Assignment - 3

To design and implement a relational database management system for xyz university.

To access the issues at xyz university, designing a relational database management system (RDBMS) involves several key steps: understanding requirements, defining entities and relationships, creating an entity-relationship diagram and normalizing the database schema.

Requirement analysis :-

1) Entities and Attributes :-

→ students :- student_id, first_name, last_name, date of birth, email

→ courses :- course_id, course_name, course_description, credits

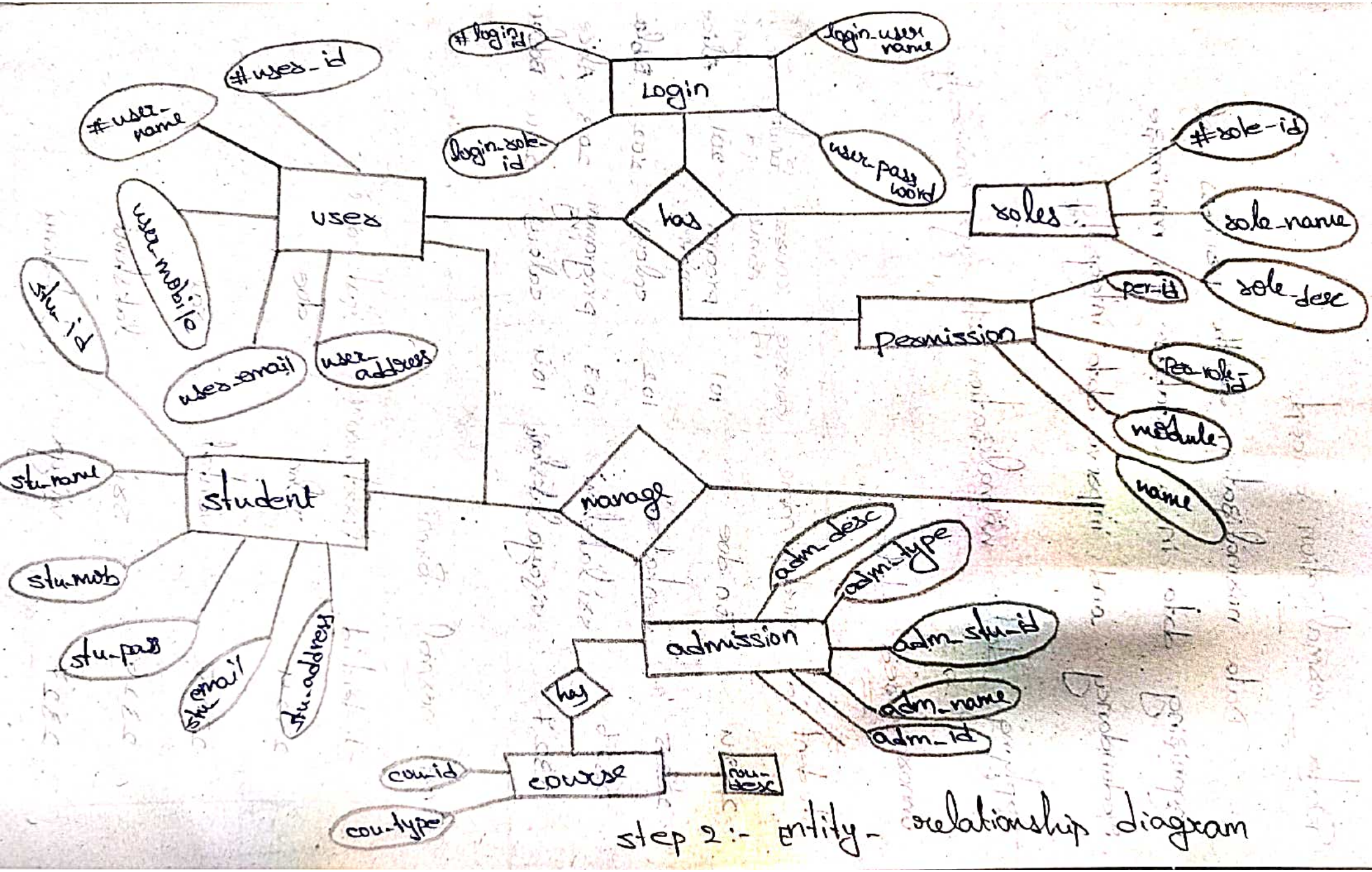
→ Faculty :- faculty_id, first_name, last_name, email, department

→ Enrollments :- enrollment id, course id

→ Assignments :- course id, assignment_title, due_date, grade

2) Relationships:-

- A student can enroll in multiple courses - one to many.
- A course can have multiple students enrolled - one to many.
- A faculty member can teach multiple courses - one to many.
- A course can taught by multiple faculty members - one to many.
- A course can have multiple assignments - one to many.
- Assignments are given to students and they recieve grades - one to many.



step 2 :- entity- relationship diagram

Data normalization concept:-

Data normalization is the process of organizing data in a database to minimize redundancy and improve data integrity

Applying data normalization to xyz university:-

unnormalized data

student id	student name	course id	course name	faculty id	faculty name
2324	John doe	101	programming	201	Alice
2325	venkat sai	102	calcus	202	Bobby
2326	sri lakshmi	103	programming	203	Alice
2327	vijaya lakshmi	104	calcus	204	Bobby

First normal form:-

student id	first name	last_name
2324	john	doe
2325	venkat	sai
2326	sri	lakshmi
2327	vijaya	lakshmi

Faculty:-

Faculty id	Faculty_name
201	Alice
202	Bob lee
203	Alice
204	Boblee

Assignments:-

Assignment_id	assignment_title
1	mid_term exam
2	final project
3	mid_term exam
4	final project

second Normal form (2NF)

Enrollments:-

Enrollment id	student_id	course_id	enrollment_date
1	2324	101	2024-07-10
2	2325	102	2024-07-11
3	2326	103	2024-07-10
4	2327	104	2024-07-11

Assignments:-

Assignment id	course id	faculty id	due_date	grade
1	101	201	2024-6-15	A
2	102	202	2024-6-14	B
3	103	203	2024-6-15	A
4	104	204	2024-6-14	A

third form of Normal:

students :-

student id	first_name	last_name	DOBirth	email
2324	John	doe	2000-01-15	Johndoe@example.com
2325	venkat	sai	2000-2-20	venkat@example.com
2326	ssi	lakshmi	2000-3-10	ssi@example.com
2327	vijaya	lakshmi	2000-4-18	vijaya@example.com

courses:-

course-id	course-name	course_description	credits
101	introduction to programming	Basic - programming concepts	3
102	calcus 1	fundamental calcus	4
103	introduction to programming	Programming concepts	3
104	calcus 1	fundamental calcus	4

Enrollments:-

Enrollment-id	student-id	course-id	enrollment date
1	2324	101	2024-07-10
2	2325	102	2024-07-11
3	2326	103	2024-07-10
4	2327	104	2024-07-11

Assignments:-

Assignment id	course id	faculty id	assignment title	due date	grade
1	101	201	mid-term exam	2024-6-15	A
2	102	202	final project	2024-6-14	B
3	103	203	mid term exam	2024-6-15	A
4	104	204	final project	2024-6-14	A