EC Database System

Gibran Roye, Muntabir Choudhury, Jared Fellenbaum

Project Ideas

- Gathered data and information about school record and registration system

- Analyzed the data and figured out possible entities we need to construct our database

- We figured 10 entities for EC Database System: School, Department, Professor, Student, Semester, Class, Course, Enroll, Room and Building.

Goals

- Created project narrative based on the information we had for EC Database System and possible queries based on narrative

- Project specification included: Relationships, Relationship participation, ERD, and 3rd Normalization Form

- Finally, created tables and inserted values into MySQL workbench and checked queries through MySQL client server.

Team Role and Responsibility

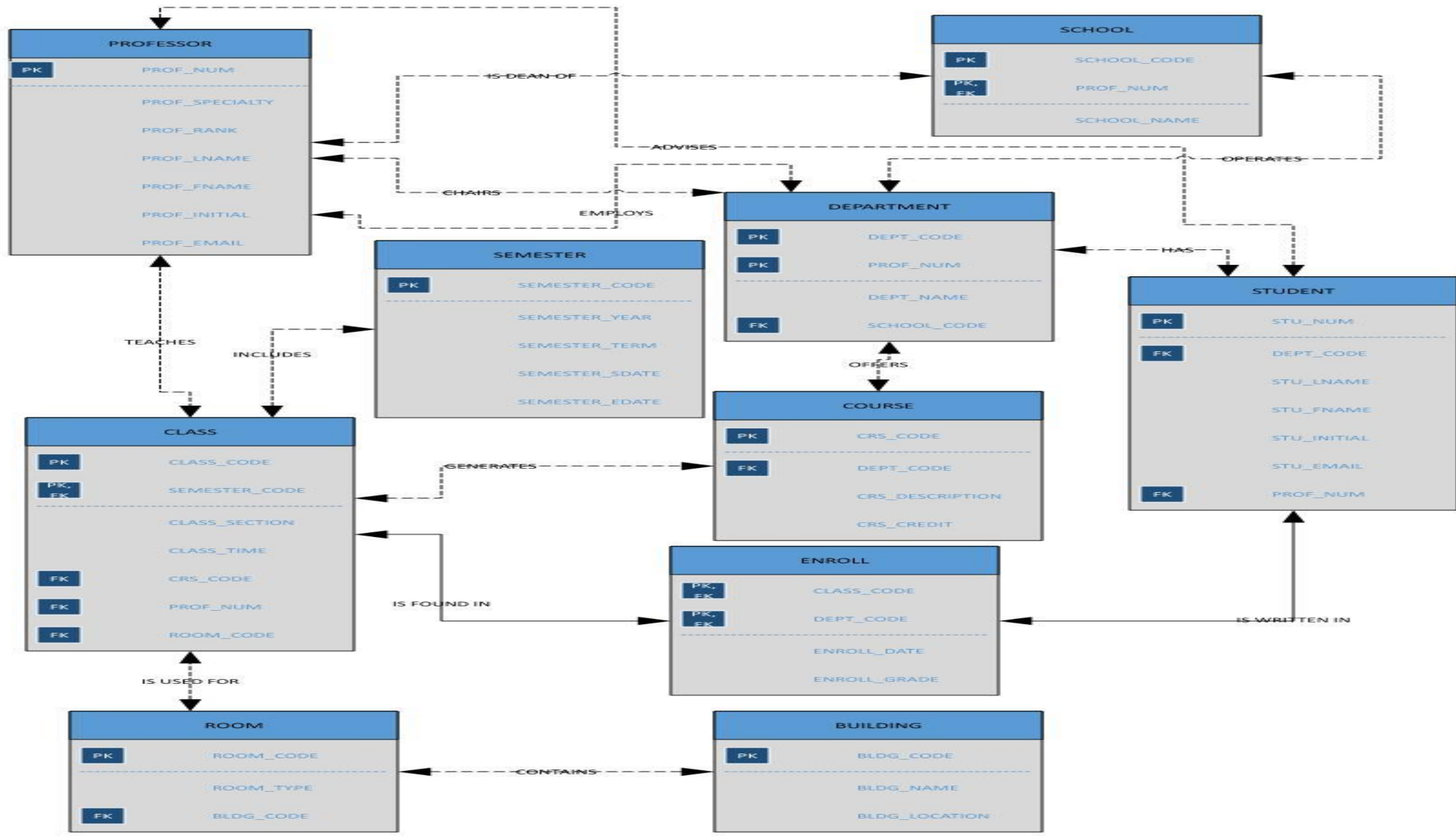| Name	Role	Responsibility
Tasin	Team Leader	Worked on project narrative, relationships, 3rd normal form and kept group in track to make sure to meet the deadlines
Jared	Construction of Database	Worked on business rules, ERD and constructed final database in MySQL workbench that we all worked on
Gibran	Queries and SQL check	Worked on queries based on project narrative and made sure to check it into MySQL client server

Relationships and Business rules

ENTITY	RELATIONSHIP	CONNECTIVITY	ENTITY	RELATIONSHIP STRENGTH
			DEPARTMENT	WEAK
SCHOOL	operates	1:M		
			STUDENT	WEAK
DEPARTMENT	has	1:M		
			PROFESSOR	WEAK
DEPRTMENT	employs	1:M		
			COURSE	WEAK
DEPARTMENT	offers	1:M		
COURSE	generates	1:M	CLASS	WEAK
SEMESTER	includes	1:M	CLASS	WEAK
			SCHOOL	WEAK
PROFESSOR	in dean of	1:1		
			CLASS	WEAK
PROFESSOR	teaches	1:M		
			STUDENT	WEAK
PROFESSOR	advises	1:M		
STUDENT	enrolls in	M:N	CLASS	STRONG
BUILDING	contains	1:M	ROOM	WEAK
ROOM	is used for	1:M	CLASS	WEAK

3ʳᵈ Normal Form

- **Professor** (*PROF_NUM, PROF_SPECIALITY, PROF_RANK, PROF_LNAME, PROF_FNAME, PROF_INITIAL, PROF_EMAIL, DEPT_CODE*);

- **SCHOOL** *(SCHOOL_CODE, SCHOOL_NAME, PROF_NUM);*

- **DEPARTMENT** (*DEPT_CODE, DEPT_NAME, PROF_NUM, SCHOOL_CODE);*

- **SEMESTER** (*SEMESTER_CODE, SEMESTER_YEAR, SEMESTER_TERM, SEMESTER_SDATE, SEMESTER_LDATE*);

- **COURSE** *(CRS_CODE, CRS_TITLE, CRS_DESCRIPTION, CRS_CREDIT, DEPT_CODE);*

3rd Normal Form (continued)

- **STUDENT** *(STU_NUM, STU_LNAME, STU_FNAME, STU_INITIAL, STU_EMAIL, DEPT_CODE, PROF_NUM);*

- **CLASS** *(CLASS_CODE, CLASS_SECTION, CLASS_TIME, CRS_CODE, PROF_NUM, ROOM_CODE, SEMESTER_CODE);*

- **ENROLL** *(CLASS_CODE, STU_NUM, ENROLL_DATE, ENROLL_GRADE);*

- **BUILDING** *(BLDG_CODE, BLDG_NAME, BLDG_LOCATION);*

- **ROOM** *(ROOM_CODE, ROOM_TYPE, BLDG_CODE);*

Queries and SQL Check

The number of students who have gone to professor for advising.

This query is important because we will be able to know that how many students actually have done advising to put off holds from their account.

```
select stu_num as student
from student
where prof_num is not null;
```

Student entity

- Student table

```
+----------+-----------+-----------+-----------+-------------+-------------------+----------+
| STU_NUM  | DEPT_CODE | STU_LNAME | STU_FNAME | STU_INITIAL | STU_EMAIL         | PROF_NUM |
+----------+-----------+-----------+-----------+-------------+-------------------+----------+
|    10010 | BA        | Ramas     | Alfred    | A           | aramas@ec.edu     |     3001 |
|    10011 | MA        | Dunne     | Leona     | K           | ldunne@ec.edu     |     1001 |
|    10012 | SC        | Smith     | Kathy     | W           | ksmith@ec.edu     |     2001 |
|    10013 | BA        | Olowski   | Paul      | F           | polowski@ec.edu   |     3002 |
|    10014 | MA        | Orlando   | Myron     |             | morlando@ec.edu   |     1002 |
|    10015 | SC        | O'Brian   | Amy       | B           | aobrian@ec.edu    |     2002 |
|    10016 | BA        | Brown     | James     | G           | jbrown@ec.edu     |     3003 |
|    10017 | MA        | Williams  | George    |             | gwilliams@ec.edu  |     1003 |
|    10018 | SC        | Farriss   | Anne      | G           | afarris@ec.edu    |     2003 |
```

- Student description

```
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| STU_NUM     | int(11)     | NO   | PRI | NULL    |       |
| DEPT_CODE   | varchar(5)  | NO   | MUL | NULL    |       |
| STU_LNAME   | varchar(25) | YES  |     | NULL    |       |
| STU_FNAME   | varchar(25) | YES  |     | NULL    |       |
| STU_INITIAL | varchar(1)  | YES  |     | NULL    |       |
| STU_EMAIL   | varchar(40) | YES  |     | NULL    |       |
| PROF_NUM    | int(11)     | YES  | MUL | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
```

Queries and SQL

Display how many professors are in each department and show how many specialties are then in each department.

By doing this we will know if a department is overpopulated and we will be able to split according to the number of specialties inside the department.

```sql
select department.dept_code as department,count(department.prof_num) as professors, count(professor.prof_specialty) as specialities
from department, professor
where professor.prof_num=department.prof_num
group by dept_code;
```

department	professors	specialities
BA	4	4
MA	4	4
SC	4	4

Department and professor entities

- **Department**

DEPT_CODE	DEPT_NAME	SCHOOL_CODE	PROF_NUM
BA	Business	S-BA	3001
BA	Business	S-BA	3002
BA	Business	S-BA	3003
BA	Business	S-BA	3004
MA	Mathematics	N-MS	1001
MA	Mathematics	N-MS	1002
MA	Mathematics	N-MS	1003
MA	Mathematics	N-MS	1004
SC	Sciences	N-MS	2001
SC	Sciences	N-MS	2002
SC	Sciences	N-MS	2003
SC	Sciences	N-MS	2004

- **Professor**

PROF_NUM	PROF_SPECIALTY	PROF_RANK	PROF_LNAME	PROF_FNAME	PROF_INITIAL	PROF_EMAIL
1001	Calculus	Senior	Craig	Donnie	L	CD1001@ec.edu
1002	Algebra	Adjunct	Thompson	Stella	M	ST1001@ec.edu
1003	Statistics	Adjunct	Mitchell	Sam	B	SM1001@ec.edu
1004	Differential Equation	Junior	Figueroa	Liz	E	LF1001@ec.edu
2001	Computer Science	Senior	Ramirez	Kay	T	KR2001@ec.edu
2002	Computer Science	Adjunct	Bradley	Dianna	N	DB2002@ec.edu
2003	Information Systems	Adjunct	Manning	Dominic	U	DM2003@ec.edu
2004	Information Systems	Junior	Sandoval	Emma	S	ES2004@ec.edu
3001	Accounting	Senior	Floyd	Muriel	G	MF3001@ec.edu
3002	Economics	Adjunct	Burton	Hugh	H	HB3002@ec.edu
3003	Business Administration	Adjunct	Miles	Robert	V	RM3003@ec.edu
3004	International Business	Junior	Andrews	Guy	T	GA3004@ec.edu

Queries and SQL

Display the number of classes offer in each semester.

This report will allow us to know how many classes are going to offer in each semester.

```sql
select semester_code as semester, count(class_code) as classes
from class
group by semester_code;
```

```
+-------------+---------+
| semester    | classes |
+-------------+---------+
| fall_14     |      40 |
| fall_15     |      40 |
| fall_16     |      40 |
| spring_15   |      38 |
| spring_16   |      40 |
| spring_17   |      40 |
+-------------+---------+
```

Class entity

- Class table


```
+------------+---------------+------------+----------+----------+-----------+---------------+
| CLASS_CODE | CLASS_SECTION | CLASS_TIME | CRS_CODE | PROF_NUM | ROOM_CODE | SEMESTER_CODE |
+------------+---------------+------------+----------+----------+-----------+---------------+
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 303       | fall_14       |
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 303       | fall_15       |
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 303       | fall_16       |
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 301       | spring_15     |
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 301       | spring_16     |
| AC-101     | A             | 07:00:00   | BUSINESS |     3001 | 301       | spring_17     |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 303       | fall_14       |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 303       | fall_15       |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 303       | fall_16       |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 301       | spring_15     |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 301       | spring_16     |
| AC-201     | A             | 08:00:00   | BUSINESS |     3001 | 301       | spring_17     |
```

- Describe class


```
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| CLASS_CODE    | varchar(10) | NO   | PRI | NULL    |       |
| CLASS_SECTION | varchar(5)  | YES  |     | NULL    |       |
| CLASS_TIME    | time        | YES  |     | NULL    |       |
| CRS_CODE      | varchar(10) | YES  | MUL | NULL    |       |
| PROF_NUM      | int(11)     | YES  | MUL | NULL    |       |
| ROOM_CODE     | varchar(10) | YES  | MUL | NULL    |       |
| SEMESTER_CODE | varchar(10) | NO   | PRI | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
```

Thank You