation
Requirement	The system shall retrieve and calculate the student's overall score across all books based on completed quizzes and activities.
Source	Nasir
Rationale	To ensure the student's overall performance is accurately represented.
Business Rule	BR-1: The overall score should be calculated based on all completed quizzes and activities.
Dependencies	FR-157
Priority	High

4.26.3 FR-159: OverallScore.Display

Identifier	FR-159
Title	OverallScore.Display

Requirement	The system shall display the student's overall score, along with a breakdown by subject or category.
Source	Nasir
Rationale	To provide the student with a detailed view of their performance across different subjects or categories.
Business Rule	BR-1: The overall score should be calculated based on all completed quizzes and activities.
Dependencies	FR-158
Priority	High

4.26.4 FR-160: OverallScore.Display

Identifier	FR-160
Title	OverallScore.WeakPointsHighlight
Requirement	The system shall highlight weak points and areas for improvement based on the student's performance.
Source	Nasir
Rationale	To help the student identify areas where they need to focus for improvement.
Business Rule	BR-2: Weak points and areas for improvement should be highlighted based on performance.
Dependencies	FR-159
Priority	High

4.26.5 FR-161: OverallScore.NoScoresAvailable

Identifier	FR-161
Title	OverallScore.NoScoresAvailable
Requirement	The system shall inform the student if there are no scores available for any books and terminate the process.
Source	Nasir
Rationale	To handle cases where the student has not completed any quizzes or activities.
Business Rule	BR-1: The overall score should be calculated based on all completed quizzes and activities.
Dependencies	FR-158
Priority	Medium

4.26.6 FR-161: OverallScore.NoScoresAvailable

Identifier	FR-161
Title	OverallScore.Retrieval.Failure

Requirement	The system shall display an error message if the retrieval of the overall score fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle overall score retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The overall score should be calculated based on all completed quizzes and activities.
Dependencies	FR-158
Priority	Medium

4.27 UC-27: Check book Score

4.27.1 FR-162: BookScoreCheck.Initiation

Identifier	FR-162
Title	BookScoreCheck.Initiation
Requirement	The system shall allow a student to check their score for quizzes related to a specific book by selecting the "Check Book Score" option.
Source	Nasir
Rationale	To provide students with the ability to view their performance for quizzes in a specific book.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	PRE-1: The student is logged into the application. PRE-2: The student has completed quizzes in the specific book.
Priority	High

4.27.2 FR-163: BookScoreCheck.Book.Selection

Identifier	FR-163
Title	BookScoreCheck.Book.Selection
Requirement	The system shall allow the student to select a specific book from their list of enrolled books.
Source	Nasir
Rationale	To enable the student to choose the book for which they want to view their quiz scores.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	FR-162
Priority	High

4.27.3 FR-164: BookScoreCheck.Score.Calculation

Identifier	FR-164
Title	BookScoreCheck.Score.Calculation
Requirement	The system shall retrieve and calculate the student's score for quizzes related to the selected book.
Source	Nasir
Rationale	To ensure the student's performance for the specific book is accurately represented.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	FR-163
Priority	High

4.27.4 FR-165: BookScoreCheck.Score.Display

Identifier	FR-165
Title	BookScoreCheck.Score.Display
Requirement	The system shall display the student's score for the selected book, along with a breakdown by quiz or topic.
Source	Nasir
Rationale	To provide the student with a detailed view of their performance for the specific book.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	FR-164
Priority	High

4.27.5 FR-166: BookScoreCheck.Book.WeakPoints.Highlight

Identifier	FR-166
Title	BookScoreCheck.Book.WeakPoints.Highlight
Requirement	The system shall highlight weak points and areas for improvement specific to the selected book.
Source	Nasir
Rationale	To help the student identify areas where they need to focus for improvement in the specific book.
Business Rule	BR-2: Weak points and areas for improvement should be highlighted based on performance.
Dependencies	FR-165
Priority	High

4.27.6 FR-167: BookScoreCheck.NoQuizzesCompleted

Identifier	FR-167
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Title	BookScoreCheck.NoQuizzesCompleted
Requirement	The system shall inform the student if they have not completed any quizzes for the selected book and terminate the process.
Source	Nasir
Rationale	To handle cases where the student has not completed any quizzes for the selected book.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	FR-164
Priority	Medium

4.27.7 FR-168: BookScoreCheck.Retrieval.Failure

Identifier	FR-168
Title	BookScoreCheck.Retrieval.Failure
Requirement	The system shall display an error message if the retrieval of the score for the specific book fails and allow the student to retry or cancel the process.
Source	Nasir
Rationale	To handle book score retrieval errors gracefully and provide the student with options to resolve the issue.
Business Rule	BR-1: The score should be calculated based on all completed quizzes for the specific book.
Dependencies	FR-164
Priority	Medium

4.28 UC-28: Check Score for Specific Book

4.29 UC-29: Teacher Registration

4.29.1 FR-169: Account.Register

Identifier	FR-169
Title	Account.Register

Requirement	The teacher shall be able to register an account in the BrainBee app by providing a full name, email address, password (meeting complex requirements), and an optional phone number.
Source	Sohail
Rationale	Teachers need an account to access classroom management tools and analytics, requiring a secure registration process.
Business Rule	BR-1: Email addresses must be unique. BR-2: Password must contain 8+ characters, 1 uppercase letter, and 1 number.
Dependencies	FR-T1-2, FR-T1-3
Priority	High

4.29.2 FR-170: Account.Validate.Email

Identifier	FR-170
Title	Account.Validate.Email
Requirement	Upon entering an email address, the system shall validate that the email is not already registered in the institutional database.
Source	Sohail
Rationale	Ensures uniqueness of teacher accounts to prevent duplication and maintain data integrity.
Business Rule	BR-1: Email addresses must be unique.
Dependencies	FR-T1-4
Priority	High

4.29.3 FR-171: Account.Validate.Password

Identifier	FR-171
Title	Account.Validate.Password
Requirement	Upon entering a password, the system shall validate that it contains at least 8 characters, 1 uppercase letter, and 1 number.
Source	Sohail
Rationale	Enforces password complexity to enhance account security.
Business Rule	BR-2: Password must contain 8+ characters, 1 uppercase letter, and 1 number.
Dependencies	FR-T1-5
Priority	High

4.29.4 FR-172: Account.DuplicateEmail.Error

Identifier	FR-172
Title	Account.DuplicateEmail.Error
Requirement	If the email is already registered, the system shall display an error message: "Email already exists. Log in or use another email."
Source	Sohail
Rationale	Informs the teacher of email duplication and provides clear next steps.
Business Rule	BR-1: Email addresses must be unique.
Dependencies	None
Priority	Medium

4.29.5 FR-173: Account.WeakPassword.Error

Identifier	FR-73
Title	Account.WeakPassword.Error
Requirement	If the password does not meet complexity requirements, the system shall display an error message: "Password must include 8+ characters, uppercase, and a number."
Source	Sohail
Rationale	Guides the teacher to create a secure password meeting system standards.
Business Rule	BR-2: Password must contain 8+ characters, 1 uppercase letter, and 1 number.
Dependencies	none
Priority	Medium

4.29.6 FR-174: Account.Confirmation

Identifier	FR-174
Title	Account.Confirmation
Requirement	Upon successful registration, the system shall store the teacher's account in the database, display a confirmation message, and send a verification email within 2 minutes.
Source	Sohail
Rationale	Verifies successful account creation and ensures the teacher can confirm their email.
Business Rule	BR-3: Confirmation emails must be sent within 2 minutes of registration.
Dependencies	None
Priority	High

4.29.7 FR-75: Account.NoConnection.Error

Identifier	FR-175
Title	Account.NoConnection.Error
Requirement	If internet connectivity is lost during registration, the system shall display an error message: "Connection lost. Please check your internet and try again."
Source	Sohail
Rationale	Notifies the teacher of connectivity issues and prompts corrective action.
Business Rule	None
Dependencies	None
Priority	Medium

4.30 UC-30: Create New Class

4.30.1 FR-176: Class.Create

Identifier	FR-176
Title	Class.Create
Requirement	The teacher shall be able to create a new class by providing a class name, subject, grade level, and an optional class schedule.
Source	Sohail
Rationale	Enables teachers to establish virtual classrooms for instructional purposes.
Business Rule	BR-1: Class names must be unique per teacher.
Dependencies	FR-T2-2
Priority	High

4.30.2 FR-179: Class.Validate.Name

Identifier	FR-179
Title	Class.Validate.Name
Requirement	Upon entering a class name, the system shall validate that the name is unique for the teacher's account.
Source	Sohail
Rationale	Prevents confusion by ensuring no duplicate class names exist for a teacher.
Business Rule	BR-1: Class names must be unique per teacher.
Dependencies	FR-T2-3
Priority	High

4.30.3 FR-180: Class.DuplicateName.Error

Identifier	FR-180
Title	Class.DuplicateName.Error
Requirement	If the class name already exists, the system shall display an error message: "Class name already in use. Please choose another."
Source	Sohail
Rationale	Informing the teacher of name conflicts and prompts a new selection.
Business Rule	BR-1: Class names must be unique per teacher.
Dependencies	None
Priority	Medium

4.30.4 FR-181: Class.DuplicateName.ErrorClass.Generate.Code

Identifier	FR-181
Title	Class.DuplicateName.ErrorClass.Generate.Code
Requirement	Upon successful class creation, the system shall generate a unique 6 character alphanumeric class code for student enrollment.
Source	Sohail
Rationale	Provides a secure method for students to join the class.
Business Rule	BR-2: Class codes must be auto-generated and alphanumeric (6 characters).
Dependencies	FR-T2-5
Priority	High

4.30.5 FR-182: Class.Confirmation

Identifier	FR-182
Title	Class.Confirmation
Requirement	Upon successful class creation, the system shall display a message: "Class created successfully" and add the class to the teacher's dashboard.
Source	Sohail
Rationale	Confirms class creation and ensures visibility on the dashboard.
Business Rule	None
Dependencies	None
Priority	High

4.30.6 FR-183: Class.SaveFailure.Error

Identifier	FR-183
Title	Class.SaveFailure.Error
Requirement	If the system fails to save the class to the database, it shall display an error message: "Error saving class. Try again."
Source	Sohail
Rationale	Alerts the teacher to retry the operation due to a database issue.
Business Rule	None
Dependencies	None
Priority	Medium

4.31 UC-31: Add Students to a Class

4.31.1 FR-184: Students.Add.Manual

Identifier	FR-184
Title	Students.Add.Manual
Requirement	The teacher shall be able to manually enter student email addresses to add them to an existing class.
Source	Sohail
Rationale	Allows teachers to individually enroll students using their emails.
Business Rule	BR-1: Student emails must follow standard email format (e.g., student@domain.com).
Dependencies	FR-T3-3
Priority	High

4.31.2 FR-185: Students.Add.Bulk

Identifier	FR-185
Title	Students.Add.Bulk
Requirement	The teacher shall be able to upload a CSV file containing student data to add multiple students to an existing class.
Source	Sohail
Rationale	Facilitates efficient enrollment of multiple students at once.
Business Rule	BR-1: Student emails must follow standard email format (e.g., student@domain.com).
Dependencies	FR-T3-3
Priority	High

4.31.3 FR-186: Students.Validate.Email

Identifier	FR-186
Title	Students.Validate.Email
Requirement	The system shall validate that each student email follows the standard format (e.g., student@domain.com) before sending invitations.
Source	Sohail
Rationale	Ensures only valid emails receive enrollment invitations.
Business Rule	BR-1: Student emails must follow standard email format.
Dependencies	FR-T3-5
Priority	High

4.31.4 FR-187: Students.BulkUpload.Error

Identifier	FR-187
Title	Students.BulkUpload.Error
Requirement	If the uploaded CSV file contains errors, the system shall highlight invalid rows and allow the teacher to correct and re-upload the file.
Source	Sohail
Rationale	Enables the teacher to fix errors in bulk uploads without restarting the process.
Business Rule	None
Dependencies	None
Priority	Medium

4.31.5 FR-188: Students.InvalidEmail.Error

Identifier	FR-188
Title	Students.InvalidEmail.Error
Requirement	If an email format is invalid, the system shall display an error message: "Invalid email(s). Please correct and retry."
Source	Sohail
Rationale	Notifies the teacher of invalid emails and prompts correction.
Business Rule	BR-1: Student emails must follow standard email format.
Dependencies	None
Priority	Medium

4.31.6 FR-189: Students.SendInvitations

Identifier	FR-189
Title	Students.SendInvitations
Requirement	Upon successful validation, the system shall send enrollment invitations to student emails that expire after 7 days and update the class roster.
Source	Sohail
Rationale	Ensures students receive invitations and are added to the class roster.
Business Rule	BR-2: Invitations expire after 7 days.
Dependencies	None
Priority	High

4.31.7 FR-190: Students.Duplicate.Skip

Identifier	FR-190
Title	Students.Duplicate.Skip
Requirement	If a student is already enrolled, the system shall skip their email and display a message: "X students added successfully. Y duplicates skipped."
Source	Sohail
Rationale	Prevents redundant enrollments and informs the teacher of the outcome.
Business Rule	None
Dependencies	None
Priority	Medium

4.32 UC-32: Monitor Student Performance

4.32.1 FR-191: Performance.View

Identifier	FR-191
Title	Performance.View

Requirement	The teacher shall be able to view a real-time analytics dashboard displaying quiz/assignment scores, progress graphs, and AI-generated insights for a selected student in a class.
Source	Sohail
Rationale	Provides teachers with data to track and adjust student learning paths.
Business Rule	BR-1: Data updates in real-time after quiz submissions. BR-2: AI insights are generated only if ≥ 3 assessments are completed.
Dependencies	None
Priority	High

4.32.2 FR-192: Performance.NoData.Error

Identifier	FR-192
Title	Performance.NoData.Error
Requirement	If no performance data is available, the system shall display a message: "No performance data found. Assign quizzes first."
Source	Sohail
Rationale	Informs the teacher that assessments are required to generate analytics.
Business Rule	None
Dependencies	None
Priority	Medium

4.32.3 FR-193: Performance.DataFailure.Error

Identifier	FR-193
Title	Performance.DataFailure.Error
Requirement	If the system fails to load performance data, it shall display an error message: "Error loading data. Try again later."
Source	Sohail
Rationale	Alerts the teacher to retry due to a data retrieval issue.
Business Rule	None
Dependencies	None
Priority	Medium

4.32.4 FR-194: Performance.LearningPath

Identifier	FR-194
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Title	Performance.LearningPath
Requirement	The teacher shall be able to assign remedial materials by selecting "Create Learning Path" based on performance analytics.
Source	Sohail
Rationale	Enables personalized instruction based on student performance insights.
Business Rule	None
Dependencies	None
Priority	High

4.33 UC-33: Upload Assignment

4.33.1 FR-195: Assignment.Upload

Identifier	FR-195
Title	Assignment.Upload
Requirement	The teacher shall be able to upload an assignment by providing a title, instructions (text or PDF), deadline, and optional attachments.
Source	Sohail
Rationale	Allow teachers to distribute assignments to students efficiently.
Business Rule	BR-1: Assignments must include a title and deadline.
Dependencies	FR-T5-2
Priority	High

4.33.2 FR-200: Assignment.Validate.Deadline

Identifier	FR-200
Title	Assignment.Validate.Deadline
Requirement	The system shall validate that the assignment deadline is a future date before publishing.
Source	Sohail
Rationale	Ensure assignments are relevant and actionable for students.
Business Rule	BR-1: Assignments must include a title and deadline.
Dependencies	FR-T5-4
Priority	High

4.33.3 FR-201: Assignment.Edit

Identifier	FR-201
Title	Assignment.Edit
Requirement	The teacher should be able to edit assignment details before the deadline and republish the updated assignment.
Source	Sohail
Rationale	Allows flexibility to correct or refine assignments prior to the deadline.
Business Rule	None
Dependencies	None
Priority	Medium

4.33.4 FR-202: Assignment.PastDeadline.Error

Identifier	FR-202
Title	Assignment.PastDeadline.Error
Requirement	If the deadline is in the past, the system shall display an error message: "Deadline must be a future date."
Source	Sohail
Rationale	Prevents invalid deadlines from being set.
Business Rule	None
Dependencies	None
Priority	Medium

4.33.5 FR-203: Assignment.Publish

Identifier	FR-203
Title	Assignment.Publish
Requirement	Upon successful validation, the system shall publish the assignment, make it visible to students, and schedule a notification 24 hours before the deadline.
Source	Sohail
Rationale	Ensure students receive assignments and timely reminders.
Business Rule	BR-2: Notifications are sent 24 hours before the deadline.
Dependencies	None
Priority	High

4.33.6 FR-204: Assignment.FileSize.Error

Identifier	FR-204
Title	Assignment.FileSize.Error
Requirement	If an uploaded file exceeds 10MB, the system shall display an error message: "File size exceeds limit. Max 10MB."
Source	Sohail
Rationale	Enforces file size limits to maintain system performance.
Business Rule	None
Dependencies	None
Priority	Medium

4.34 UC-34: Automated Quiz Grading with AI Feedback

4.34.1 FR-205: Quiz.Upload

Identifier	FR-205
Title	Quiz.Upload
Requirement	The teacher shall be able to upload a quiz in PDF, DOCX, or app-generated format, including an answer key or relying on a pre-trained AI model.
Source	Sohail
Rationale	Enables automated grading by providing quiz content to the system.
Business Rule	None
Dependencies	FR-T6-2
Priority	High

4.34.2 FR-206: Quiz.AutoGrade

Identifier	FR-206
Title	Quiz.AutoGrade
Requirement	The system shall process student submissions using NLP for essay/short-answer questions and rule-based scoring for multiple-choice, achieving >95% accuracy for multiple-choice grading.
Source	Sohail
Rationale	Automates grading to save teacher time while maintaining accuracy.
Business Rule	BR-1: AI grading accuracy must exceed 95% for multiple-choice.
Dependencies	FR-T6-3

Priority	High
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4.34.3 FR-207: Quiz.Feedback.Generate

Identifier	FR-207
Title	Quiz.Feedback.Generate
Requirement	The system shall generate AI-based feedback for each student (e.g., "Revise topic: Quadratic Equations") and highlight common errors (e.g., "5 students missed Question 3").
Source	Sohail
Rationale	Provides actionable insights for students and teachers.
Business Rule	BR-2: Feedback must align with curriculum standards.
Dependencies	FR-T6-4
Priority	High

4.34.4 FR-208: Quiz.Publish.Grades

Identifier	FR-208
Title	Quiz.Publish.Grades
Requirement	The system shall publish grades and feedback to student dashboards upon completion of grading.
Source	Sohail
Rationale	Ensure students receive timely results and feedback.
Business Rule	None
Dependencies	None
Priority	High

4.34.5 FR-209: Quiz.ManualOverride

Identifier	FR-209
Title	Quiz.ManualOverride
Requirement	The teacher shall be able to review AI-graded quizzes, edit scores or feedback, and republish the updated results.
Source	Sohail
Rationale	Allows teachers to correct AI errors or adjust grades as needed.
Business Rule	None
Dependencies	None
Priority	Medium

4.34.6 FR-210: Quiz.UnsupportedQuestion.Error

Identifier	FR-210
Title	Quiz.UnsupportedQuestion.Error
Requirement	If the AI cannot grade certain questions (e.g., diagrams), the system shall alert the teacher: "Manually grade 2/10 questions."
Source	Sohail
Rationale	Ensure teachers address ungradable questions manually.
Business Rule	None
Dependencies	None
Priority	Medium

4.35 UC-35: Student Self-Registration

4.35.1 FR-211: Student.Register

Identifier	FR-211
Title	Student.Register
Requirement	The student shall be able to register an account and join a class by entering a class code, email, and password in the BrainBee app.
Source	Sohail
Rationale	Enables students to access classes independently using a teacher-provided code.
Business Rule	BR-2: Students must use institutional email domains.
Dependencies	FR-T7-2
Priority	High

4.35.2 FR-212: Student.Validate.Code

Identifier	FR-212
Title	Student.Validate.Code
Requirement	The system shall validate that the entered class code matches an active class and is not expired (valid for 14 days).
Source	Sohail
Rationale	Ensures only valid, current codes allow enrollment.
Business Rule	BR-1: Class codes expire after 14 days.
Dependencies	FR-T7-4

Priority	High
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4.35.3 FR-213: Student.Validate.Email

Identifier	FR-213
Title	Student.Validate.Email
Requirement	The system shall validate that the student's email is unique and uses an institutional domain.
Source	Sohail
Rationale	Maintains account uniqueness and ensures institutional affiliation.
Business Rule	BR-2: Students must use institutional email domains.
Dependencies	None
Priority	High

4.35.4 FR-214: Student.InvalidCode.Error

Identifier	FR-214
Title	Student.InvalidCode.Error
Requirement	If the class code is invalid or expired, the system shall display an error message: "Invalid code. Try again."
Source	Sohail
Rationale	Notifies the student of an incorrect or expired code and prompts re-entry.
Business Rule	BR-1: Class codes expire after 14 days.
Dependencies	None
Priority	Medium

4.35.5 FR-215: Student.Confirmation

Identifier	FR-215
Title	Student.Confirmation
Requirement	Upon successful registration, the system shall link the student to the class, store the account, and send a confirmation email.
Source	Sohail
Rationale	Confirms enrollment and notifies the student via email.
Business Rule	None
Dependencies	None
Priority	High

4.36 UC-36: Register Account

4.36.1 FR-216: Account.Register

Identifier	FR-216
Title	Account.Register
Requirement	The system allow a parent to register an account in the BrainBee app by providing their full name, email address, password, and an optional phone number.
Source	Sohail
Rationale	Parents need an account to monitor their child's academic performance.
Business Rule	BR-1, BR-2, BR-3
Dependencies	FR-P1-2, FR-P1-3
Priority	High

4.36.2 FR-217: Account.Validate.Email

Identifier	FR-217
Title	Account.Validate.Email
Requirement	The system shall validate that the email entered by the parent is unique before registration.
Source	Sohail
Rationale	Ensures uniqueness of accounts to prevent duplication.
Business Rule	BR-1
Dependencies	FR-P1-4
Priority	High

4.36.3 FR-218: Account.Validate.Password

Identifier	FR-218
Title	Account.Validate.Password
Requirement	The system shall ensure that the password meets complex requirements (at least 8 characters, 1 uppercase letter, and 1 number).
Source	Sohail
Rationale	Enforces secure password practices.
Business Rule	BR-2

Dependencies	None
Priority	High

4.36.4 FR-219: Account.DuplicateEmail.Error

Identifier	FR-219
Title	Account.DuplicateEmail.Error
Requirement	If a parent attempts to register with an already registered email, the system shall display an error message: "Email already exists. Log in or use another email."
Source	Sohail
Rationale	It prevents duplicate accounts.
Business Rule	BR-1
Dependencies	None
Priority	Medium

4.36.5 FR-220: Account.WeakPassword.Error

Identifier	FR-20
Title	Account.WeakPassword.Error
Requirement	If the password does not meet complexity rules, the system shall display: "Password must include 8+ characters, uppercase, and a number."
Source	Sohail
Rationale	Ensures account security.
Business Rule	BR-2
Dependencies	None
Priority	Medium

4.37 UC-37: Monitor Child's Progress

4.37.1 FR-221: Monitor.ChildProgress

Identifier	FR-221
Title	Monitor.ChildProgress
Requirement	The system allow parents to view their child's academic progress, including quiz scores, leaderboard position, and activity history.
Source	Sohail
Rationale	Enables parents to track their child's learning journey.
Business Rule	BR-1: Progress reports must be updated in real-time.
Dependencies	None
Priority	High

4.37.2 FR-222: Child.ViewReportCard

Identifier	FR-222
Title	Child.ViewReportCard
Requirement	The system shall allow parents to view the child's report card for specific subjects.
Source	Sohail
Rationale	Provides parents with detailed academic insights.
Business Rule	None
Dependencies	None
Priority	High

4.37.3 FR-223: Child.ViewLeaderboard

Identifier	FR-223
Title	Child.ViewLeaderboard
Requirement	The system shall allow parents to view their child's leaderboard ranking.
Source	Sohail
Rationale	Helps parents understand their child's competitive standing.
Business Rule	None
Dependencies	None
Priority	Medium

4.37.4 FR-224: Child.WeeklyReport

Identifier	FR-224
Title	Child.WeeklyReport
Requirement	The system shall generate and send weekly and monthly reports to parents.
Source	Sohail
Rationale	Keeps parents informed about long-term progress.
Business Rule	None
Dependencies	None
Priority	Medium

4.38 UC-38: Set Learning Goals for Child

4.38.1 FR-225: Parent.SetGoals

Identifier	FR-225
Title	Parent.SetGoals
Requirement	The system shall allow parents to set academic goals for their children and track completion status.
Source	Sohail
Rationale	Encourages goal-based learning.
Business Rule	BR-1: Goals must have a target completion date.
Dependencies	None
Priority	High

4.38.2 FR-226: Parent.AssignRewards

Identifier	FR-226
Title	Parent.AssignRewards
Requirement	The system shall allow parents to assign rewards (e.g., virtual coins) for goal achievements.
Source	Sohail
Rationale	Motivates children to complete learning objectives.
Business Rule	None
Dependencies	None
Priority	Medium

4.38.3 FR-227: Parent.TrackGoalCompletion

Identifier	FR-227
Title	Parent.TrackGoalCompletion
Requirement	The system shall allow parents to monitor progress towards assigned goals.
Source	Sohail
Rationale	Ensures goal achievement tracking.
Business Rule	None
Dependencies	None
Priority	High

4.39 Apple Authentication

4.39.1 FR-228: InitiateAppleAuthentication.Process

Identifier	FR-228
Title	Initiate Apple Authentication Process
Requirement	When the user selects the option to log in with Apple, the system shall redirect the user to Apple's authentication page.
Source	Nasir
Rationale	To begin the secure authentication process using Apple's Sign In with Apple feature, ensuring a seamless login experience.
Business Rule	BR-237: The redirection must use Apple's official authentication endpoint and comply with its security protocols.
Dependencies	Requires an active internet connection and Apple's Sign In with Apple service availability.
Priority	High

4.39.2 FR-229: Handle Apple Credential Submission

Identifier	FR-229
Title	Handle Apple Credential Submission
Requirement	The system shall allow the user to provide Apple ID credentials on the Apple authentication page or proceed if the user is already logged in via an Apple device.
Source	Nasir
Rationale	To enable users to authenticate using their existing Apple credentials, supporting both manual entry and device-based login continuity.
Business Rule	BR-238: The system must support automatic login if the user is already authenticated on their Apple device.
Dependencies	FR-237: Initiate Apple Authentication Process
Priority	High

4.39.3 FR-230: Process Apple Permission Grant

Identifier	FR-230
Title	Process Apple Permission Grant
Requirement	When the user grants permission to the application on the Apple authentication page (for first-time login), the system shall proceed with the login process.

Source	Nasir
Rationale	To ensure the application can access necessary user data (e.g., Apple ID) for authentication, adhering to Apple's privacy standards.
Business Rule	BR-239: Permission must be requested only for first-time logins; subsequent logins should bypass this step if previously granted (per BR-2).
Dependencies	FR-238: Handle Apple Credential Submission
Priority	High

4.39.4 FR-231: Complete Apple Authentication

Identifier	FR-231
Title	Complete Apple Authentication
Requirement	After successful permission grant or existing authorization, the system shall log the user in using their Apple credentials and link the Apple account with the application.
Source	Nasir
Rationale	To authenticate the user and establish a persistent link for future logins, ensuring a secure and efficient process.
Business Rule	BR-240: The system must store the Apple account link securely and comply with Apple's privacy and security standards.
Dependencies	FR-239: Process Apple Permission Grant
Priority	High

4.39.5 FR-232: Handle Apple Authentication Failure

Identifier	FR-232
Title	Handle Apple Authentication Failure
Requirement	If Apple authentication fails or is denied, the system shall inform the user of the failure and provide options to retry or cancel.
Source	Nasir
Rationale	To provide clear feedback to the user in case of authentication issues, allowing them to resolve the problem or exit gracefully.
Business Rule	BR-241: The system must display a user-friendly error message and offer retry or cancel options.
Dependencies	FR-240: Complete Apple Authentication
Priority	Medium

4.39.6 FR-233 Terminate Authentication on Cancel

Identifier	FR-243
Title	Terminate Authentication on Cancel
Requirement	If the user chooses to cancel after an authentication failure, the system shall terminate the authentication process and return to the login page.
Source	Nasir
Rationale	To respect the user's decision to abort the process, ensuring the system does not persist with an unsuccessful attempt.
Business Rule	BR-243: Cancellation must reset the authentication state and return the user to the initial login screen.
Dependencies	FR-241: Handle Apple Authentication Failure
Priority	Medium

4.40 FR's for Events

4.40.1 FR-234: ParentNotification onQuizCompletion

Identifier	FR-234
Title	Parent Notification on Quiz Completion
Requirement	When a child completes a quiz, the system shall send a real-time notification to the parent, provided internet is active; otherwise, queue the notification for later delivery.
Source	Nasir
Rationale	To keep parents informed about their child's academic progress in real-time, enhancing engagement and oversight.
Business Rule	BR-228: Notifications must be delivered immediately if online; otherwise, queued for delivery when connectivity is restored.
Dependencies	Requires internet connectivity monitoring and notification system integration.
Priority	High

4.40.2 FR-235: TeacherNotificationonAssignmentSubmission

Identifier	FR-235
Title	Teacher Notification on Assignment Submission
Requirement	When a student submits an assignment, the system shall send a notification to the teacher, provided internet is active; otherwise, queue the notification for later delivery.
Source	Nasir
Rationale	To ensure teachers are promptly informed of student submissions for timely grading and feedback.
Business Rule	BR-229: Notifications must be sent in real-time if online; otherwise, queued until connectivity is restored.
Dependencies	Requires internet connectivity monitoring and notification system integration.
Priority	High

4.40.3 FR-236: HandleInternetConnectionLoss

Identifier	FR-236
Title	Handle Internet Connection Loss
Requirement	When the system detects a loss of internet connection, it shall display an offline mode and pause syncing until connectivity is restored.
Source	Nasir
Rationale	To ensure users are aware of connectivity issues and prevent data loss by pausing syncing operations.
Business Rule	BR-230: Offline mode must clearly indicate the app's status and prevent data loss during connectivity issues.
Dependencies	Requires network status monitoring functionality.
Priority	Medium

4.40.4 FR-237: HandleInternetConnectionRestoration

Identifier	FR-237
Title	Handle Internet Connection Restoration
Requirement	When the system detects internet connection restoration, it shall resume syncing and update data; otherwise, remain in offline mode.
Source	Nasir
Rationale	To ensure seamless data synchronization once connectivity is restored, maintaining data consistency.
Business Rule	BR-231: Syncing must resume automatically upon detecting internet restoration.
Dependencies	Requires network status monitoring and data syncing functionality.

Priority	Medium
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4.40.5 FR-238: GenerateWeeklyReportforParents

Identifier	FR-238
Title	Generate Weekly Report for Parents
Requirement	At the scheduled time, the system shall generate and send a weekly report to parents using available child performance data; if no data is available, log an error and notify the admin.
Source	Nasir
Rationale	To provide parents with regular updates on their child's progress, ensuring consistent monitoring.
Business Rule	BR-232: Reports must be generated and sent weekly; errors must be logged for admin review.
Dependencies	Requires performance data collection and scheduling system.
Priority	High

4.40.6 FR-239: UpdateLeaderboardDaily

Identifier	FR-239
Title	Update Leaderboard Daily
Requirement	At the scheduled daily update time, the system shall recalculate student rankings and update the leaderboard display; if no scores are available, skip the update and log the event.
Source	Nasir
Rationale	To maintain an up-to-date leaderboard, motivating students through competition.
Business Rule	BR-233: Leaderboard updates must occur daily; skipped updates must be logged for review.
Dependencies	Requires student score data and scheduling system.
Priority	Medium

4.40.7 FR-240: HandleGoalDeadline

Identifier	FR-240
Title	Handle Goal Deadline
Requirement	When a goal deadline is reached, the system shall mark the goal as complete or incomplete based on progress and notify the parent accordingly.
Source	Nasir

Rationale	To ensure parents are informed of goal completion status, supporting goal-oriented learning.
Business Rule	BR-234: Goal status must be updated automatically, and parents must be notified upon deadline.
Dependencies	Requires goal tracking and notification system.
Priority	Medium

4.40.8 FR-241: HandleQuizTimeLimitExpiration

Identifier	FR-241
Title	Handle Quiz Time Limit Expiration
Requirement	When a quiz time limit expires, the system shall automatically submit the quiz, calculate the score, and display results; otherwise, allow the quiz to continue.
Source	Nasir
Rationale	To enforce time limits on quizzes, ensuring fairness and timely completion.
Business Rule	BR-235: Quiz submission must be automatic upon time limit expiration, with results displayed immediately.
Dependencies	Requires quiz timer and scoring system.
Priority	High

4.40.9 FR-242: HandleAssignmentDeadline

Identifier	FR-242
Title	Handle Assignment Deadline
Requirement	When an assignment deadline passes, the system shall mark unsubmitted assignments as late and notify the teacher; otherwise, keep the assignment open for submissions.
Source	Nasir
Rationale	To ensure teachers are informed of late submissions, facilitating timely grading and feedback.
Business Rule	BR-236: Late assignments must be marked, and teachers must be notified upon deadline expiration.
Dependencies	Requires assignment tracking and notification system.
Priority	High

5. Non-Functional Requirements

5.1 Usability

USE-1: 95% of users shall be able to navigate and understand BrainBee within 5 minutes of first use.

USE-2: The UI shall be intuitive, allowing users to easily access learning modules, quizzes, and challenges.

USE-3: The AI-based quiz system shall correctly interpret at least 90% of user queries.

USE-4: Navigation within the app shall be smooth, with minimal learning curve for students and parents.

5.2 Performance

PER-1: Quiz generation shall be completed within 5 seconds of a user request.

PER-2: Flashcards, videos, and learning resources shall load within 3 seconds.

PER-3: User progress tracking and updates shall be reflected in real time.

5.3 Interoperability

IOP-1: The system shall support image uploads in JPG and PNG formats for profile pictures or learning materials.

IOP-2: All API communication shall be conducted over HTTP/HTTPS protocols.

5.4 Security

SEC-1: User passwords shall be encrypted before storage.

SEC-2: Only authenticated users shall have access to learning modules, quizzes, and challenges.

SEC-3: Student progress data shall be stored securely to prevent unauthorized access.

5.5 Integrity

INT-1: Learning materials, once uploaded, shall remain unchanged unless modified by authorized users.

INT-2: The system shall prevent unauthorized modification or deletion of quiz results and student progress data.

5.6 Scalability

SCA-1: The system shall be capable of handling an increasing number of users, quizzes, and learning resources without performance degradation.

SCA-2: The database shall be designed to accommodate growing storage needs for student progress, quizzes, and study materials.

5.7 Reliability

REL-1: The system shall be available 99.9% of the time except during scheduled maintenance.

REL-2: In case of system failure, user progress shall not be lost and will be restored upon reconnection.

6. External Interface Requirements

6.1 User Interface Requirements

UI-1: The color scheme shall use soft and student-friendly colors to reduce eye strain and enhance focus.

UI-2: A bottom navigation bar shall be displayed on every screen, providing quick access to key modules such as Learning, Quiz, and Challenges.

UI-3: A back button shall be visible on all screens for easy navigation within the app.

UI-4: A search bar shall be prominently placed on the main screen to help students and parents quickly find books, topics, and quizzes.

UI-5: All error messages shall be clear, concise, and user-friendly, providing guidance on resolving issues.

6.2 Software Interfaces

SI-1: BrainBee shall integrate with Google Drive API to allow students to upload and save learning materials.

SI-2: The system shall be compatible with major mobile browsers, including Chrome and Edge, ensuring seamless access for web users.

SI-3: BrainBee shall interact with AI-based APIs to generate quizzes dynamically for students based on their learning progress.

6.3 Hardware Interfaces

HI-1: The application shall access the mobile device's camera for features such as scanning handwritten notes or detecting objects for educational purposes.

HI-2: The system shall be compatible with cloud-based storage solutions to store student progress, video lectures, and learning resources.

6.4 Communication Interfaces

CI-1: The mobile app shall communicate with backend services securely using HTTPS to protect user data.

CI-2: The app shall support secure real-time chat for student collaboration and peer discussions with minimal delay.

7. References

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