

# **Database Systems Assignment**

**Topic: An Information System for the  
Undergraduate students of Tezpur  
University.**

**Submitted By:**

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# Introduction:

A **Student Information System** is used to record, modify and maintain student data therefore enabling easy access of this data to students themselves as well as parents, faculties and various departments of an educational institution. Such an information system may cover many aspects regarding a student such as registered courses, transcripts, results of student tests, participation in extra-curricular activities, attendance, etc. A competent implementation must also be able to maintain historical data in addition to the present information regarding all such aspects. With the above things in mind, here we propose a data model for our database application which tries to fulfil the following objectives:

1. Automation of information management from pen-paper based to absolute computer-based web-interface supported by a database at its back.
2. To provide an implementation that can be extended as the need arises.
3. To provide an easy to access and user-friendly yet effective interface.
4. To satisfy as many different user segments, for e.g., parents, University administration, students, etc., as possible by the information they need.
5. To support a one-stop service and access environment, i.e., to make all information available from a single source.
6. The implementation must output reports that are easy to decipher.

Hence, here we aim at providing an information system to be used by University administration as well as students, parents, etc. Centralized information sourcing and management would allow the data to be consistent at all times. Implementing more extensive features such as accounting and finance, extra-curricular activity tracking, etc., would extend its scope to a much wider audience and also help in areas such as scheduling of examinations, course registration/ admission of students, centralised accounting and billing, managing placement services, etc., effectively.

# **Problem Description:**

Here we describe our database model called UNDERGRADUATE STUDENT INFORMATION SYSTEM. Also, we list the data requirements for our database model.

The database keeps track of students of an undergraduate programme and their details. The following describes the part of the miniworld that the database model represents.

- Each student is enrolled in a programme which is offered by some department under a specific school. Each student is identified by a unique roll no., programme by its unique name and department by a department id. A school is identified by a unique name and may consist of many departments.
- The academic performance of a student in the current semester for every course is recorded. The courses opted by a student in the current semester must be offered by some department. Performance of each student in previous semesters, if any, is also to be tracked.
- Attendance record of each student in every course taken in the current semester is to be kept track of.
- Record of hostel seat allocated to a student is also to be tracked. A student may or may not be allocated a hostel seat.

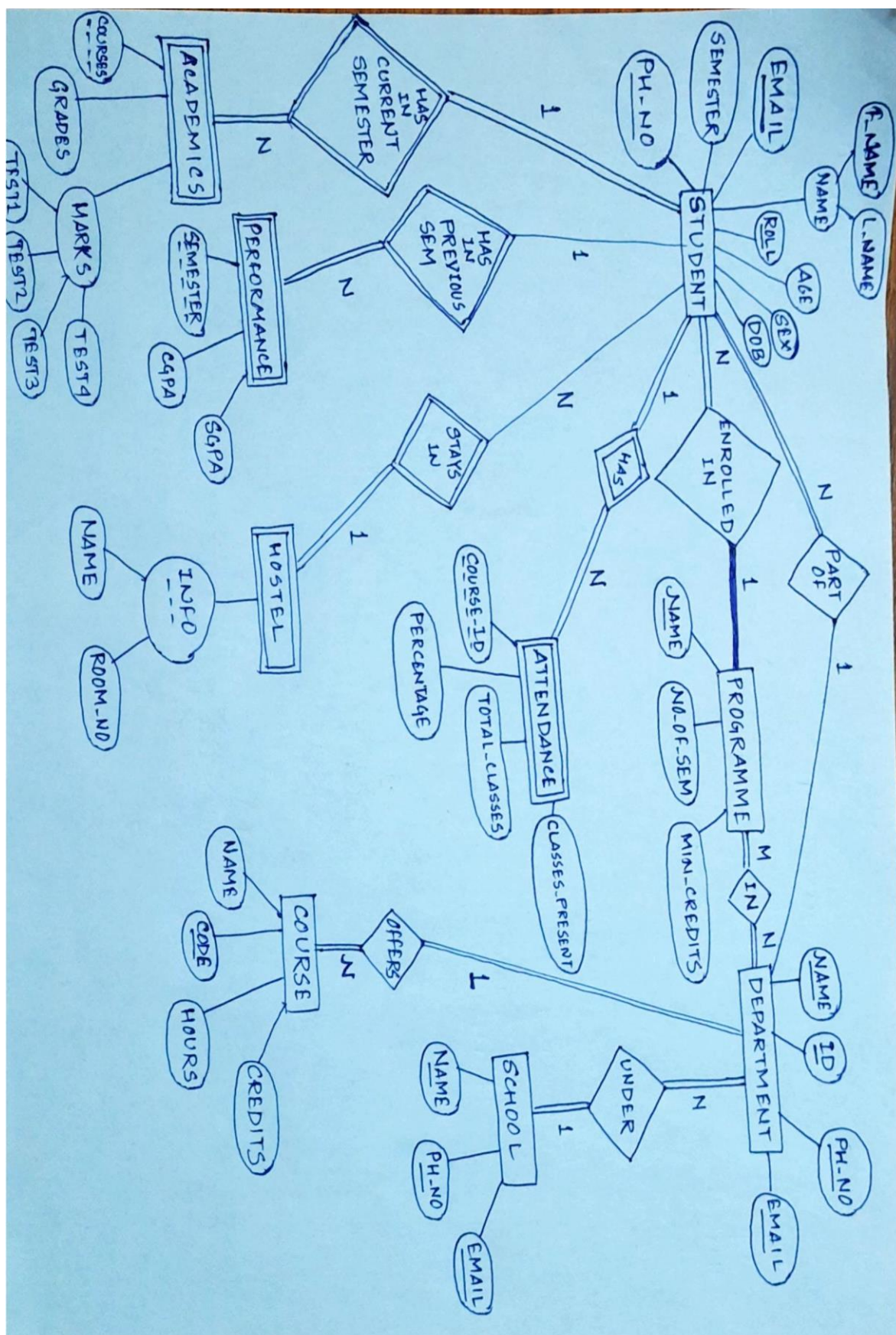
According to user requirements mentioned above, we aim at providing at least a basic functional student information system by generating the following reports from our web-interfaced database application:

- Reports providing information about individual entities such as students, departments, schools, etc.
- Reports regarding academic information of a student such as programme, department, school, etc.
- Reports providing academic performances of the student both in the current and past semesters.
- Reports for generating attendance of students in the current semester will also be provided.
- For the ease of the students, we may also include reports providing details of courses offered by the various departments for the current semester and programme of the student.
- A report for generating hostel details of an entity, if any, will also be provided.

In all of the above cases, the web-interface user may be interested in only a particular student or only a particular attribute of a student. The reports generation will be tuned to take into account both of these cases for better report generation for the user.

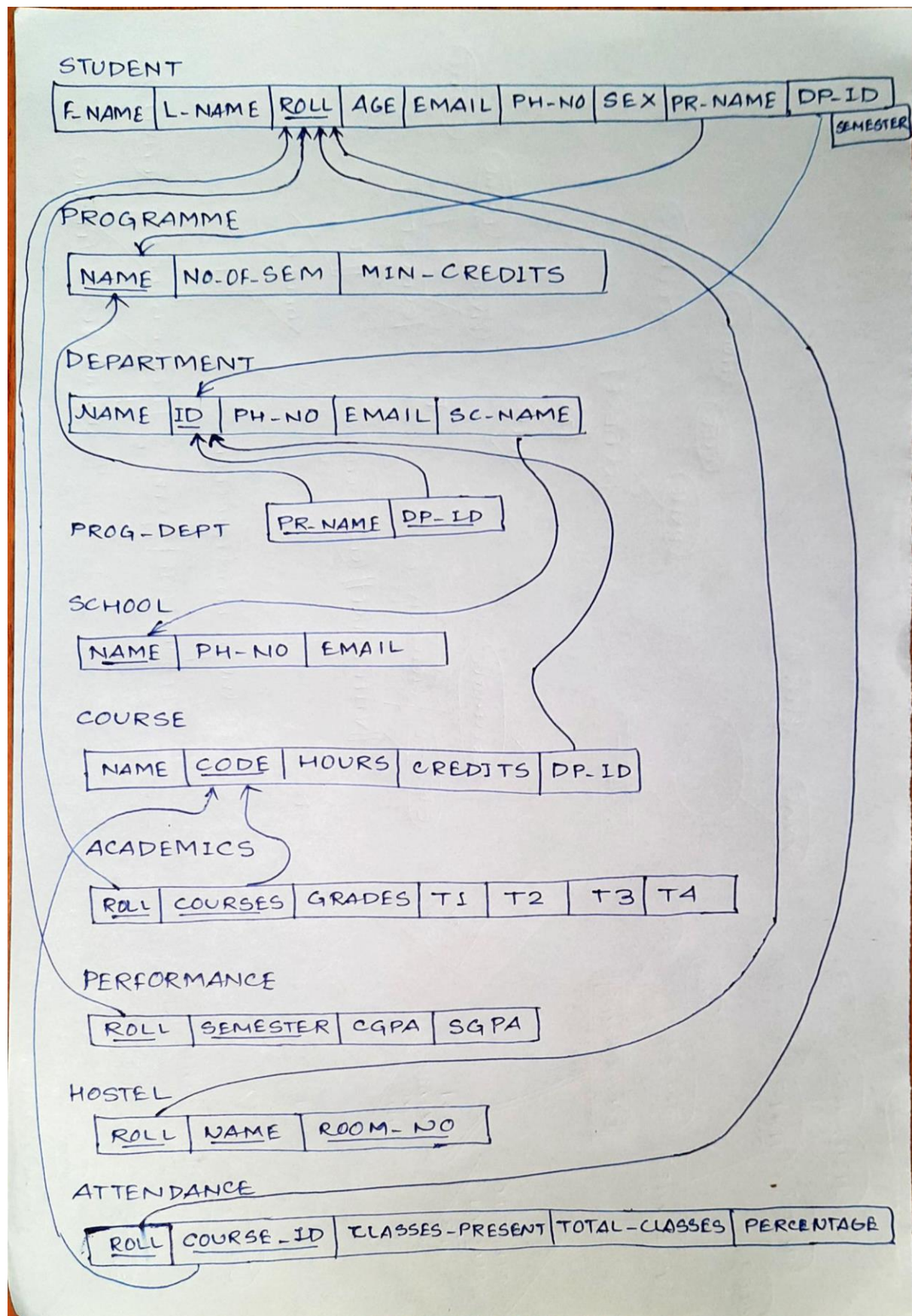
These basic reports we aim to provide our prospective users. We may also extend our application to include more such reports as the need arises.

## ER Model:





# Relational Model:



# Functional Dependencies:

STUDENT

<u>ROLL</u>	F-NAME	L-NAME	AGE	EMAIL	PH-NO	SEX	SEMESTER	PR-NAME	DP-ID
	↑	↑	↑	↑	↑	↑	↑	↑	↑
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

PROGRAMME

<u>NAME</u>	NO-OF-SEM	MIN-CREDITS
	↑	↑

DEPARTMENT

<u>NAME</u>	<u>ID</u>	PH-NO	EMAIL	SC-NAME
↑	↑	↑	↑	↑
↑	↑	↑	↑	↑
↑	↑	↑	↑	↑
↑	↑	↑	↑	↑

PROG-DEPT

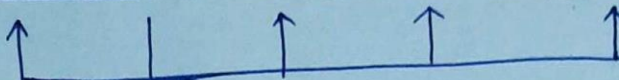
<u>PR-NAME</u>	<u>DP-ID</u>
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SCHOOL


<u>NAME</u>	PH-NO	EMAIL
↑	↑	↑
↑	↑	↑
↑	↑	↑




## COURSE

<u>NAME</u>	<u>CODE</u>	HOURS	CREDITS	DP-ID
				

## ACADEMICS

<u>ROLL</u>	<u>COURSES</u>	GRADES	T1	T2	T3	T4
						

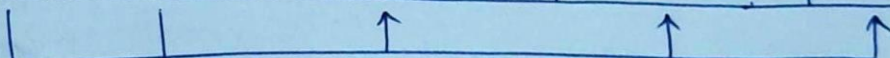
## PERFORMANCE

<u>ROLL</u>	<u>SEMESTER</u>	C GPA	SGPA
			

## HOSTEL

<u>ROLL</u>	<u>NAME</u>	<u>ROOM-NO</u>
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## ATTENDANCE

<u>ROLL</u>	<u>COURSE_ID</u>	CLASSES-PRESENT	TOTAL-CLASSES	PERCENTAGE
				



## **Normalization:**

The relations have the functional dependencies as shown above. Using these, we have determined the highest normal form for all the relations. All the relations above were already in BCNF and therefore they didn't require any sort of intermediate normalization.