TEZPUR UNIVERSITY

PROJECT REPORT ON
"An information system for the under graduate student of TU "

MCA 2nd Semester
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Database Management Systems

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INTRODUCTION AND OVERVIEW

Introduction:

The information system of the undergraduate students of Tezpur University, as the name suggests, is based on the design of a database of the students which contains all the information of the same. This design will help the authorities manage and maintain the students' information easily.

Problem definition:

The main task of this project is to design the database in such a way that it avoids data redundancy and anomalies. This will make the database more efficient and easier to use by the concerned authorities.
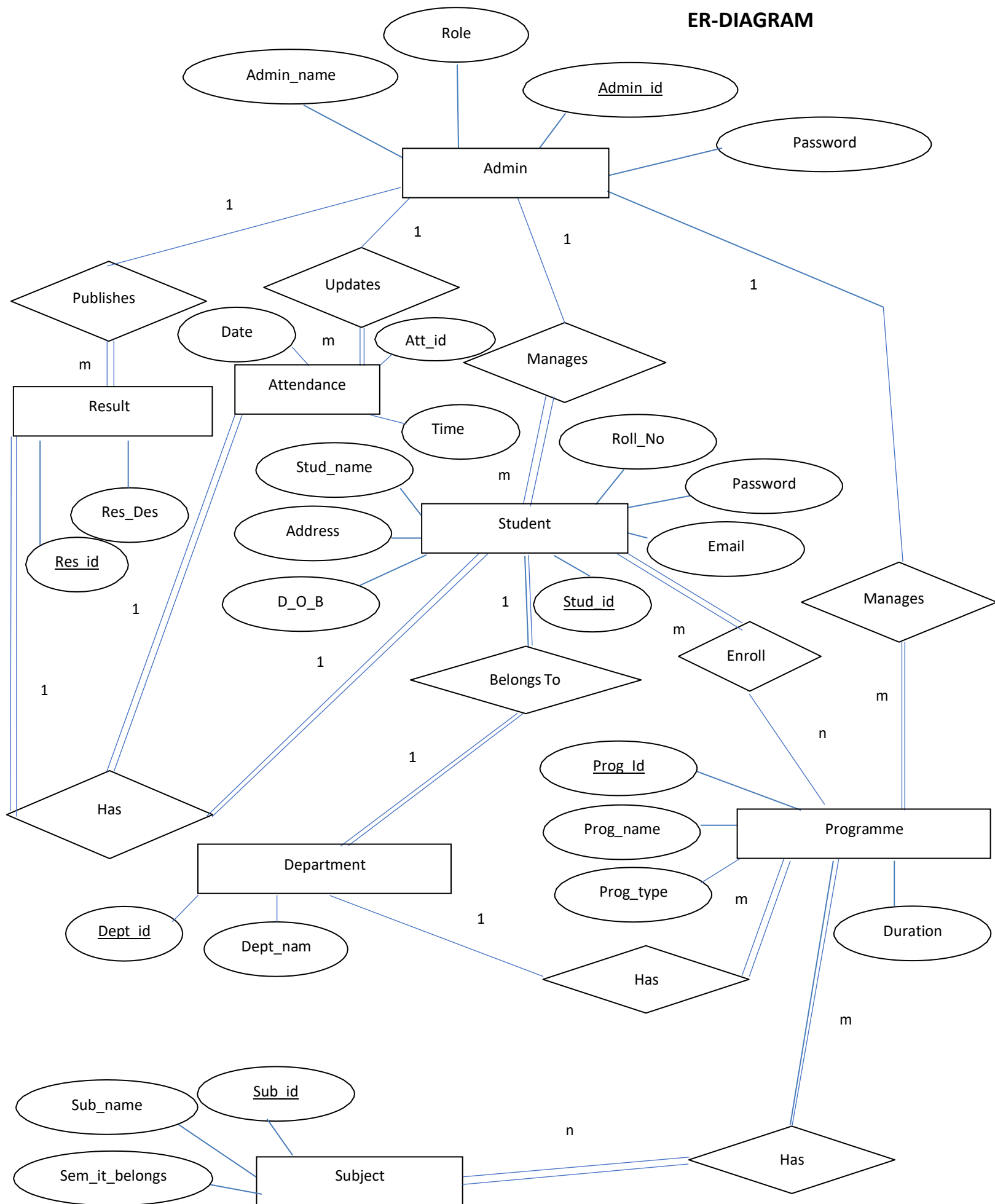
The Entity Relationship (ER) diagram of the above-mentioned project will contain a total of 7 entities, which are named "Admin", "Attendance", "Result", "Student", "Department", "Programme", and "Subject". The student entity will have several attributes containing basic information like name, roll number, etc., as well as some extended information. The department entity will contain the attributes with its information. The programme entity will contain the attributes and information about the different programmes offered by each department of Tezpur University. The entity admin will manage the other entities and have the basic information like admin name, role admin ID, etc.

A student enrols in a programme offered by one of the departments. Many programmes can have a large number of subjects that are managed by the admin. Many students can enrol in one or more programmes, and the student entity will have the result. The attendance entity will be updated by the admin for any particular student.

Assumptions Taken:

- The Programme type attribute is always fixed to UNDERGRADUATE(i.e., UG)
- All the courses listed will be of UNDERGRADUATE level belongingTezpur University.
- Admin is not a single person they vary based on role (like it may befaculty or any other person with responsibility).

ER-DIAGRAM

Role

Admin_name

Admin_id

Password

Admin

Publishes

Updates

Date

Att_id

Manages

Attendance

Time

Result

Stud_name

Roll_No

Res_Des

Address

Password

Res_id

Student

Email

D_O_B

Stud_id

Manages

Belongs To

Enroll

Has

Prog_Id

Prog_name

Programme

Department

Prog_type

Dept_id

Duration

Dept_nam

Has

Sub_id

Sub_name

Sem_it_belongs

Subject

Has

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RELATIONAL MAPPING OF ER MODEL

ADMIN

Admin_id	Admin_name	Role	Password

STUDENT

Stud_id	Stud_name	RollNo	Email	password	D_O_B	Address	Dept_id	Admin_id

DEPARTMENT

Dept_id	Dept_name

PROGRAMME

Prog_id	Prog_name	Prog_Type	Duration	Dept_id	Admin_id

SUBJECT

Sub_id	Sub_name	Sem_it_belongs

PROG_SUB

Prog_id	Sub_id

ATTENDANCE

Att_id	Date	Time	Stud_id	Admin_id

RESULT

Res_id	Res_Desc	Stud_id	Admin_id

PROG_ENROLLED

Stud_id	Prog_Id
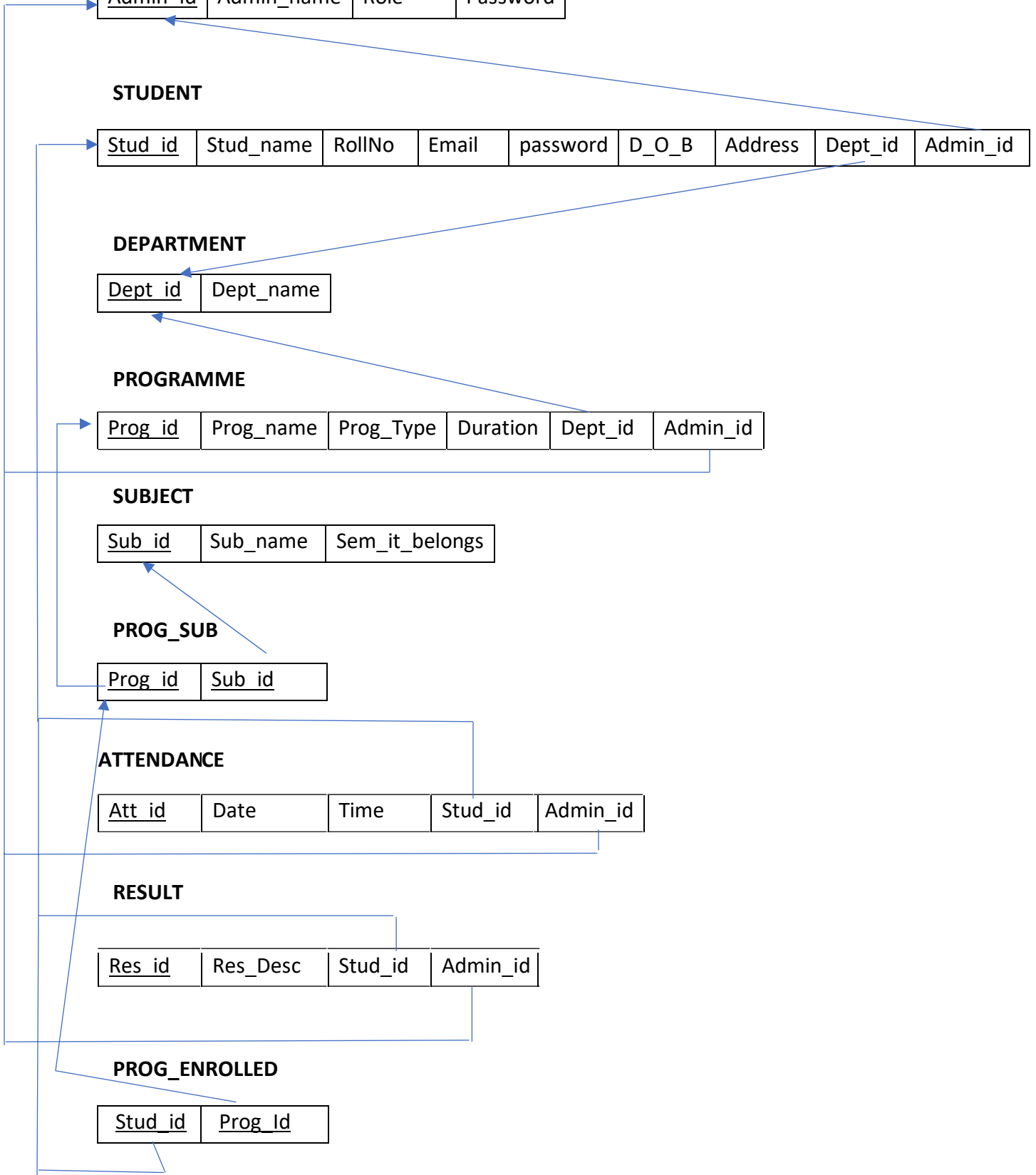
FUNCTIONAL DEPENDENCIES AND NORMAL FORM OF THE ABOVE SCHEMAS

1. ADMIN:

Admin_id	Admin_name	Role	Password

FD1: Admin_id -> {Admin_name, Role, Password}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

2. STUDENT:

Stud_id	Stud_name	RollNo	Email	password	D_O_B	Address	Dept_id	Admin_id

FD1: Stud_id -> {Stud_name, RollNo, Email, Password, D_O_B, Address, Dept_id, Admin_id}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

3. DEPARTMENT:

Dept_id	Dept_name

FD1: Dept_id -> {Dept_name}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So it is in BCNF.

So BCNF is the highest normal form.

4. PROGRAMME

Prog_id	Prog_name	Prog_Type	Duration	Dept_id	Admin_id

FD1: Prog_id -> {Prog_name, Prog_Type, Duration, Dept_id, Admin_id}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

5. SUBJECT:

Sub_id	Sub_name	Sem_it_belongs

FD1: Sub_id -> {Sub_name, Sem_it_belongs}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

6. PROG_SUB

Prog_id	Sub_id

MVD1: Prog_id ->> {Sub_id}

As there is no non-trivial MVD in PROG_SUB, it is in 4NF.

So 4NF is the highest normal form.

7. ATTENDANCE:

Att_id	Date	Time	Stud_id	Admin_id

FD1: Att_id -> {Date, Time, Stud_id, Admin_id}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

8. RESULT:

Res_id	Res_Desc	Stud_id	Admin_id

FD1: Res_id -> {Res_Desc, Stud_id, Admin_id}

There is no multivalued attribute, so it is in 1NF.

There is no partial key dependency so it is in 2NF.

There is no transitive dependency so it is in 3NF.

For X -> Y, X is a super key. So, it is in BCNF.

So BCNF is the highest normal form.

9. PROG_ENROLLED

Stud_id	Prog_Id

MVD: Stud_id ->> {Prog _id}

As there is no non-trivial MVD in PROG_ENROLLED, it is in 4NF.

So 4NF is the highest normal form.