EDGE BU CSE DIGITAL SKILLS TRAINING

Course Name: Database Management system (DBMS)
Batch No.-02

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Submitted to:
Md Samsuddoha
Assistant Professor
Dept. of Computer Science & Engineering
University of Barishal

Prepared By:
Fahmida Akter
Roll no.: 05-002-23
3rd year
Dept. of Biochemistry & Biotechnology
University of Barishal.

Assignment 1

1. Designing (Entity Relationship) ER Diagram

We have to develop a database for a company including some information of departments, employees and projects of the company. As mentioned, that every department has many employees and each employee work for a department and each department is leading by only one manager who is also an employee. Initially a new department need not have any employee. Here, though an employee belongs a department but they can work for different projects at the same time

Step 1: Identify Entities

We have to develop a database for a company including some information of departments, employees and projects of the company. As mentioned, that every department has many employees and each employee work for a department and each department is leading by only one manager who is also an employee. Initially a new department need not have any employee. Here, though an employee belongs a department but they can work for different projects at the same time

List of Entities:

1. Department
2. Employee
3. Project

Step 2: Identify Attributes and Primary key for each entity

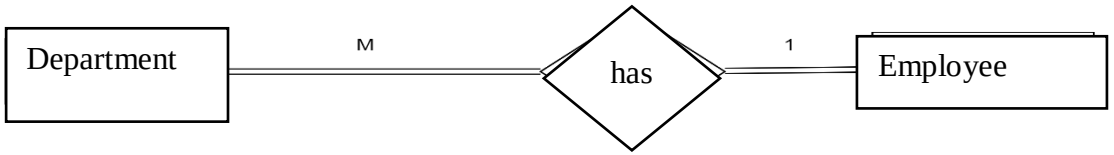
Employees (name, email, phone, address, dob, gender, designation, salary, **employee_id**)
Departments (**id**, name, number, locations, num_of_employee, hod, manager_id)
Projects (**id**, name, num_of_employee, description,department_id)

Step 3: Identify Relationship needed

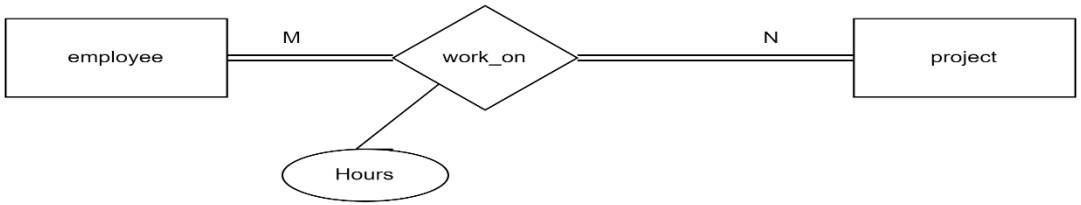
1. Department Has Employee
2. Employee Manages Department
3. Employees work_on Project
4. Department Leads Project

Step 4: Cardinality Ratio and Participation (Constraints)

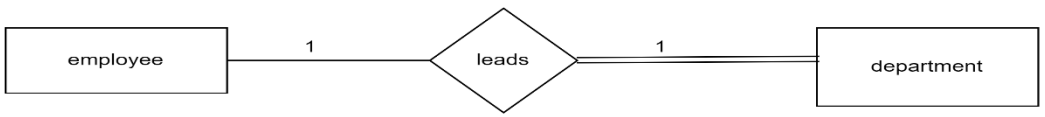
Employees work_for Department



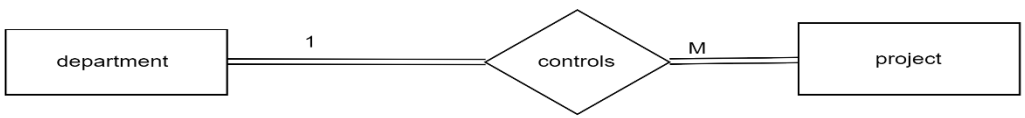
Employees works_on Projects

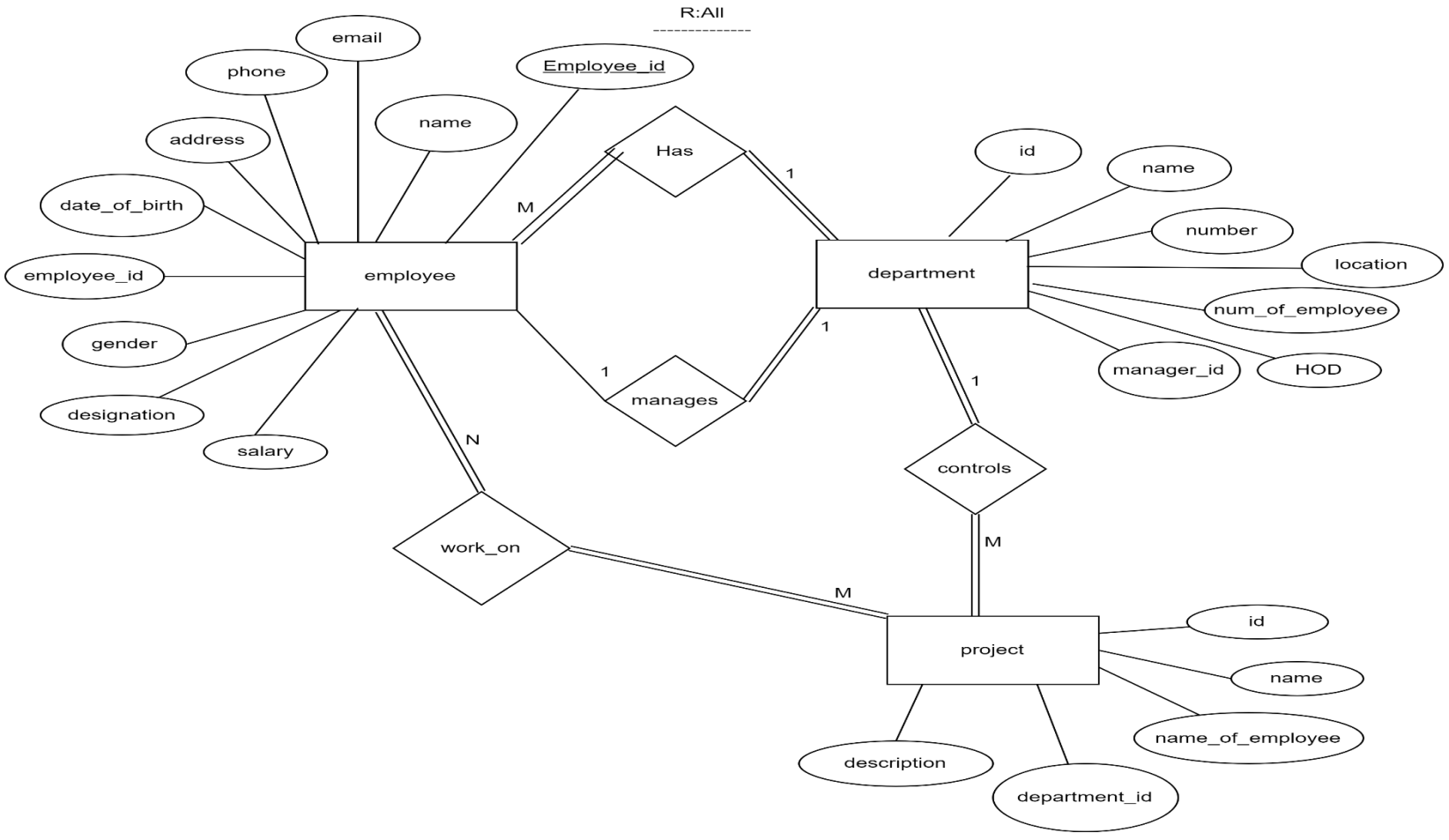


Employees(Manager) leads Department



department controls project




R:All
email
phone
Employee_id
name
address
Has
1
id
name
date_of_birth
M
number
employee_id
employee
department
location
num_of_employee
gender
1
1
manager_id
HOD
designation
manages
1
salary
N
controls
work_on
M
M
id
project
name
name_of_employee
description
department_id

Assignment 2

University Management System

1. Designing (Entity Relationship) ER Diagram

We have to develop ER diagram for a university management system database involves designing a structured database that can handle various aspects of university operations, including student information, courses, faculty, enrollment, and more.

Step 1: Identify Entities

1.Student

2.Course

3. Faculty

4. Department

5. Enrollment

6.Classroom

7. Examination

8.Program

9.Schedule

10.Scholarship

11.Staff

Step-2: Identify the Attributes and Primary key for each Entity

1.Student: **student_id (primary key),** name, Gender, Date_Of_Birth, Email, Phone_number, Address, Enrollment_Date, Department_ID, Program_ID

2. Faculty: **Faculty_ID (Primary Key)**, Name, Date_Of_Birth, Email, Phone_number, Address, Hire_Date, Department_ID, Rank, Salary

3. Department: **Department_ID (Primary Key)**, Department_name, Head_Of_Department, Location, Phone_number

4. Program: **program_id (Primary Key),** program_name, department_id, degree_type

5. course**: course_id (Primary Key),** course_name, course_code, credits, department_id, faculty_id

6. Enrollment: **enrollment_id (Primary Key),** student_id, course_id, semester

7.Classroom: **classroom_id (Primary Key),** room_number, building_name, capacity

8. Examination: **exam_id (Primary Key),** course_id, exam_date, start_time, end_time, classroom_id

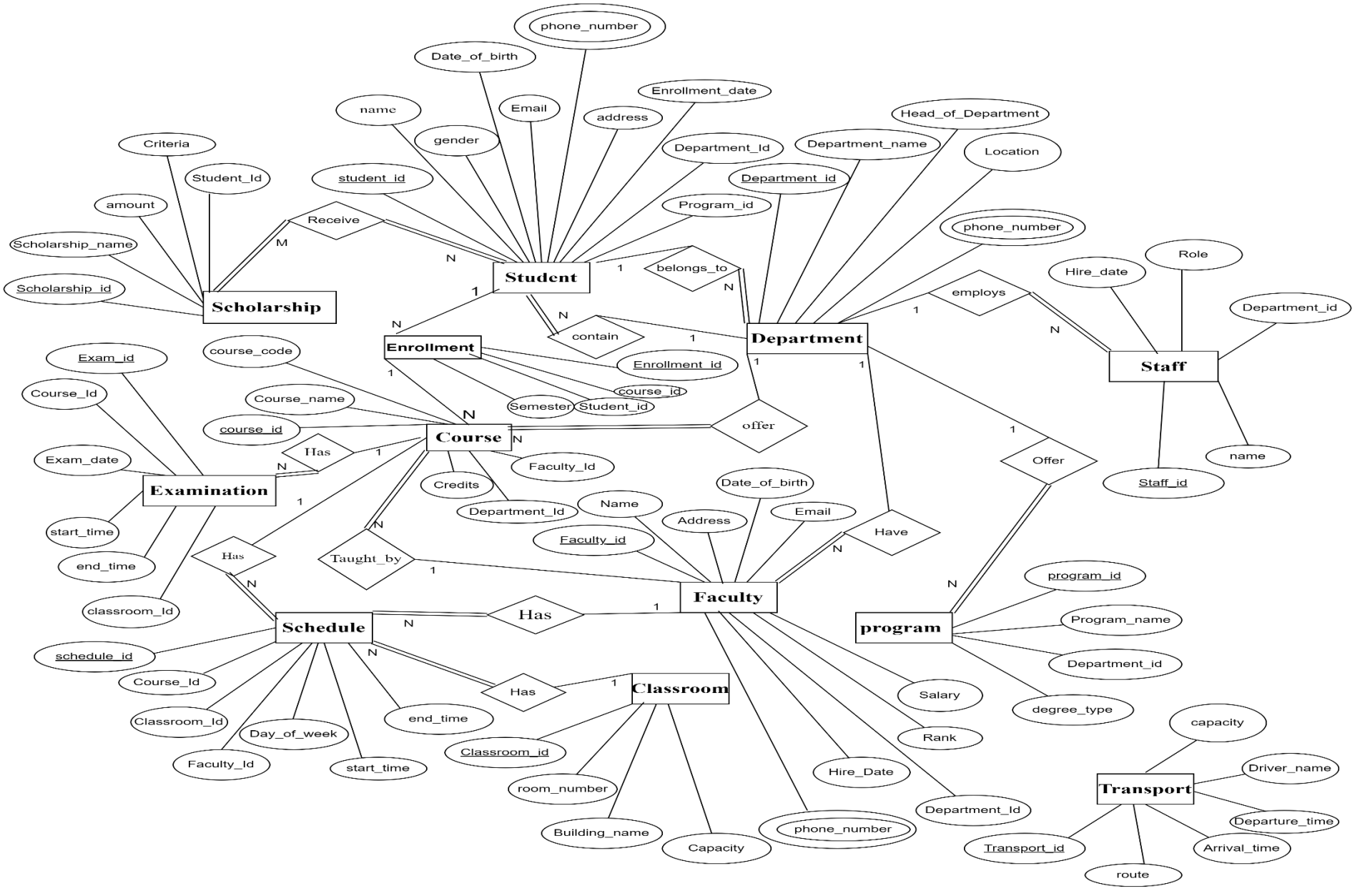
9.Schedule: **schedule_id (Primary Key),** course_id, classroom_id, faculty_id, day_of_week, start_time, end_time

10.Scholarship: **scholarship_id (Primary Key),** scholarship_name, amount, criteria, student_id

11.Staff: **staff_id (Primary Key),** name, department_id, role, hire_date

Step 3: Identify Relationship needed

1. Student belongs_to department
2. Student enrolls_in courses
3. Faculty Teaches courses
4. Faculty belongs_to department
5. Department Have faculty
6. Department offer courses
7. Department contain student
8. Department offer Program
9. Course Taught_by faculty
10. Course Has Examination
11. Course Has Schedule
12. Faculty has schedule
13. Classroom Has Schedule
14. Student Receive Scholarship
15. Department employs staff


phone_number
Date_of_birth
name
Email
Enrollment_date
address
gender
Department_Id
Head_of_Department
Department_name
Location
Criteria
Student_Id
student_id
Department_id
amount
Program_id
Receive
phone_number
Scholarship_name
Student
belongs_to
Role
Hire_date
Scholarship_id
employs
Department_id
Scholarship
Enrollment
contain
Department
Staff
Exam_id
course_code
Enrollment_id
course_id
Course_Id
Course_name
Semester
Student_id
course_id
offer
Offer
name
Exam_date
Has
Credits
Faculty_Id
Staff_id
Examination
Department_Id
Name
Date_of_birth
Address
Email
start_time
Faculty_id
Have
end_time
Has
Taught_by
Faculty
program_id
classroom_Id
Has
program_name
Schedule
Department_id
schedule_id
degree_type
Course_Id
Salary
Has
Classroom
Classroom_Id
end_time
Rank
Day_of_week
Classroom_id
Faculty_Id
start_time
Hire_Date
capacity
Driver_name
room_number
Transport
Department_Id
Building_name
phone_number
Departure_time
Capacity
Transport_id
Arrival_time
route

Assignment 3

Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.

1. Designing (Entity Relationship) ER Diagram

Step 1: Identify Entities

- Customer
- Car
- Accident
- Insurance_Policy
- Payment

Step 2: Identify the Attributes and Primary key for each Entity

- **Customer**: Represents the customers of the car insurance company. Attributes include:
  - Customer_ID (Primary Key), Name, Address, Phone_Number
- **Car**: Represents the cars owned by the customers. Attributes include:
  - Car_ID (Primary Key), License_Plate_Number, Make, Model, Year,customer_id

- **Accident**: Represents recorded accidents associated with cars. Attributes include:
  - Accident_ID (Primary Key), Date, Location, Description, customer_id, policy_id
- **Insurance_Policy**: Represents the insurance policies that cover one or more cars. Attributes include:
  - Policy_ID (Primary Key), Policy_Number, Start_Date, End_Date, Coverage_Amount,customer_id
- **Payment**: Represents the premium payments for the insurance policies. Attributes include:
  - Payment_ID (Primary Key), Amount, Due_Date, Received_Date, Period, policy_id, customer_id

Step 3: Identify Relationship needed

- **Customer-Owns-Car**

  Relationship: One-to-Many (Customer to Car).
- **Car-Involved_in-Accident**

  Relationship: One-to-Many (Car to Accident).
- **Policy-Covers-Car**

  Relationship: One-to-Many (Insurance_Policy to Car).
- **Policy-Has-Payment**

Relationship: One-to-Many (Insurance_Policy to Payment).

Step-4:ER Diagram