BUE E-learning Database System

Relational Database system of the E-learning of The British university in Egypt.

It is used to create, hold, manage and manipulate several kinds of data such as files, records and different information. Also, it aims to manage the relationships between the whole Entities from different areas not only to reduce the redundancy and inconsistency but also to assist professors and decision makers to take the correct action. That can be made by providing a number of reports and statistics according the entered data and some processing.

BUE
Database System

Database System Project

Database description:

The database system will mainly focus on the e-learning system data which includes modules, students, professors, TAs, grades and other information. It is built essentially in order to assist and connect Between Students, Teachers, modules and additional programs.

• Students

The database holds the required data of the students as it is shown in the following table. These data will be used in different processes such as login and several enrollments (Authentication and Authorization). Also, it connects between each student and his academic online actions like Claims, module evaluation, Announcements and online payment records in “one-to-Many” relationship. In addition, it connects between students and modules in a “Many-to-Many” relationship through the Stud_Mod entity (junction table) which includes the common data between each student and his modules. Similarly, there is another two “Many-to-Many” relationships that connect between the students and summer programs and student hub activities.

• Stuff

The database stores the required data of professors and TAs as it is shown in the following table as well. Similarly, these data allow the teachers to access the e-learning system. However, since the stuff profession is not similar, their access limitation (role) is not similar as well. For this reason, the database connects between individuals and their accessible areas (One-to-One) such as adding, deleting, and updating modules or even editing other users’ data (admin). Moreover, it connects between teachers and the announcement that they send to the students who enrolled in a specific module in an ”One-to-Many” relationship. Also, there is a “Many-to-Many” relationship that connects between stuff and the modules that they teach through the “Stuff_Mod” entity (junction table) which also records their last update.

- **Module**

Similarly, the Module entity stores each module's attributes. It connects between each module and its own overview in a "One-to-One" relationship. In addition, it connects between each module and its past exams, projects, reports and weeks (units) in an "One-to-many" relationship.

Notes:

1. The RDBMS is created to be a single system for both students and stuff. That system should contain all the required functions and information, so it is considered as a result of merging the current BUE e-learning system and SRS to become one system.

2. Staff can be either professors or TAs. Also, TAs might be student, so the Constraint type between the superclass (User) and its subclasses (Staff and Students) is overlapping. As a result, the table "User" is created to hold the common data between Stuff and student user (Super class) which allows a single user to be both Student and stuff by inserting the same id in the other two Table (Student and Stuff).

3. The reason why the Study entity (junction table) has the multi-valued attribute (Hr_Week_No) is to store the number of hours per day that the student uses the e-learning every week. Also, it stores the last time (Last_view) he opened it. As a result, the instructor will be able to know this information.

4. Each Stuff user has a role_Id that points to his accessibility in Role table

5. The role table has a unique name for each row (student, Professor, TA, Admin, ..), this table will be used to differ between the different kinds of user's accessibility.

6. Since the address is a composite attribute, it is separated to another table

7. Since there are a number of stuff can teach the same modules (TAs) and one of the stuff can teach different module, there is a junction table to connect between this many to many relationship (Teach)

8. Similar to the previous point (6), there is another junction table to connect between the student and modules (Study)

9. Each module may have one task or more and each task can be a report, homework or project. Each task is related to one module and can be submitted by a single student in a specific date. As a result, there is a standalone table that contains each task information and each task knows only about its module. Plus, there, is a submission table (junction table) that connect between each task and the student who submitted in addition to the submitted file id that points to the file information including the submission date and time in Files table. Therefore, all information is stored successfully and can be retrieved for different uses.

10. The course overview is presented in the home page of the e-learning and each overview has different information and knows about its module.

11. Module evaluation allows student to rate the professor, TA, and module, so it contains a number of foreign keys that point to a single student, two stuff and one module.

12. Each student has a number of exam time tables but each exam time table is made only for one student, so each row in the (Exam_TT) entity knows about its student by (Stud_id) attribute.

13. Student Hub in BUE is department that contains different non-academic programs for students such as (Healthy routine) program. Each program has different teacher from (Stuff)

14. Stuff user can send an announcement by the e-learning for a specific module and specific department. Then, students can receive it as notification on the their elearning account as well.

15. There are three file tables were created. (Mod_file, Sub_file, Announc_File) so that each file table will contain the id of his parent (Module, Submission, Announcement) and not vice versa. As a result, each parent table has its own file table. Plus, the possibility of multi-valued attributes of files is available.

16. Since the submission (Junction table between student and Task tables) may have more than one file, another table is created (sub_file) as child table to store the files information for each submission

17. Similar to (16), the Study table (Junction table between student and Module tables) has a unique attribute to work as a foreign key in Week_Hr table to store the number of hours that the student spend daily on the E-learning.

No	Entity	Attributes
1.	User	• ID • Fname • Lname • Password. • Img_src • Department. • Mail.
2.	Address	• User_ID • City • Zip • Str_name • Str_NO • Region
3.	Phone_No	• Phone_ID • Phone_No • Is_confirmed • User_ID
4.	Student	• ID • Semester. • Status. • Year.
5.	Staff	• ID. • Profession. • Role_ID
6.	Study	• Mod_ID • Stud_ID • Enroll_date • Last_view. • Grade. • Progress. • Semester_NO • Ac_year

7.	Week_Hr	• ID • Week_No • Day_No • Hr_No • Study_ID
8.	Teach	• Mod_ID • Staff_ID • Last_Update. • Is_creator
9.	Role	• Role_ID • Role_Name • Insert_crs • Delete_crs • Update_crs • Add_user • Edit_User
10.	Module	• ID. • Name. • Specific • Weeks_No
11.	Mod_File	• ID • File_name • Size • Upload_date • Type • Week_No • Mod_ID
12.	Task	• ID. • Open_date. • Deadline. • Attemps_No • type • Weight

		• Group_No • Mod_ID •
13.	Submission	• Stud_ID. • Task_ID • File_ID • Sub_Date • Grade • Comment
14.	Sub_File	• ID • Title. • Upload_Date • Size • type • Sub_ID
15.	Past_Exams	• ID. • Title. • Date. • Creator • Mod_ID
16.	Week	• ID. • Number. • Media_src • Comment
17.	Course_Overview	• ID. • Title. • IMG. • Mod_link
18.	Mod_Evaluation	• ID. • Mod_Rate. • Prof_Rate. • TA_Rate. • Date. • Comment. • Stud_ID • Mod_ID • prof_ID

		• TA_ID
19.	Exam_TT	• ID. • Year. • Semester • Img_src • Pub_date. • Stud_ID
20.	Online_pay	• ID. • Amount. • Date. • Academic_Year • Trans-type. • Stud_ID
21.	Summer_Prog	• ID. • Title. • Duration. • Description. • Available_Num • Form_link • Teacher.
22.	Student_Hub	• ID. • Prog_Link. • IMG. • Name. • Teacher
23.	Sum_Enroll	• Sum_Prog_ID • Stud_ID • Progress • Certificate • Enroll
24.	StudHub_Enroll	• Stud_ID • StudHub_ID • Enroll_date

		• Is_online
25.	Announcements	• ID • Subject • Content • Department • Mod_ID • Staff_ID
26.	Announce_File	• File_ID • Title. • Upload_Date • Size • Type • AnnouncI_ID
27.	Claims	• ID • Subject • Content • Stud_ID • Staff_ID • Mod_ID

User						
ID	Fname	Lname	Password	Img_name	Department	Mail

Student			
ID	Semester	Status	Year

Staff		
ID	Profession	Role_ID

Study						
Mod_ID	Stud_ID	Hr_week_NO	Last_view	Grade	Semester_No	Enroll_Date

Teach			
Mod_ID	Staff_ID	Last_Update	Is_Creator

Phone		
Phone_no	Is_Confirmed	User_ID

Role					
Role_ID	Insert	Delete	Update	Edit_User	Add_User

Address				
User_ID	City	Zip	Street_NO	Region

Module			
ID	Name	Specifics	Weeks_NO

Task							
ID	Open_date	Deadline	Attempts_No	type	Weight	Group_num	Mod_ID

Submission			
Stud_ID	Task_ID	Grade	Comment

Past_Exams				
ID	Title	Date	Creator	Mod_ID

Week					
ID	Week_No	Media_src	Study_ID	Comment	Mod_ID

Course_Overview					
ID	title	Progress	IMG_name	Semester_NO	Mod_link

Mod_Evaluation									
ID	Mod_Rate	Prof_Rate	TA_Rate	Date	Comment	Stud_ID	Mod_ID	prof_ID	TA_ID

Exam_TT					
ID	Year	Semester	File_ID	Publish_Date	Stud_ID

Online_pay					
ID	Amount	Pay_Date	Academic_Year	Trans-type	Stud_ID

Summer_Prog					
ID	Title	Duration	Description	Available_Num	Teacher_ID

StudHub_Enroll			
Stud_ID	Hub_ID	Enroll_date	Is_online

Student_Hub			
Prog_link	Hub_ID	IMG_src	Instructor_ID

Sum_enroll				
Stud_ID	Sum_ID	progress	Certificate_Img	Enroll_DATE

Announcements					
ID	Subject	Content	File_ID	Mod_ID	Stuff_ID

Announc_File				
ID	Name	Upload_Date	Size	Announc_ID

Claims					
ID	Subject	Content	Stud_ID	Stuff_ID	Mod_ID

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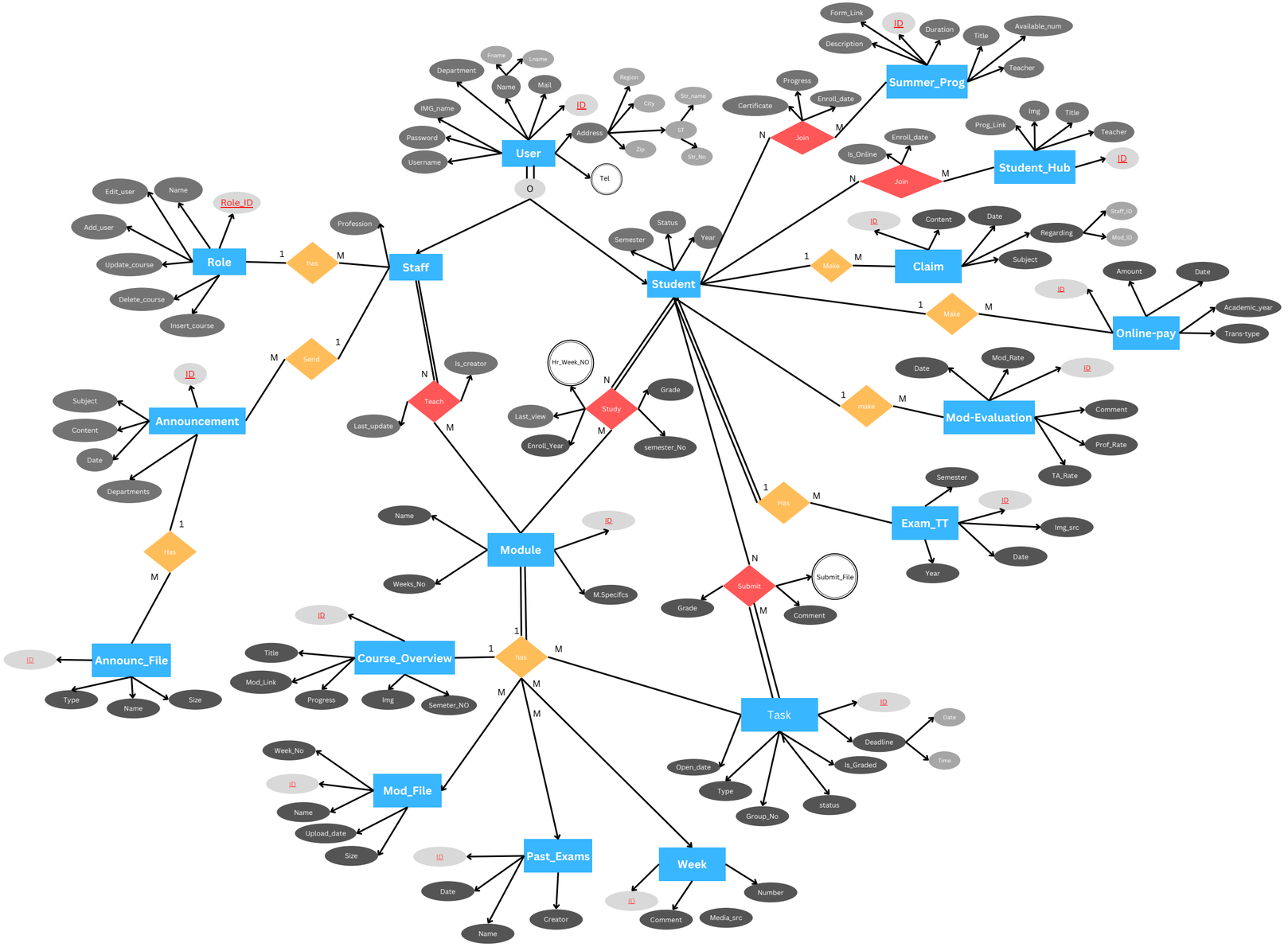
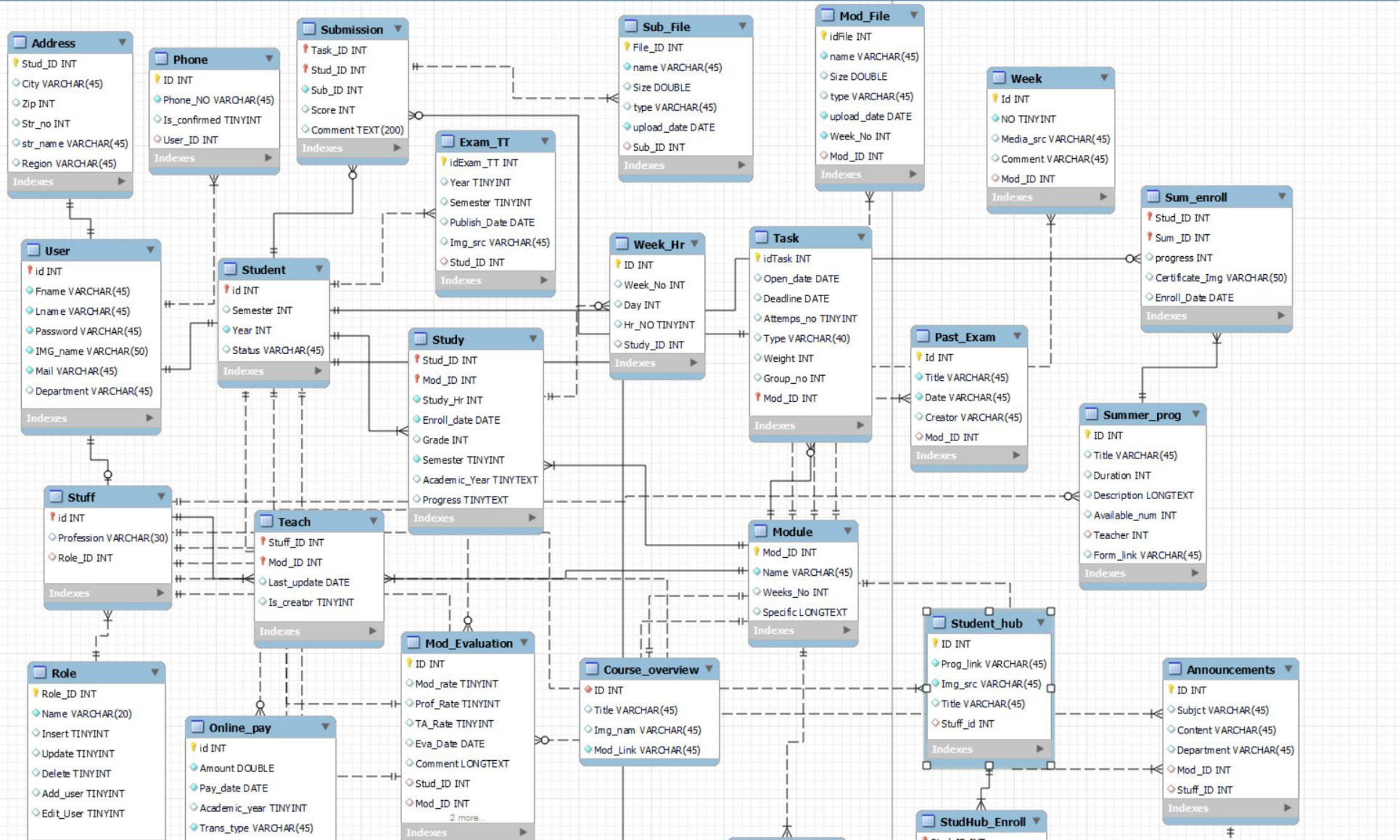

User
Fname
Lname
Department
Name
Mail
ID
IMG_name
Password
Username
Address
Region
City
Str_name
ST
Zip
Str_No
Tel
O
Role
Edit_user
Name
Role_ID
Add_user
Update_course
Delete_course
Insert_course
has
Profession
Staff
Send
Announcement
ID
Subject
Content
Date
Departments
Has
Announc_File
ID
Type
Name
Size
Teach
Is_creator
Last_update
Hr_Week_NO
Study
Grade
Last_view
Enroll_Year
semester_No
Module
ID
Name
Weeks_No
M.Specifcs
Course_Overview
ID
Title
Mod_Link
Progress
Img
Semeter_NO
has
Mod_File
Week_No
ID
Name
Upload_date
Size
Past_Exams
ID
Date
Name
Creator
Week
ID
Number
Comment
Media_src
Student
Semester
Status
Year
Summer_Prog
Form_Link
ID
Duration
Title
Available_num
Description
Teacher
Join
Progress
Certificate
Enroll_date
Student_Hub
Prog_Link
Img
Title
Teacher
ID
Join
Is_Online
Enroll_date
Make
Claim
ID
Content
Date
Regarding
Staff_ID
Mod_ID
Subject
Make
Online-pay
Amount
Date
ID
Academic_year
Trans-type
make
Mod-Evaluation
Date
Mod_Rate
ID
Comment
Prof_Rate
TA_Rate
Has
Exam_TT
Semester
ID
Img_src
Date
Year
Submit
Submit_File
Grade
Comment
Task
ID
Deadline
Date
Time
Is_Graded
Open_date
Type
Group_No
status


Address
Stud_ID INT
City VARCHAR(45)
Zip INT
Str_no INT
str_name VARCHAR(45)
Region VARCHAR(45)
Indexes
Phone
ID INT
Phone_NO VARCHAR(45)
Is_confirmed TINYINT
User_ID INT
Indexes
Submission
Task_ID INT
Stud_ID INT
Sub_ID INT
Score INT
Comment TEXT(200)
Indexes
Sub_File
File_ID INT
name VARCHAR(45)
Size DOUBLE
type VARCHAR(45)
upload_date DATE
Sub_ID INT
Indexes
Mod_File
idFile INT
name VARCHAR(45)
Size DOUBLE
type VARCHAR(45)
upload_date DATE
Week_No INT
Mod_ID INT
Indexes
Week
Id INT
NO TINYINT
Media_src VARCHAR(45)
Comment VARCHAR(45)
Mod_ID INT
Indexes
Exam_TT
idExam_TT INT
Year TINYINT
Semester TINYINT
Publish_Date DATE
Img_src VARCHAR(45)
Stud_ID INT
Indexes
Sum_enroll
Stud_ID INT
Sum_ID INT
progress INT
Certificate_Img VARCHAR(50)
Enroll_Date DATE
Indexes
User
id INT
Fname VARCHAR(45)
Lname VARCHAR(45)
Password VARCHAR(45)
IMG_name VARCHAR(50)
Mail VARCHAR(45)
Department VARCHAR(45)
Indexes
Student
id INT
Semester INT
Year INT
Status VARCHAR(45)
Indexes
Week_Hr
ID INT
Week_No INT
Day INT
Hr_NO TINYINT
Study_ID INT
Indexes
Task
idTask INT
Open_date DATE
Deadline DATE
Attemps_no TINYINT
Type VARCHAR(40)
Weight INT
Group_no INT
Mod_ID INT
Indexes
Past_Exam
Id INT
Title VARCHAR(45)
Date VARCHAR(45)
Creator VARCHAR(45)
Mod_ID INT
Indexes
Study
Stud_ID INT
Mod_ID INT
Study_Hr INT
Enroll_date DATE
Grade INT
Semester TINYINT
Academic_Year TINYTEXT
Progress TINYTEXT
Indexes
Summer_prog
ID INT
Title VARCHAR(45)
Duration INT
Description LONGTEXT
Available_num INT
Teacher INT
Form_link VARCHAR(45)
Indexes
Stuff
id INT
Profession VARCHAR(30)
Role_ID INT
Indexes
Teach
Stuff_ID INT
Mod_ID INT
Last_update DATE
Is_creator TINYINT
Indexes
Module
Mod_ID INT
Name VARCHAR(45)
Weeks_No INT
Specific LONGTEXT
Indexes
Student_hub
ID INT
Prog_link VARCHAR(45)
Img_src VARCHAR(45)
Title VARCHAR(45)
Stuff_id INT
Indexes
Mod_Evaluation
ID INT
Mod_rate TINYINT
Prof_Rate TINYINT
TA_Rate TINYINT
Eva_Date DATE
Comment LONGTEXT
Stud_ID INT
Mod_ID INT
2 more...
Indexes
Course_overview
ID INT
Title VARCHAR(45)
Img_nam VARCHAR(45)
Mod_Link VARCHAR(45)
Announcements
ID INT
Subjct VARCHAR(45)
Content VARCHAR(45)
Department VARCHAR(45)
Mod_ID INT
Stuff_ID INT
Indexes
Role
Role_ID INT
Name VARCHAR(20)
Insert TINYINT
Update TINYINT
Delete TINYINT
Add_user TINYINT
Edit_User TINYINT
Online_pay
id INT
Amount DOUBLE
Pay_date DATE
Academic_year TINYINT
Trans_type VARCHAR(45)
StudHub_Enroll