Database Project

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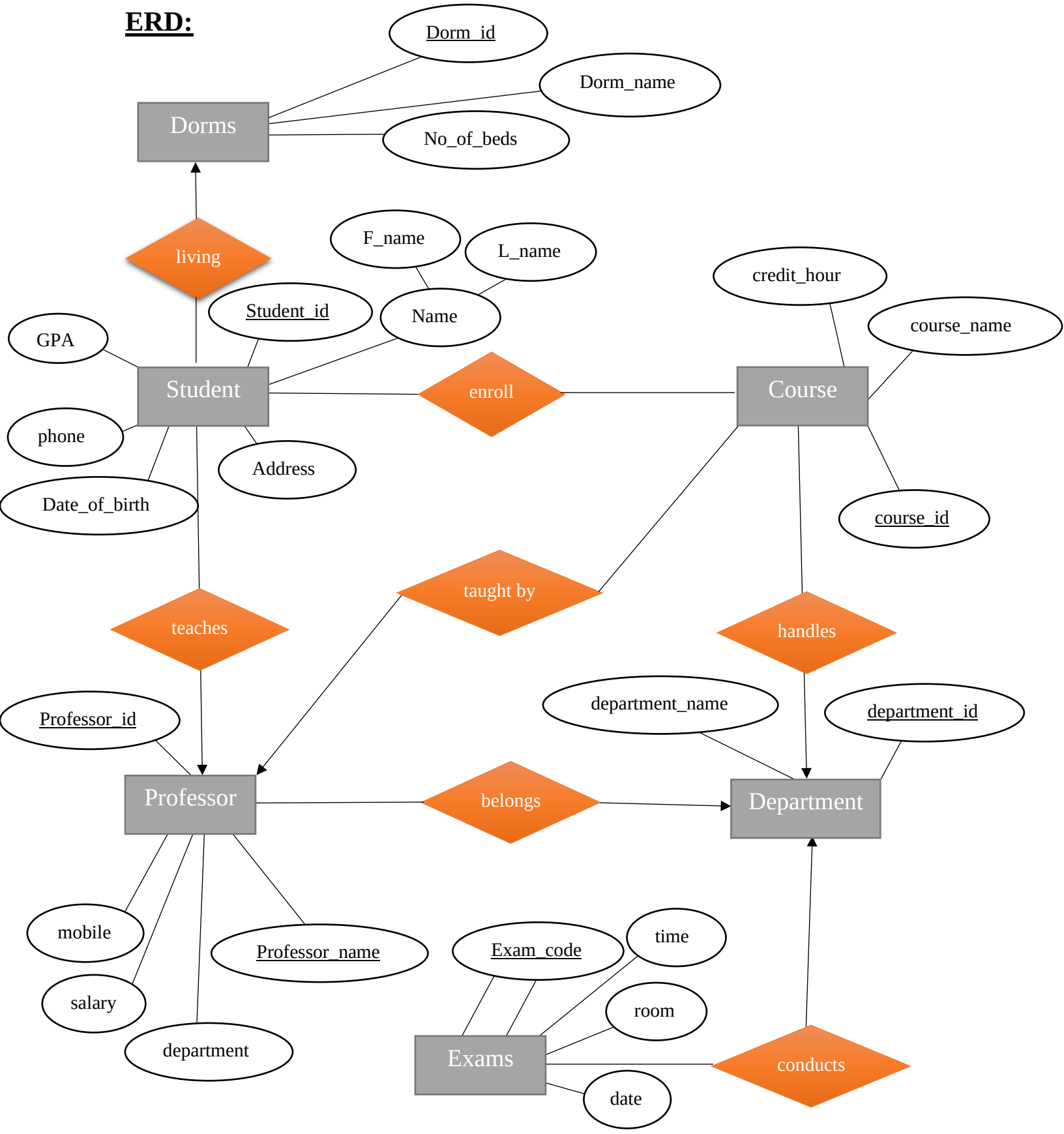
Word Problem:

- Students are recognized with a unique ID, and their name (First name, Last name), phone number, address, date of birth, GPA.
- Students can enroll for any number of courses, each course has a unique ID, name, credit hours.
- Department handles different number of courses, each department has a unique ID, name.
- Professor teaches any number of students, each professor is recognized with unique ID, name, department, salary, phone.
- Courses are taught by professor.
- Professors belongs to department.
- Department conducts exams. Each exam is recognized by unique code, room, date, time.
- Students live in dorms. Dorms are identified with ID, name, number of beds.

ERD:


Dorm_id
Dorm_name
Dorms
No_of_beds
living
F_name
L_name
credit_hour
Student_id
Name
course_name
GPA
Student
enroll
Course
phone
Address
Date_of_birth
course_id
taught by
teaches
handles
department_name
department_id
Professor_id
Professor
belongs
Department
mobile
Professor_name
Exam_code
time
salary
room
department
Exams
conducts
date

Schema:

Student (Student_id, GPA, F_name, L_name, Phone, Address, Date_of_birth, Dorm_id, Professor_id)

Enroll (Student_id, Course_id)

Course (Course_id, Course_name, Credit_hour, Department_id, Professor_id)

Dorm (Dorm_id, Dorm_name, no_of_beds)

Professor (Professor_id, Professor_name, Department, Salary, mobile, Department_id)

Department (Department_id, Department_name)

Exams (Exam_code, Room, Date, Time, Department_id)

Ps: the blue font is the foreign key between the entities

SQL:

Will write everything in steps

1. Create Database:
   CREATE DATABASE College;

2. Creating Dorm Table:
   Code:
   CREATE TABLE Dorm (dorm_id int PRIMARY KEY, dorm_name varchar(50), no_of_beds varchar(50));

   Insert values into the dorm table

   INSERT INTO Dorm(dorm_id,dorm_name,no_of_beds) VALUES(111,'A',10),(112,'B',5),(113,'C',20),(114,'D',15),(115,'A',30),(116,'E',25),(117,'F',8)

   Output:

dorm_id	dorm_name	no_of_beds
111	A	10
112	B	5
113	C	20
114	D	15
115	A	30
116	E	25
117	F	8

3. Creating Department Table:
   Code:
   CREATE TABLE Department (department_id int PRIMARY KEY, department_name varchar(50));

   Insert values into the department table

   INSERT INTO department(department_id,department_name)VALUES(1111,'AI'),(112,'Business'),(1113,'Cyber Security'),(1114,'Media'),(1115,'Health care'),(1116,'Accounting'),(1117,'General')

Output:

department_id	department_name
112	Business
1111	AI
1113	Cyber Security
1114	Media
1115	Health care
1116	Accounting
1117	General

4. Creating Professor Table:

Code:

```
CREATE TABLE Professor (professor_id int PRIMARY KEY, professor_name varchar(50), department varchar(50), salary int, mobile varchar(12), department_id int, FOREIGN KEY(department_id) REFERENCES department(department_id));
```

To insert data in professor table it will be a little bit different because it has a foreign key from the department table, so we will do the following for each professor will add a new one and select the department_id from the department table

```
INSERT INTO
professor(professor_id,professor_name,department,salary,mobile,department_id)
SELECT 100,'Mahmoud','business',2000,012356795185,department_id
FROM department
WHERE department_id = 112
LIMIT 1
```

Will repeat the following code for each row with different data

Output:

professor_id	professor_name	department	salary	mobile	department_id
100	Mahmoud	business	2000	12356795185	112
200	Reem	AI	2500	52356795785	1111
300	Eslam	Cyber Security	4000	12698795115	1113
400	Ghada	Media	5000	12356346985	1114
500	Mohamed	Health Care	3500	562256795185	1115
600	Tamer	Accounting	4000	598525679518	1116
700	Donia	General	6000	562256796548	1117

5. Creating Exams Table:

Code:

```
CREATE TABLE Exams (exam_code int PRIMARY KEY, room varchar(20),date
date, time time, department_id int, FOREIGN KEY(department_id) REFERENCES
department(department_id));
```

To insert data in Exams table it will be a little bit different because it has a foreign key from the department table, so we will do the following for each exam will add a new one and select the department_id from the department table

```
INSERT INTO exams(exam_code,room,date,time,department_id)
SELECT 22400567,'room 404','2023-5-28','12:00',department_id
FROM department
WHERE department_id = 112
LIMIT 1
```

Will repeat the following code for each row with different data

Output:

exam_code	room	date	time	department_id
2257802	room 420	2023-06-17	08:00:00	1113
22400202	room 404	2023-06-13	08:00:00	1117
22400203	lab 406	2023-06-19	09:00:00	1115
22400204	room 404	2023-06-14	09:00:00	1116
22400307	room 425	2023-05-31	09:00:00	1111
22400567	room 404	2023-05-28	12:00:00	112
22403202	lab 402	2023-06-22	12:00:00	1114

6. Creating Student Table:

Code:

```
CREATE TABLE Student (Student_id int PRIMARY KEY, First_name
varchar(20), Last_name varchar(20), phone VARCHAR(12), address char(50), GPA
FLOAT(24), date_of_birth Date,dorm_id int, FOREIGN KEY(dorm_id)
REFERENCES dorm(dorm_id),professor_id int, FOREIGN KEY(professor_id)
REFERENCES professor(professor_id));
```

While searching I found that to insert records into tables with multiple foreign keys, we should first create corresponding records in the tables that are referenced by foreign keys in the original tables.
In our case which is the Student table to insert records into the Student table, we must first create corresponding records in the Dorm and Professor tables. It is because the Student table contains foreign keys referencing
the Dorm and Professor tables.
Since the Dorm and Professor tables now have records with specific values, you can insert records into the Student table with corresponding foreign key values.
If you inserted a value that's not present in either the dorm nor the professor tables it will give an error.

```
INSERT INTO
Student(Student_id,First_name,Last_name,phone,address,GPA,date_of_birth,dorm_
id,professor_id) VALUES(1,'Malak','Aref',01234,'sporting',3.7,'2003-5-
30',111,100),(2,'Marwan','Aref',56865,'smouha',2.99,'1998-11-
8',112,200),(3,'Merna','Ehab',523506,'kafr abdo',3.1,'1995-10-
22',113,300),(4,'Lara','Alaa',70563,'tagamoa',2.5,'2002-4-
28',114,400),(5,'Abdulrahman','ELMadkhoum',45862,'sidi gaber',3.9,'1995-11-
30',115,500),(6,'Ahmed','ELMadkhoum',32865,'canada',3.8,'1995-1-
24',116,600),(7,'Yara','Ehab',23586,'tagamoa',3.95,'1994-3-10',117,700)
```

Output:

Student_id	First_name	Last_name	phone	address	GPA	date_of_birth	dorm_id	professor_id
1	Malak	Aref	1234	sporting	3.7	2003-05-30	111	100
2	Marwan	Aref	56865	smouha	2.99	1998-11-08	112	200
3	Merna	Ehab	523506	kafr abdo	3.1	1995-10-22	113	300
4	Lara	Alaa	70563	tagamoa	2.5	2002-04-28	114	400
5	Abdulrahman	ELMadkhoum	45862	sidi gaber	3.9	1995-11-30	115	500
6	Ahmed	ELMadkhoum	32865	canada	3.8	1995-01-24	116	600
7	Yara	Ehab	23586	tagamoa	3.95	1994-03-10	117	700

7. Creating Course Table:

CREATE TABLE Course (course_id int PRIMARY KEY, course_name varchar(50),credit_hour int, department_id int, FOREIGN KEY(department_id) REFERENCES department(department_id),professor_id int, FOREIGN KEY(professor_id) REFERENCES professor(professor_id));

While searching I found that to insert records into tables with multiple foreign keys, we should first create corresponding records in the tables that are referenced by foreign keys in the original tables.
In our case which is the Course table to insert records into the Course table, we must first create corresponding records in the Department and Professor tables. It is because the Course table contains foreign keys referencing
the Department and Professor tables.
Since the Department and Professor tables now have records with specific values, you can insert records into the Course table with corresponding foreign key values. If you inserted a value that's not present in either the Department nor the professor tables it will give an error.

INSERT INTO course(course_id, course_name,credit_hour, department_id,professor_id) VALUES (7894,'Management',2,112,100),(4561,'Database',3,1111,200),(5612,'Neural Networks',3,1113,300),(6123,'Problem Solving',3,1114,400),(1230,'Operating Systems',3,1115,500),(2307,'Operations Research',3,1116,600),(3078,'Human Rights',1,1117,700)

Output:

course_id	course_name	credit_hour	department_id	professor_id
1230	Operating Systems	3	1115	500
2307	Operations Research	3	1116	600
3078	Human Rights	1	1117	700
4561	Database	3	1111	200
5612	Neural Networks	3	1113	300
6123	Problem Solving	3	1114	400
7894	Management	2	112	100

8. Creating Enroll Table:

CREATE TABLE Enroll (student_id int, FOREIGN KEY(student_id) REFERENCES student(student_id),course_id int, FOREIGN KEY(course_id) REFERENCES course(course_id));

Insert values into the dorm table but you should make sure that the values you will insert is present in student and course tables.

INSERT INTO enroll(student_id, course_id) VALUES (1,1230),(2,2307),(3,3078),(4,4561),(5,5612),(6,6123),(7,7894)

Output:

student_id	course_id
1	1230
2	2307
3	3078
4	4561
5	5612
6	6123
7	7894