

San Francisco State University
Computer Science Department
Database Systems
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Conceptual Model: iLearn Database System

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Project Description

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Project Description

Every student and teacher should be equipped with online learning sites that should allow students to efficiently log in to their own portals, access all the classes they are and have taken, be able to manipulate and change the data within each class, among all, homework and projects. Each student should also be able to upload files to turn in homework, keep organized of each semester, each class, and each project, or even, lesson, notes, announcements. In essence, the site should become a powerhouse for students and teachers to have their full and utmost capabilities by being a tool that enhances productivity.

In order to have a successful learning site, there needs to be a proficient database system where all necessary information can be stored, accessed, modified, and more. The iLearn Database System's goal is to efficiently and effectively store data regarding a student's online experience with handling each and every class within a semester, or even within their entire college years.

Use Cases

USE CASE TITLE:	ACCESS CLASSES
ACTORS:	STUDENTS, TEACHERS
DESCRIPTION:	THIS USE CASE BEGINS WHEN A STUDENT OR TEACHER NEEDS TO ACCESS A SPECIFIC CLASS SUCH AS CSC 415. THE STUDENT LOGS IN TO THE WEBSITE, WHERE A LIST OF CLASSES WITHIN THE CURRENT SEMESTER WILL BE LISTED. THIS USE CASE ENDS AFTER THE USER ENTERS THE SPECIFIC PAGE FOR THE CLASS.

USE CASE TITLE:	UPLOAD HOMEWORK
ACTORS:	STUDENTS
DESCRIPTION:	THIS USE CASE BEGINS WHEN A STUDENT ENTERS A SPECIFIC PAGE FOR A CLASS ON THE SITE AND PULLS UP A PAGE WHERE HE/SHE IS ABLE TO UPLOAD A SPECIFIC FILE. THE STUDENT MAY ALSO LEAVE A DESCRIPTION OF THE FILE BEING UPLOADED. AFTER THE FILE HAS BEEN UPLOADED, A TIME AND DATE STAMP WILL BE AVAILABLE FOR REFERENCE AS WELL AS A HYPERLINK TO THE FILE THAT WAS UPLOADED AND A NOTIFICATION IS GIVEN TO THE STUDENT. THE USE CASE ENDS AFTER A FILE HAS BEEN UPLOADED AND NO LONGER ABLE TO CHANGE THE SUBMISSION.

USE CASE TITLE:	POST HOMEWORK
ACTORS:	TEACHERS
DESCRIPTION:	THIS USE CASE BEGINS WHEN A TEACHER ASSIGNS A HOMEWORK THROUGH THE SPECIFIC CLASS PAGE. THE TEACHER NEEDS TO OPEN A LIST OF ACTIONS SPECIFICALLY FOR TEACHERS AND CLICK SUBMISSION PAGE THAT ENABLES THEM TO LABEL THE HW ASSIGNED, PROVIDE A DUE DATE AND DETAILS ON THE ASSIGNMENT. THIS TEST CASE ENDS WHEN

USE CASE TITLE:	ACCESS PREVIOUS CLASSES FROM PREVIOUS SEMESTERS
ACTORS:	STUDENTS, TEACHERS
DESCRIPTION:	THIS USE CASE BEGINS WHEN A STUDENT/TEACHER NEEDS TO ACCESS A CLASS PREVIOUSLY TAKEN/ TAUGHT. THE ACTOR WILL BE ABLE TO SEE A LIST OF PREVIOUS SEMESTERS FROM THE BEGINNING OF THEIR TIME WITHIN THE UNIVERSITY. EACH SEMESTER WILL HAVE A LIST OF CLASSES THAT WAS TAKEN WITHIN THE SEMESTER, WHERE THE ACTOR WILL BE ABLE TO CLICK ON IF ENABLED. IF NOT THE ACTOR MAY JUST VIEW THE CLASSES TAKEN PREVIOUSLY AS A REFERENCE. THE USE CASE ENDS WHEN THE ACTOR IS ABLE TO PULL UP THE SPECIFIC CLASS FROM A PREVIOUS SEMESTER OR PLAINLY SEE A SPECIFIC CLASS FROM THE PREVIOUS SEMESTER.

USE CASE TITLE:	CREATE DISCUSSION FORUMS
ACTORS:	STUDENTS,TEACHERS
DESCRIPTION:	THIS USE CASE BEGINS WHEN STUDENTS AND TEACHERS, UNDER A SPECIFIC CLASS PAGE, IS ABLE TO GO TO THE NEWS AND FORUMS LINK, WHERE A STUDENT OR TEACHER OR BOTH, ARE ABLE TO CREATE A NEW FORUM, LABEL IT AND UPDATE IT. EACH FORUM CAN BE UPDATED AND CREATED BY ANY STUDENT OR TEACHER WITHIN THE CLASS. THIS USE CASE ENDS WHEN A TEXT BOX IS POSTED WITH A DATE AND A LABEL OF THE SPECIFIC FORUM CREATED.

Database Requirements (Business Rules)

User

1. A user shall be assigned and access only one account
2. A user shall be able to have multiple resources to navigate the website
3. A user shall be able to access the Library from the website
4. A user shall be able to access books through a link within the website
5. A user should be able to view announcements
6. A user shall be able to access electronics through a link within the website
7. A user shall be part of a university
8. A user shall be able to submit forms through the website
9. A user shall be able to access the archive of classes through the website
10. A user shall be able to access the archive of events through the website
11. A user shall be able to edit his/her own forum post one at a time

Educator

12. An educator shall be able to post multiple announcements
13. An educator shall be able to access previous classes
14. An educator shall be able to create multiple forums
15. An educator shall be able to create multiple discussion posts
16. An educator can only access one class at a time
17. An educator shall have at least one class
18. An educator shall provide at least one homework assignment
19. An educator shall provide at least one test
20. An educator shall provide at least one quiz
21. An educator shall assign one grade per student
22. An educator shall assign many grades
23. An educator shall have many schedules
24. An educator shall teach many classes

Student

25. A student shall be able to re-upload drafts multiple times while the assignment is not submitted
26. A student shall be able to upload one submission per homework assignment
27. A student shall be able to access previous semesters from when they began going to the university
28. A student shall be able to access previous classes
29. A student shall be able to create multiple forums
30. A student shall be able to create multiple discussion posts
31. A student can only access one class at a time

- 32. A student should be able to take a timed exam at one time
- 33. A student should be able to take a timed quiz at one time
- 34. A student shall take an exam within the time frame provided
- 35. A student is only allowed to open a quiz within a specified date
- 36. A student is only allowed to open an exam within a specific date
- 37. A student shall have a grade per class
- 38. A student shall be able to have one professor per class

University

- 39. A university shall have many semesters
- 40. A university shall be part of at least one region
- 41. A university shall have many employees
- 42. A university shall have 0 to many websites
- 43. A university shall have 0 to many libraries

Class

- 44. A class shall have at least one educator
- 45. A class shall have at least one subject
- 46. A class shall have many students

Website

- 47. A website shall have an archive
- 48. A website shall be managed by at least one developer
- 49. A website shall have many resources

Library

- 50. A library shall have many forms of multimedia
- 51. A library shall have at least one computer
- 52. A library shall have at least one tablet
- 53. A library shall have many books

Archive

- 54. An archive shall have records of previous semesters
- 55. An archive shall have records of many classes

Department

- 56. A department shall create at least one class
- 57. A department shall be part of only one college

Book

- 58. A book shall be written by at least one author
- 59. A book shall have one and only one ISBN

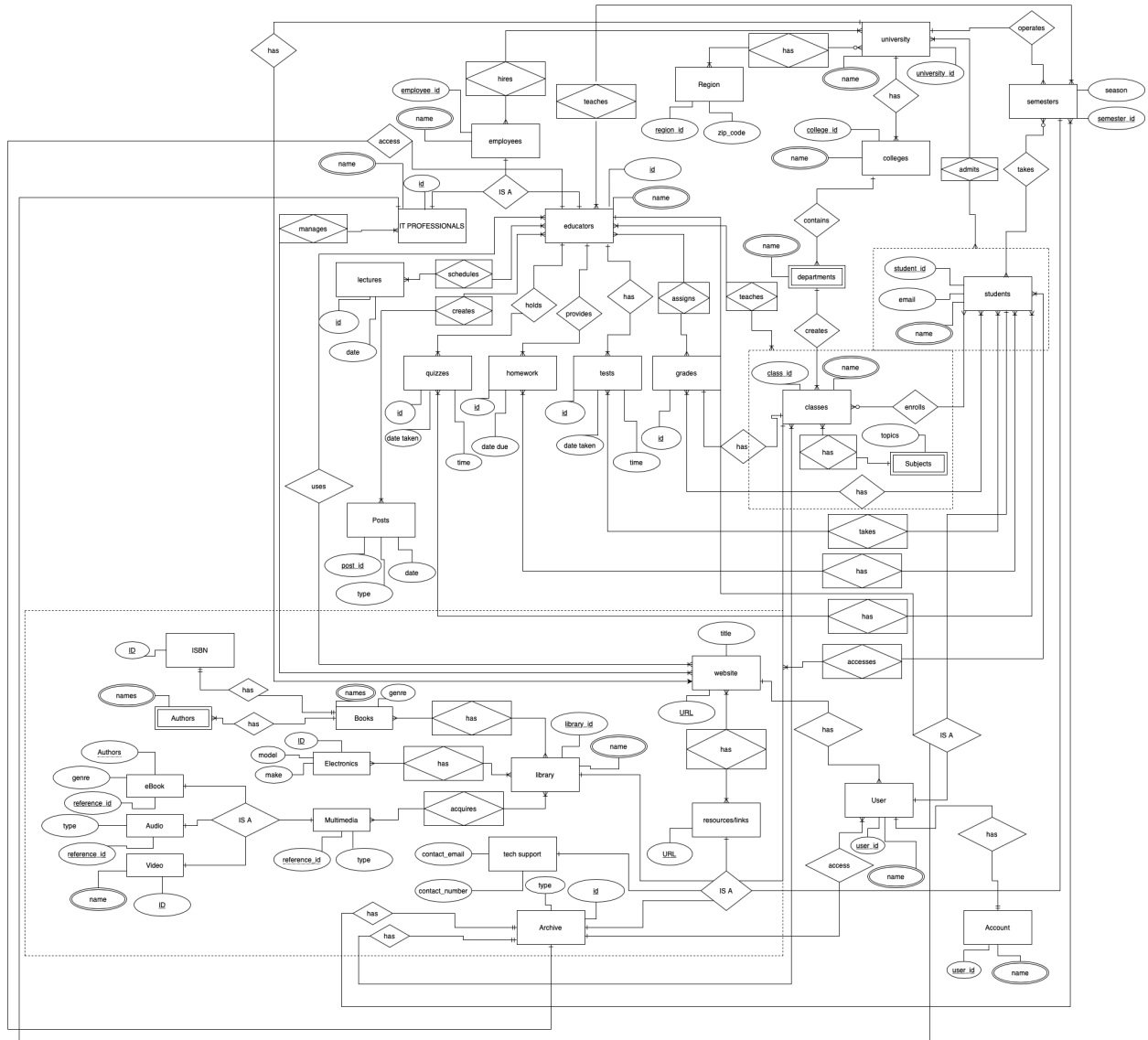
Detailed List of Main Entities, Attributes and Keys

1. User: Strong
 1. Student number: key, numeric
 2. name: composite, alphanumeric
 3. Email address: key, alphanumeric
2. Courses: Strong
 1. name: composite, alphanumeric
 2. id: key, numeric
3. Class: Strong
 1. Subject: composite, alphanumeric
 2. Class number: key, numeric
4. Semesters: Strong
 1. Courses: key, alphanumeric
 2. Name: composite, alphanumeric
 3. Date: multi-value
5. Person: Strong
 1. user_id: key, numeric
 2. name: composite, alphanumeric
 3. email_address: multi-value
6. Grades: Strong
 1. Student_id: key, numeric
 2. Letter assignment: composite, alphanumeric
7. University: Strong
 1. Colleges: composite, alphanumeric
 2. Name: composite, alphanumeric
 3. Address: multi-value
8. Professors: Strong
 1. Id: key, numeric
 2. Name: composite, alphanumeric
 3. department: composite, alphanumeric
9. Homework: Strong
 1. Name: composite, alphanumeric
 2. Date assigned: multi-value
 3. Due date: multi-value
10. Exam: Strong
 1. Topic: composite, alphanumeric
 2. Date assigned: multi-value
 3. Due date: multi-value
 4. Time limit: multi-value, timestamp

11. Quiz: Strong
 1. Topic: composite, alphanumeric
 2. Date assigned: multi-value
 3. Due date: multi-value
 4. Time limit: timestamp, multi-value
12. Subject: Strong
 1. Name: composite, alphanumeric
 2. Participants: composite, alphanumeric
 3. department/faculty: composite, alphanumeric
13. Discussion Post: Strong
 1. Time created: multi value
 2. Content: alphanumeric, composite
 3. Date created: multi-value timestamp
14. Library: Strong
 1. Time created: multi-value, timestamp
 2. Contact: composite, numeric
 3. Address: multi-value
 4. Hours: numeric, composite
15. Discussion Forum: Strong
 1. Posts created: composite, alphanumeric
 2. Time Created: multi-value
 3. Content: composite, alphanumeric
16. Admin: Strong
 1. Name: composite, alphanumeric
 2. Login name: composite, alphanumeric
 3. Password: multi-value, composite
17. Calendar: Strong
 1. Dates: multi-value
 2. Events: composite, alphanumeric
 3. Student_id: key, numeric
18. Archive: Strong
 1. Name: composite, alphanumeric
 2. Courses taken: composite, alphanumeric
 3. Upcoming semesters: composite, alphanumeric
19. Forms: Strong
 1. Name: alphanumeric
 2. Topic: alphanumeric
 3. Email: alphanumeric
 4. Phone number: numeric
 5. Date: alphanumeric
20. Electronics: Strong
 1. brand: alphanumeric
 2. id: numeric

- 3. Model: alphanumeric
- 4. type: alphanumeric
- 21. Books: Strong
 - 1. Title: alphanumeric
 - 2. Isbn: numeric
 - 3. Section: alphanumeric
 - 4. Author: alphanumeric
- 22. Schedules
 - 1. Date: composite, numerical
 - 2. Owner: composite, alphanumeric
 - 3. id: numeric
- 23. Authors
 - 1. name: composite, alphanumeric
 - 2. role: alphanumeric
 - 3. Genre: alphanumeric
 - 4. id: numeric
- 24. Multimedia
 - 1. type: alphanumeric
 - 2. id: numeric

Entity Relationship Diagram



Testing Table

Rule	Entity A	Relation	Entity B	Cardinality	Pass/ Fail	Error Description
1	User	has	Account	0-1	Fail	No user entity
2	User	Access	Resources	1-M	Fail	No user entity
3	User	Access	Library	1-M	Fail	No user entity
3	User	has	Books	0-M	Fail	No user entity
4	User	has	Announcements	0-M	Fail	No user entity
5	User	Part of	University	1-1	Fail	No user entity
6	User	has	Electronics	0-M	Fail	No user entity
7	User	Submit	Forms	0-M	Fail	No user entity
8	User	has	Class Archive	0-M	Fail	No user entity
9	User	has	Semester Archive	0-M	Fail	No user entity
10	User	edit	Post	0-M	Fail	No user entity
11	Educator	post	Announcements	0-M	Fail	No user entity
12	Educator	access	Class Archive	0-M	Fail	Educator doesn't connect to archives
13	Educator	access	Semester Archive	0-M	Fail	Educator doesn't connect to archives
14	Educator	create	Forum	0-M	Fail	No forum entity
15	Educator	create	discussions	0-M	Fail	No discussion entity
16	Educator	access	Class	1-1	Pass	
17	Educator	has	Class	1-M	Pass	
18	Educator	provide	homework	1-M	Pass	
19	Educator	provide	exam	1-M	Pass	
20	Educator	provide	quiz	1-M	Pass	
21	Educator	assign	Grades	1-M	Pass	
22	Educator	have	schedules	1-M	Pass	
23	Student	upload	Draft	0-M	Fail	No draft entity
24	Student	Takes	Exam	1-M	Pass	

25	Student	takes	quiz	1-m	Pass	
26	Student	takes	homework	1-M	pass	
27	Student	takes	Class	1-M	Pass	
28	University	have	semesters	M-M	Pass	
29	University	Hires	Employees	M-M	Pass	
30	Class	Have	Educator	1-M	Pass	
31	Class	Enrolls	Students	M-M	Pass	
32	resources	Is a	Archive	1-1	Pass	
33	website	Have	Resources	1-M	Pass	
34	Library	Have	Books	M-M	Pass	
35	Library	Have	Electronics	M-M	Pass	
36	Library	Have	Multimedia	M-M	Pass	
37	Archive	Have	Semesters	1-M	Fail	Semesters was an attribute
38	Archive	Have	Classes	1-M	Fail	Classes was an attribute
39	Department	Creates	classes	M-M	Pass	
40	Book	Has	Author	1-M	Pass	
41	Book	has	ISBN	1-1	Fail	ISBN was an attribute