9/26/2023

CS 6342 DATABASE MANAGEMENT

Fall 2023 Semester

Assignment 2

Funding Opportunities

TEAM THREE: DATA MANAGERS

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Evans Etrue Howard

Maria Ramirez Vega

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1. SCOPE

You have been hired to create a system at The University of Texas at El Paso. The university is interested in identifying specific solicitations from agencies, which faculty applied to what and whether they were awarded the grant or not and the departments of the faculty. The system will keep record of the agencies offering the solicitations. Each agency must hold a name, type of agency (government agency, private foundations, corporations, and non-profit organization), contact information and available amount for funding (budget). Each solicitation published by the agencies has a deadline, unique number, description, submission dates, list of requirements (such as, proposal, budget, Individual Development Plan- IDP) and additional information/documents (such as the biography and CV of the faculty, facilities at the university, letter of support, letter of interest, past projects of the faculty) **and keywords** to match with faculty interest. Each faculty profile will also be stored with a name, email address (unique), department, research interests (key words), projects they have had in the past (description of the kind of funding they had in the past (if any)) and the students involved on those projects. Projects will have a unique number, description, the people involved (principal investigator, PI, staff, students), start date and end date. If a project is from multiple universities the system will keep track of which universities, which people from those universities were involved and their roles. Each faculty can belong to more than one department which can be identified by a unique ID, name, chair of the department chair email and a contact information. Also, each department must belong to a college with a unique ID, name, dean and the contact information.

The system will extract key words from the solicitation and match them to the researcher interest. Also, the system will send out reminders to the faculty email addresses at several time points before the deadline. The university administration wants to keep track of the faculty who are in the application process including the principal investigator name, names of the staff, preliminary proposal, whether they have a current grant and the agency (when applicable). The client is interested in knowing which colleges and departments are involved in each solicitation application process and the research interests of the faculty members in these departments and colleges. The university wants to know the past projects of each faculty member and the departments they were affiliated with.

NOTE: The scope was created and refined by all members of the team.

Which colleges and departments are involved in each grant application.

The research interests of the faculty members in each college and department.

The past projects of each faculty member and the departments they were affiliated with.

The start and end dates of all projects, and the departments they are associated with.

2. Requirements and Assumptions

Kanishk Yadav – Design Lead, Evans Etrue Howard – SQL Lead, Maria Ramirez Vega – Interface and Results Lead

I. Requirements

Database system section about **AGENCY** entity assigned to Kanishk Yadav – Design Lead:

R1. As a key point of reference, every agency needs to have a distinctive name that sets it apart from the rest.

R2. The solicitation must identify the type of agency and the name of the organization presenting the specified request.

R3. When an agency posts a solicitation, it is important to disclose the budget because it allows academics to consider the solicitation, they are applying to considering the project's budgetary requirements.

R4. To facilitate communication with the faculty, the agency's phone number, fax number, and email address should be provided.

R5. Upon publication, an agency will be permitted to publish several solicitations.

R6. The agency must have the ID number for the solicitation that the faculty member applied for on hand.

R7. An agency may possess more than one type of agency.

Database system section about **SOLICITATION** entity assigned to Evans Etrue Howard – SQL Lead:

R8. The database system shall keep track of the description, and submission dates of each solicitation.

R9. The database shall enforce solicitations to have a unique number.

R10. The database system shall enforce a strict deadline on solicitations.

R11. The system shall keep track of each solicitation’s requirements and estimated budget.

R12. The database system shall enforce that only one team can apply from a university.

R13. The database system shall enforce that a Principal Investigator cannot participate in more than one proposal for a solicitation.

R14. The database system shall enforce that the office of Research and Sponsored Projects (at the university) shall submit the letter of interest and proposal for the solicitation.

R15. The system shall match solicitations to faculty based on keywords.

Database system section about **PROJECT** entity assigned to Evans Etrue Howard – SQL Lead:

R16. The database system shall enforce that Projects have a unique number.

R17. The database system shall request for a preliminary proposal for some solicitations, which will be used as an initial filter for a project.

R18. The database system shall keep track of the description of the projects.

R19. The database system shall keep track of the roles of the people involved in a project.

R20. The system shall keep track of project's start date and end date.

R21. Each project will have an evaluation plan.

R22. Multiple projects can be worked on by a faculty at the same time.

R223. A project shall be worked on by multiple faculties.

Database system section about **FACULTY** entity assigned to Maria Ramirez Vega – Interface and Results Lead:

R24. The system shall keep track of the profile of the faculty including name, department.

R25. The system shall enforce faculties to have a unique email address.

R26. The system shall keep track of the faculty's research interest. This research interest must be expressed with key words.

R27. The system shall keep track of the names, category and major of the students.

R28. The system must describe the type of external funding or grants awarded, amount, and a fully description of the duties they had in the past or currently ongoing when applicable.

R29. The system shall implement authentication mechanisms that ensure that only authorized users can access or modify the database.

R30. The system's reliability, backup, and recovery mechanisms shall be included to prevent data loss in the event of a system failure.

II. Assumptions

Database system section about **AGENCY** entity assigned to Kanishk Yadav – Design Lead:

A1. To prevent duplication or confusion across agencies, each agency placed into the system is given a unique name.

A2. The categories of agencies (public, private, etc.) are set in stone and won't be altered often. A system upgrade would be necessary if a new kind was to be added.

A3. There is a single main point of contact for each agency. The primary or most used contact point that an agency has, if any, is stored in the system.

A4. The agency's budget is the total amount that can be allocated to all solicitations. It is anticipated that no solicitation will cost more than this amount in total.

A5. The system does not manage currency conversion; all budget amounts are expressed in the same currency.

A6. An agency may release more than one request; however, each solicitation is specifically associated with a single agency.

A7. Agencies may be active or inactive, but even in the latter case, their information is kept on file in the system for history and reference.

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Database system section about **SOLICITATION** entity assigned to Evans Etrue Howard – SQL Lead:

A8. The database system shall keep track of the students and other staff involved in a project and a solicitation.

A9. The amount awarded for the solicitation shall be less than what was requested.

A10. Researchers who pass the initial filter will be required to submit their final proposal.

A11. There is an internal competition to determine which team is the strongest (more qualified) to apply for a specific solicitation.

A12. Interested faculty shall receive a checklist of all the things the solicitation is asking for.

A13. Solicitation shall ask for individual development plan.

A14. The university can receive many solicitations per day.

Database system section about **PROJECTS** entity assigned to Evans Etrue Howard – SQL Lead:

A15. Projects shall have a project management plan.

A16. The system will track the status of the projects.

A17. For international collaborations, the appropriate rules and regulations must be adhered to.

A18. The system shall keep track of the number of people involved in the project.

A19. When a project is from multiple universities the system will keep track of which universities, which people from those universities were involved and their roles.

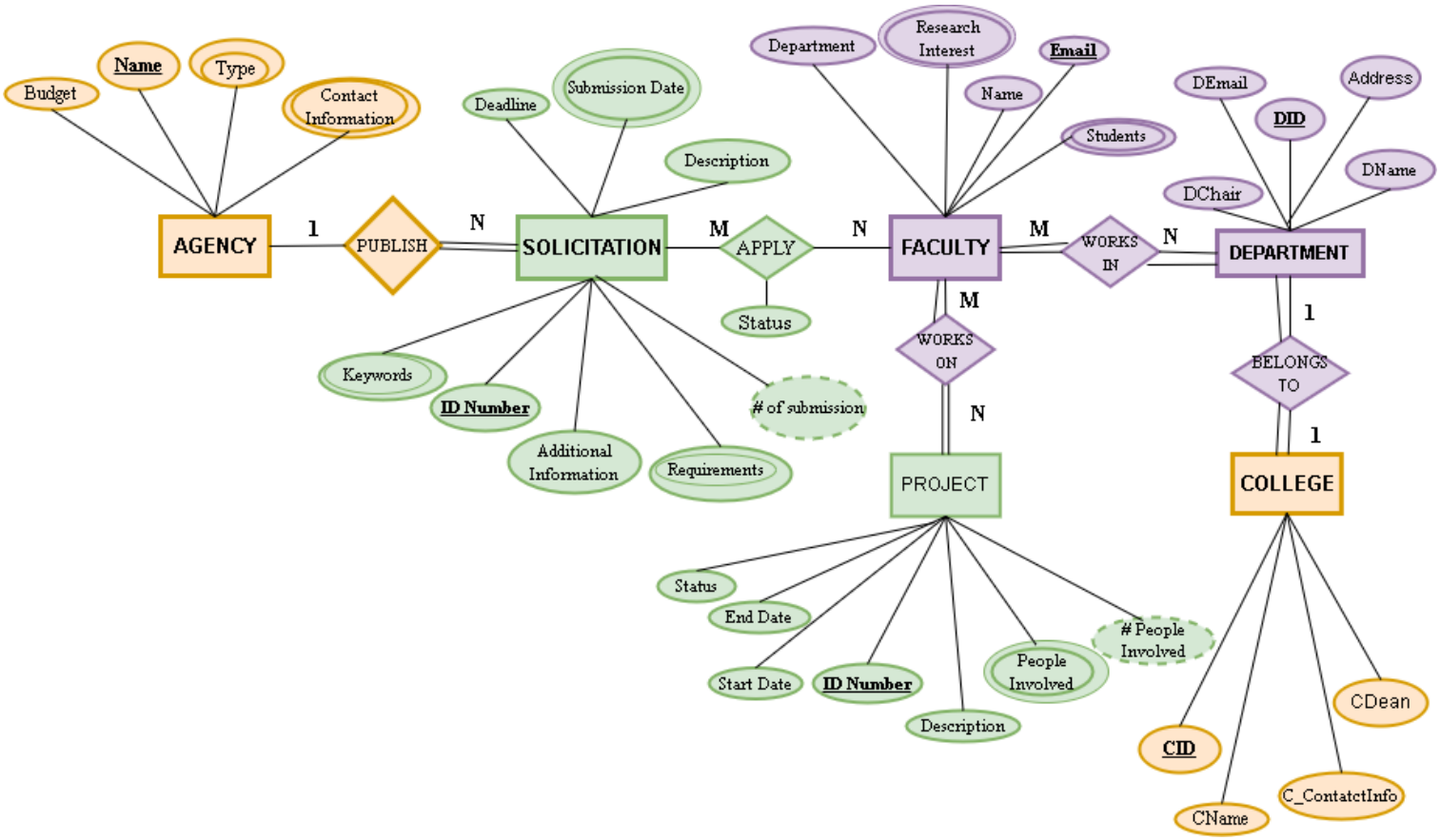
Database system section about **FACULTY** entity assigned to Maria Ramirez Vega – Interface and Results Lead:

A20. The system will account for a data dictionary that refers to the research interest key words, but it cannot create new activity types on demand.

A21. The system will consider only faculty members that are qualified to postulate for a solicitation.

A22. The system shall comply with applicable data privacy and security regulations, including GDPR and HIPAA, based on the nature of the data that is being collected and stored.

3. ENTITIY – RELATIONSHIP DIAGRAM

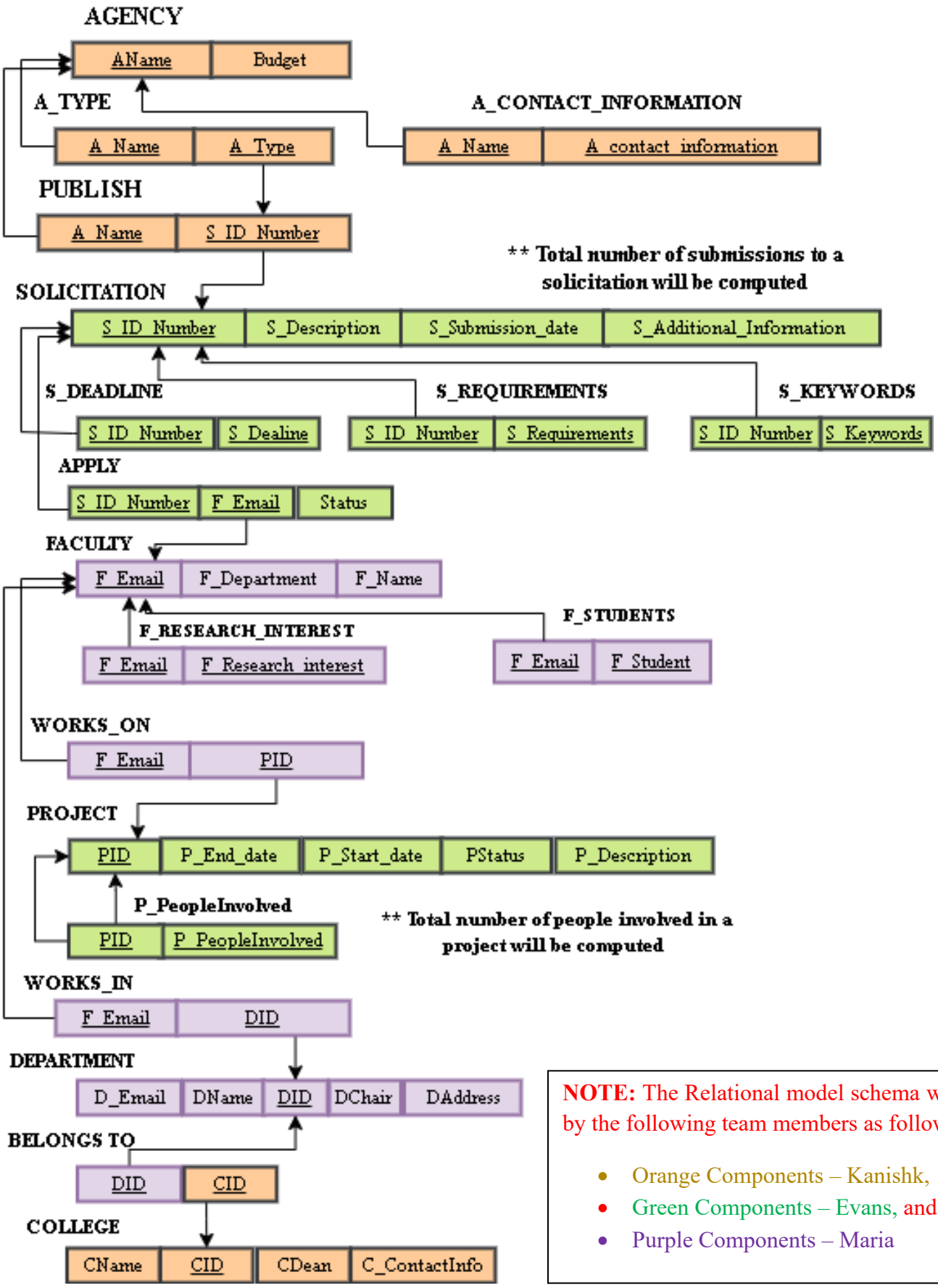


NOTE: The E/R Diagram components were designed by the following team members as follows:

- Orange Components – Kanishk,
- Green Components – Evans, and
- Purple Components – Maria

Each member of the team reviewed other person's component for consistency.

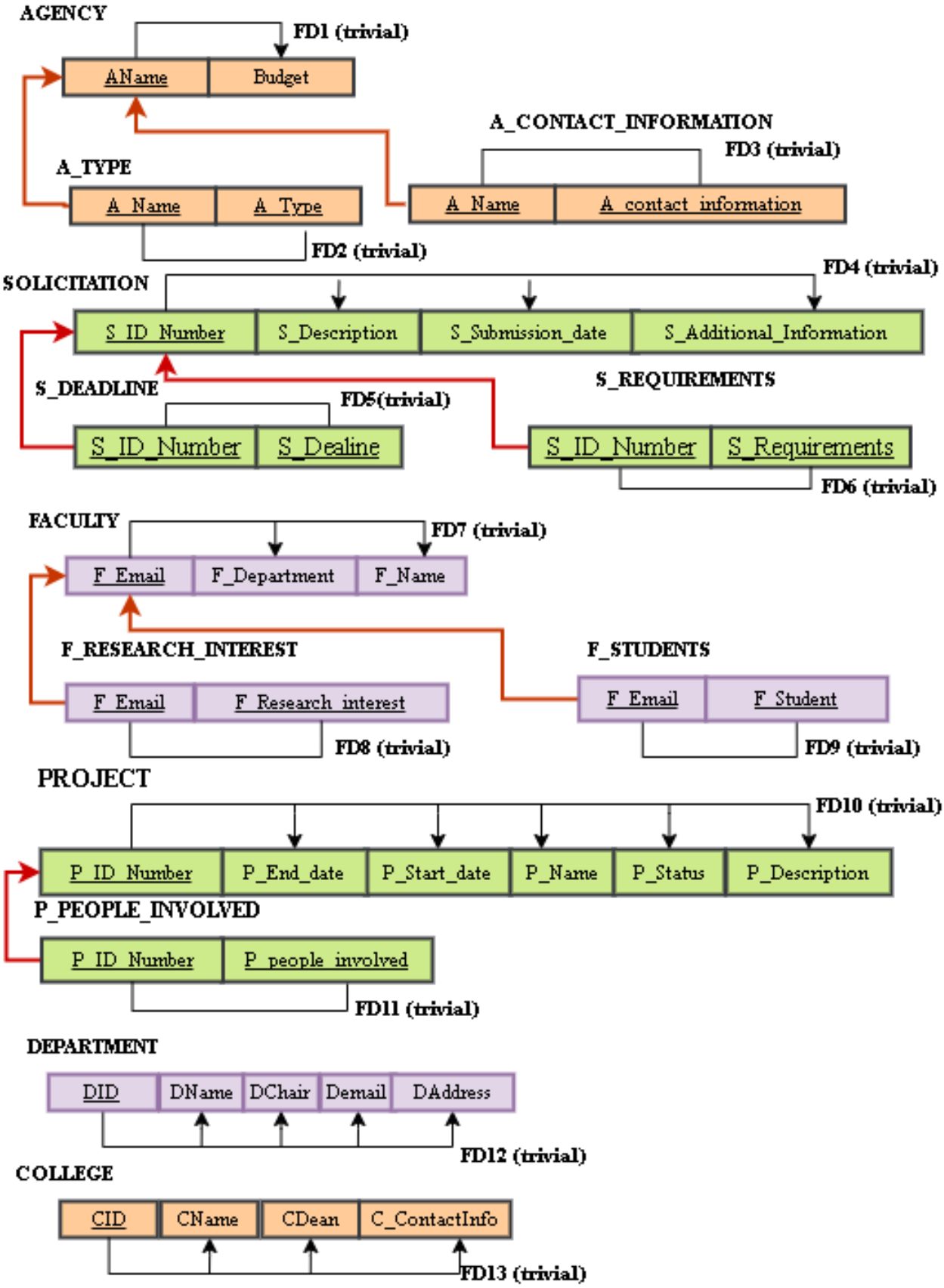
4. RELATIONAL MODEL



NOTE: The Relational model schema was designed by the following team members as follows:

- Orange Components – Kanishk,
- Green Components – Evans, and
- Purple Components – Maria

5. Normalized Schema and Functional Dependencies



The AGENCY, A_TYPE, A_CONTACT_INFORMATION, COLLEGE relations are all in 1NF because all their attributes are atomic.

The AGENCY, A_TYPE, A_CONTACT_INFORMATION, COLLEGE relations are all in 2NF because all the non-prime attributes are fully dependent on their corresponding primary keys.

The AGENCY, A_TYPE, A_CONTACT_INFORMATION, COLLEGE relations are all in 3NF because none of the non-prime attributes depends on another non-prime attribute.

The SOLICITATION, S_DEADLINE, S_REQUIREMENTS, PROJECT, P_PEOPLE_INVOLVED relations are all in 1NF because all their attributes are atomic.

The SOLICITATION, S_DEADLINE, S_REQUIREMENTS, PROJECT, P_PEOPLE_INVOLVED relations are all in 2NF because all the non-prime attributes are fully dependent on their corresponding primary keys.

The SOLICITATION, S_DEADLINE, S_REQUIREMENTS, PROJECT, P_PEOPLE_INVOLVED relations are all in 3NF because none of the non-prime attributes depends on another non-prime attribute.

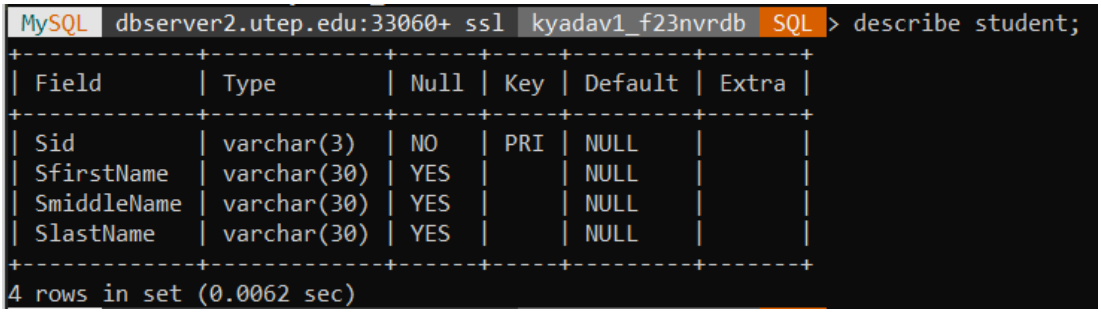
The FACULTY, F_RESEARCH_INTEREST, F_STUDENTS, DEPARTMENT relations are all in 1NF because all their attributes are atomic.

The FACULTY, F_RESEARCH_INTEREST, F_STUDENTS, DEPARTMENT relations are all in 2NF because all the non-prime attributes are fully dependent on their corresponding primary keys.

The FACULTY, F_RESEARCH_INTEREST, F_STUDENTS, DEPARTMENT relations are all in 3NF because none of the non-prime attributes depends on another non-prime attribute.

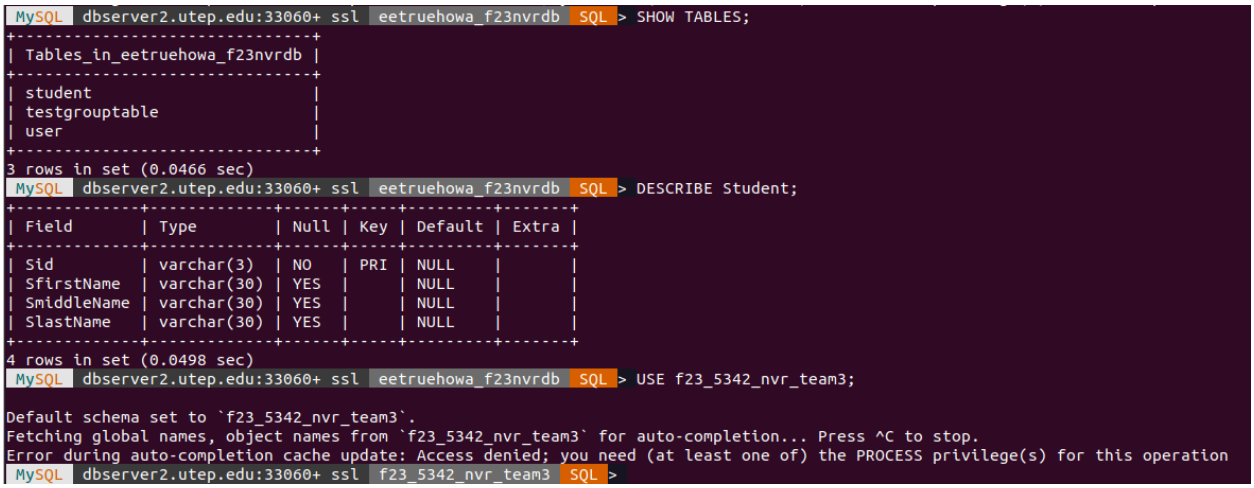
6. MySQL SERVER

- **Individual Test Table by Kanishk Yadav – Design Lead: -**



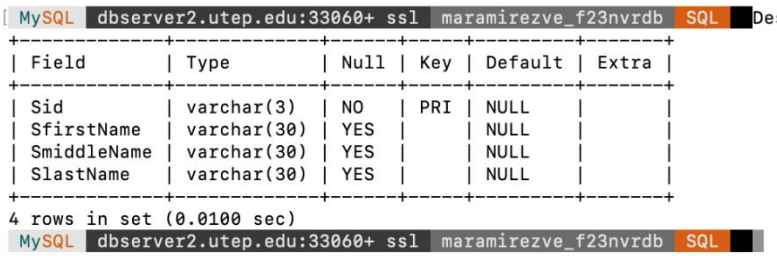
```
MySQL dbserver2.utep.edu:33060+ ssl kyadav1_f23nvrdb SQL > describe student;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Sid         | varchar(3)  | NO   | PRI | NULL    |       |
| SfirstName  | varchar(30) | YES  |     | NULL    |       |
| SmiddleName | varchar(30) | YES  |     | NULL    |       |
| SlastName   | varchar(30) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.0062 sec)
```

- **Individual Test Table by Evans Howard- SQL lead: -**



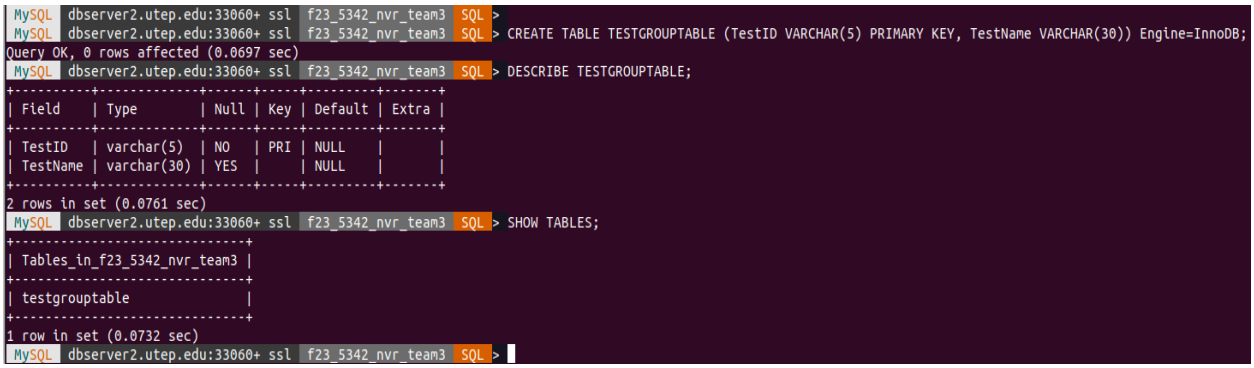
```
MySQL dbserver2.utep.edu:33060+ ssl eetruehowa_f23nvrdb SQL > SHOW TABLES;
+------------------------------+
| Tables_in_eetruehowa_f23nvrdb |
+------------------------------+
| student                      |
| testgrouptable               |
| user                         |
+------------------------------+
3 rows in set (0.0466 sec)
MySQL dbserver2.utep.edu:33060+ ssl eetruehowa_f23nvrdb SQL > DESCRIBE Student;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Sid         | varchar(3)  | NO   | PRI | NULL    |       |
| SfirstName  | varchar(30) | YES  |     | NULL    |       |
| SmiddleName | varchar(30) | YES  |     | NULL    |       |
| SlastName   | varchar(30) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.0498 sec)
MySQL dbserver2.utep.edu:33060+ ssl eetruehowa_f23nvrdb SQL > USE f23_5342_nvr_team3;

Default schema set to `f23_5342_nvr_team3`.
Fetching global names, object names from `f23_5342_nvr_team3` for auto-completion... Press ^C to stop.
Error during auto-completion cache update: Access denied; you need (at least one of) the PROCESS privilege(s) for this operation
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
```

- **Individual Test Table by Maria Ramirez- Interface and reports lead: -**



```
MySQL dbserver2.utep.edu:33060+ ssl maramirezve_f23nvrdb SQL Describe student;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Sid         | varchar(3)  | NO   | PRI | NULL    |       |
| SfirstName  | varchar(30) | YES  |     | NULL    |       |
| SmiddleName | varchar(30) | YES  |     | NULL    |       |
| SlastName   | varchar(30) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.0100 sec)
MySQL dbserver2.utep.edu:33060+ ssl maramirezve_f23nvrdb SQL
```

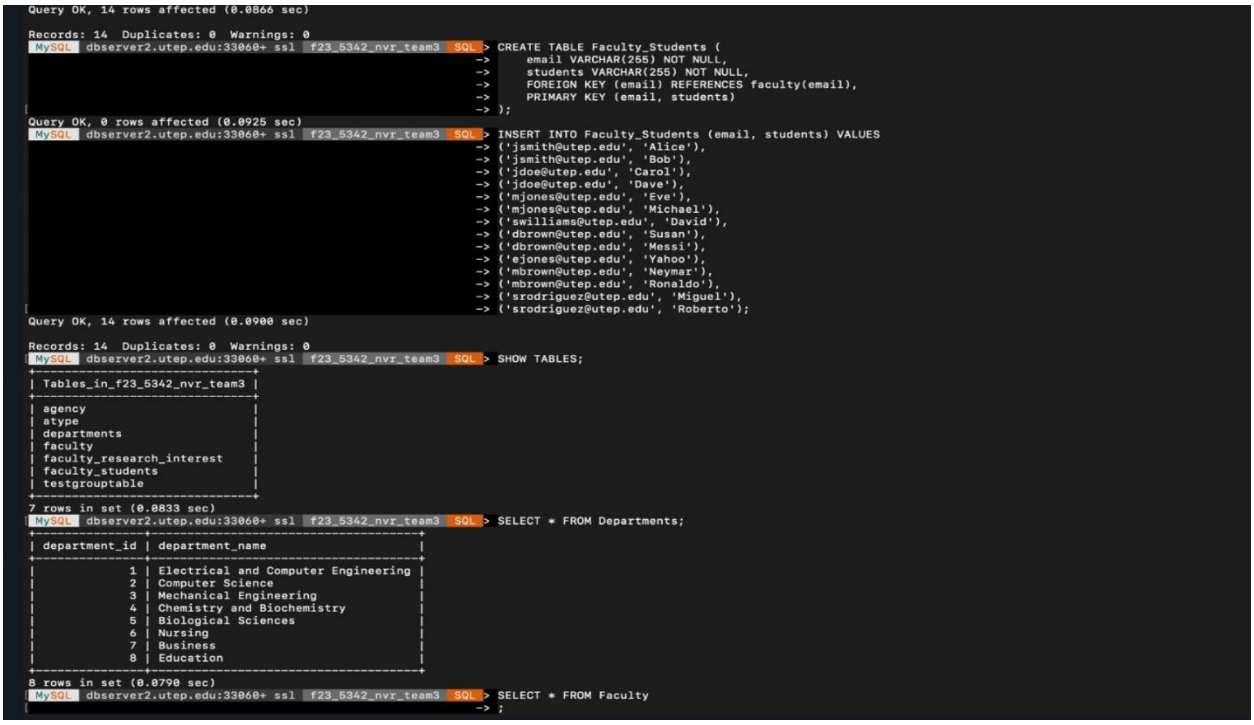
- **Test Group Table for Team 3: Data Managers**



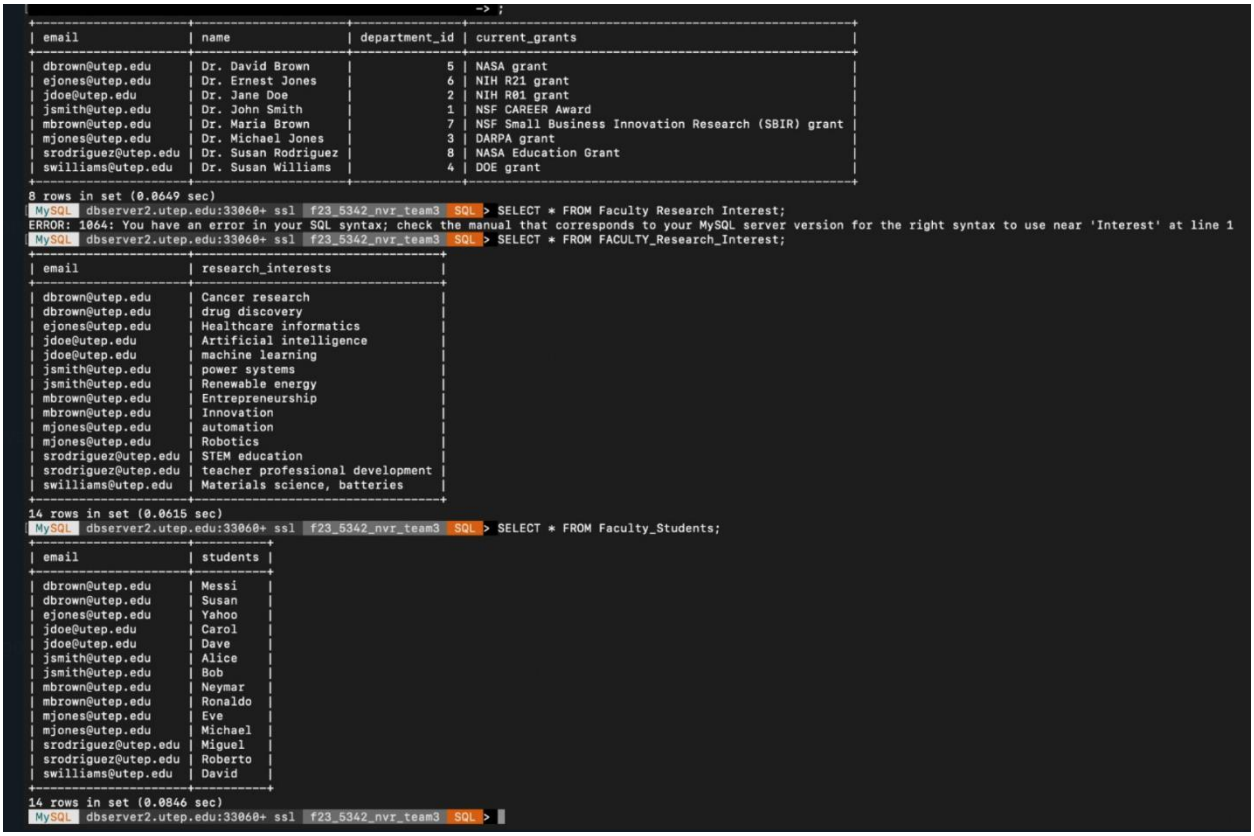
```
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > CREATE TABLE TESTGROUPTABLE (TestID VARCHAR(5) PRIMARY KEY, TestName VARCHAR(30)) Engine=InnoDB;
Query OK, 0 rows affected (0.0697 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > DESCRIBE TESTGROUPTABLE;
+----------+------------+------+-----+---------+-------+
| Field    | Type       | Null | Key | Default | Extra |
+----------+------------+------+-----+---------+-------+
| TestID   | varchar(5)  | NO   | PRI | NULL    |       |
| TestName | varchar(30) | YES  |     | NULL    |       |
+----------+------------+------+-----+---------+-------+
2 rows in set (0.0761 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SHOW TABLES;
+----------------------------+
| Tables_in_f23_5342_nvr_team3 |
+----------------------------+
| testgrouptable             |
+----------------------------+
1 row in set (0.0732 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
```

7. DATABASE SCHEMA

FACULTY TABLE by Maria



FAULTY _RESEARCH TABLE by Maria



AGENCY TABLE by Kanisk

```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT
                                                           ->     a.AName,
                                                           ->     a.AAddress,
                                                           ->     a.APhoneNumber,
                                                           ->     a.AEmail,
                                                           ->     a.ABudget,
                                                           ->     t.AType
                                                           -> FROM
                                                           ->     agency a
                                                           -> INNER JOIN
                                                           ->     Atype t
                                                           -> ON
                                                           ->     a.AName = t.AName;
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+------------+
| AName                                               | AAddress                                            | APhoneNumber   | AEmail                    | ABudget       | AType      |
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+------------+
| Alphabet Inc.                                       | 1600 Amphitheater Parkway Mountain View, CA 94043 USA | (650) 253-0000 | investor-relations@abc.XYZ | $17 billion   | Non-Profit |
| Alphabet Inc.                                       | 1600 Amphitheater Parkway Mountain View, CA 94043 USA | (650) 253-0000 | investor-relations@abc.XYZ | $17 billion   | Public     |
| Heartflow                                           | 31 E Evelyn Ave, Mountain View, CA 94041            | 1-877-478-3569 | investors@heartflow.com    | $11 billion   | Non-Profit |
| Heartflow                                           | 31 E Evelyn Ave, Mountain View, CA 94041            | 1-877-478-3569 | investors@heartflow.com    | $11 billion   | Pvt.       |
| National Aeronautics and Space Administration (NASA) | 300 E Street SW, Washington, DC 20546              | 1 (202) 358-0001 | nssc-contactcenter@nasa.gov | $23.3 billion | Govt.      |
| National Aeronautics and Space Administration (NASA) | 300 E Street SW, Washington, DC 20546              | 1 (202) 358-0001 | nssc-contactcenter@nasa.gov | $23.3 billion | Non-Profit |
| National Institutes of Health (NIH)                 | 9000 Rockville Pike, Bethesda, MD 20892             | 301-435-2920   | webmaster@cc.nih.gov       | $41.6 billion | Govt.      |
| National Institutes of Health (NIH)                 | 9000 Rockville Pike, Bethesda, MD 20892             | 301-435-2920   | webmaster@cc.nih.gov       | $41.6 billion | Non-Profit |
| National Science Foundation (NSF)                   | 241 5th Street NW, Washington, DC 20550             | 1-800-381-1532 | rgov@nsf.gov               | $8.8 billion  | Govt.      |
| National Science Foundation (NSF)                   | 241 5th Street NW, Washington, DC 20550             | 1-800-381-1532 | rgov@nsf.gov               | $8.8 billion  | Non-Profit |
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+------------+
```

AGENCY _CONTACT_INFO TABLE by Kanisk

```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > INSERT INTO Agency (AName, AAddress, APhoneNumber, AEmail, ABudget) VALUES
                                                           -> ('National Science Foundation (NSF)', '241 5th Street NW, Washington, DC 20550', '1-800-381-1532', 'rgov@nsf.gov', '$8.8 billion'),
                                                           -> ('National Institutes of Health (NIH)', '9000 Rockville Pike, Bethesda, MD 20892', '301-435-2920', 'webmaster@cc.nih.gov', '$41.6 billion'),
                                                           -> ('National Aeronautics and Space Administration (NASA)', '300 E Street SW, Washington, DC 20546', '1 (202) 358-0001', 'nssc-contactcenter@nasa.gov
', '$23.3 billion'),
                                                           -> ('Alphabet Inc.', '1600 Amphitheater Parkway Mountain View, CA 94043 USA', '(650) 253-0000', 'investor-relations@abc.XYZ', '$17 billion'),
                                                           -> ('Heartflow', '31 E Evelyn Ave, Mountain View, CA 94041', '1-877-478-3569', 'investors@heartflow.com', '$11 billion');
Query OK, 5 rows affected (0.0066 sec)

Records: 5  Duplicates: 0  Warnings: 0
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT * FROM Agency;
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+
| AName                                               | AAddress                                            | APhoneNumber   | AEmail                    | ABudget       |
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+
| Alphabet Inc.                                       | 1600 Amphitheater Parkway Mountain View, CA 94043 USA | (650) 253-0000 | investor-relations@abc.XYZ | $17 billion   |
| Heartflow                                           | 31 E Evelyn Ave, Mountain View, CA 94041            | 1-877-478-3569 | investors@heartflow.com    | $11 billion   |
| National Aeronautics and Space Administration (NASA) | 300 E Street SW, Washington, DC 20546              | 1 (202) 358-0001 | nssc-contactcenter@nasa.gov | $23.3 billion |
| National Institutes of Health (NIH)                 | 9000 Rockville Pike, Bethesda, MD 20892             | 301-435-2920   | webmaster@cc.nih.gov       | $41.6 billion |
| National Science Foundation (NSF)                   | 241 5th Street NW, Washington, DC 20550             | 1-800-381-1532 | rgov@nsf.gov               | $8.8 billion  |
+-----------------------------------------------------+-----------------------------------------------------+----------------+---------------------------+---------------+
5 rows in set (0.0051 sec)
```

SOLICITATION TABLE by EVANS

```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > DESCRIBE solicitation;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| SID            | varchar(255) | NO   | PRI | NULL    |       |
| AName          | varchar(255) | NO   | PRI | NULL    |       |
| email          | varchar(255) | NO   | PRI | NULL    |       |
| Deadline       | date        | YES  |     | NULL    |       |
| Description    | text        | YES  |     | NULL    |       |
| AdditionalInfo | text        | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
6 rows in set (0.0045 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT * from solicitation;
+------------+-----------------------------------+-----------------+------------+-----------------------------------------------------------------+-----------------------------+
| SID        | AName                             | email           | Deadline   | Description                                                     | AddItionalInfo              |
+------------+-----------------------------------+-----------------+------------+-----------------------------------------------------------------+-----------------------------+
| NIH-24-501 | National Institutes of Health (NIH) | jdoe@utep.edu   | 2024-03-31 | This solicitation is for research on new drugs for cancer treatment | facilities at the university |
| NSF-23-501 | National Science Foundation (NSF)   | jsmith@utep.edu | 2023-12-31 | This solicitation is for research on new types of solar cells       | Biography                   |
+------------+-----------------------------------+-----------------+------------+-----------------------------------------------------------------+-----------------------------+
2 rows in set (0.0240 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > select * from projects;
ERROR: 1146: Table 'f23_5342_nvr_team3.projects' doesn't exist
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > select * from project;
+-----+-------------------+-------------+-----------------------------------------------------------------+------------+------------+-----------------+-----------------------------------------------------------------
-----------------------------------------------------+
| PID | email             | DepartmentID | ProjectName                                                     | StartDate  | EndDate    | Status          | Description
                                                     |
+-----+-------------------+-------------+-----------------------------------------------------------------+------------+------------+-----------------+-----------------------------------------------------------------
-----------------------------------------------------+
|   1 | jsmith@utep.edu   |           1 | Development of a new type of solar cell                         | 2023-08-01 | 2025-12-31 | progress        | This project aims to develop a new type of solar cell
that is more efficient and less expensive.           |
|   2 | jdoe@utep.edu     |           2 | Development of a new drug for cancer treatment                  | 2023-09-01 | 2026-06-30 | Funded          | This project aims to develop a new drug for cancer tre
atment that is more effective and has fewer side effects. |
|   3 | mjones@utep.edu   |           3 | Development of a new algorithm for artificial intelligence      | 2023-10-01 | 2027-03-31 | Proposal submitted | This project aims to develop a new algorithm for artif
icial intelligence that is more efficient and accurate.   |
|   4 | swilliams@utep.edu |           4 | Development of a new type of material for batteries             | 2023-11-01 | 2028-09-30 | Not started     | This project aims to develop a new type of material fo
r batteries that is more energy-dense and durable.        |
|   5 | dbrown@utep.edu   |           5 | Development of a new method for teaching math                   | 2023-12-01 | 2029-12-31 | Pending review  | This project aims to develop a new method for teaching
 math that is more effective and engaging for students.   |
+-----+-------------------+-------------+-----------------------------------------------------------------+------------+------------+-----------------+-----------------------------------------------------------------
-----------------------------------------------------+
```

PROJECT TABLE by EVANS

```
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SELECT * FROM Project;
+-----+--------------------+--------------+-----------------------------------------------------------------------+------------+------------+--------------------+-----------------------------------------------------------------------+
| PID | email              | DepartmentID | ProjectName                                                           | StartDate  | EndDate    | Status             | Description                                                           |
+-----+--------------------+--------------+-----------------------------------------------------------------------+------------+------------+--------------------+-----------------------------------------------------------------------+
|   1 | jsmith@utep.edu    |            1 | Development of a new type of solar cell                               | 2023-08-01 | 2025-12-31 | progress           | This project aims to develop a new type of solar cell that is more efficient and less expensive.      |
|   2 | jdoe@utep.edu      |            2 | Development of a new drug for cancer treatment                        | 2023-09-01 | 2026-06-30 | Funded             | This project aims to develop a new drug for cancer treatment that is more effective and has fewer side effects. |
|   3 | mjones@utep.edu    |            3 | Development of a new algorithm for artificial intelligence            | 2023-10-01 | 2027-03-31 | Proposal submitted | This project aims to develop a new algorithm for artificial intelligence that is more efficient and accurate. |
|   4 | swilliams@utep.edu |            4 | Development of a new type of material for batteries                   | 2023-11-01 | 2028-09-30 | Not started        | This project aims to develop a new type of material for batteries that is more energy-dense and durable. |
|   5 | dbrown@utep.edu    |            5 | Development of a new method for teaching math                         | 2023-12-01 | 2029-12-31 | Pending review     | This project aims to develop a new method for teaching math that is more effective and engaging for students. |
+-----+--------------------+--------------+-----------------------------------------------------------------------+------------+------------+--------------------+-----------------------------------------------------------------------+
5 rows in set (0.0050 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SELECT * FROM project_people;
+-----+-----------------------------------------------+
| PID | people_involved                               |
+-----+-----------------------------------------------+
|   1 | Dr. Jane Doe (Chemistry)                      |
|   1 | Dr. John Smith (Electrical and Computer Engineering) |
|   1 | Dr. Michael Jones (Mechanical Engineering)    |
|   2 | Dr. David Brown (Biology)                     |
|   2 | Dr. Jane Doe (Computer Science)               |
|   2 | Dr. Susan Williams (Chemistry)                |
|   3 | Dr. Jane Doe (Computer Science)               |
|   3 | Dr. John Smith (Electrical and Computer Engineering) |
|   3 | Dr. Michael Jones (Mechanical Engineering)    |
|   4 | Dr. David Brown (Biology)                     |
|   4 | Dr. Michael Jones (Mechanical Engineering)    |
|   4 | Dr. Susan Williams (Chemistry)                |
|   5 | Dr. David Brown (Biology)                     |
|   5 | Dr. Jane Doe (Computer Science)               |
|   5 | Dr. Susan Williams (Education)                |
+-----+-----------------------------------------------+
15 rows in set (0.0248 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
```

8. SQL QUERIES on FUNCTIONAL REQUIREMENTS

Based on the current grant, extract the name of the faculty from the Faculty table by Maria

$$\pi_{Name}(\sigma_{Current_{grant}='NASAGrant'}(Faculty))$$

```
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SELECT Name FROM Faculty WHERE `Current_grants` = 'NASA Grant';
+-----------------+
| Name            |
+-----------------+
| Dr. David Brown |
+-----------------+
1 row in set (0.0708 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
```

On the basis of deparment_id, extract the email of the faculty by Maria

$$\pi_{Email}(\sigma_{Department_{id}=7}(Faculty))$$

```
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SELECT Email
                                                         -> FROM Faculty
                                                         -> WHERE Department_id = 7;
+-----------------+
| Email           |
+-----------------+
| mbrown@utep.edu |
+-----------------+
1 row in set (0.0752 sec)
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL >
```

A faculty is interested in finding out the the budget offered by ‘Heartflow’, how to do it by Kanishk

σName='HeartFlow'(πBudget(Agency))

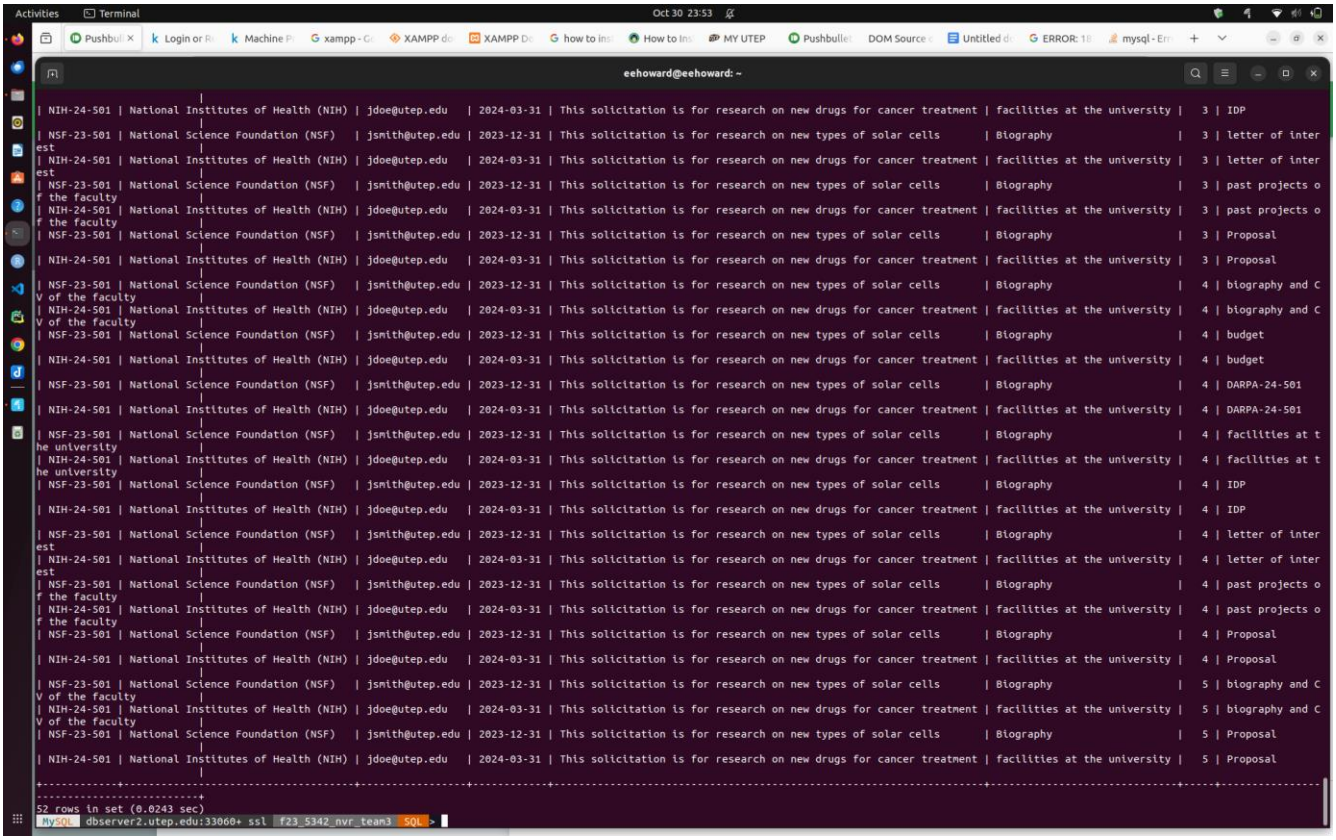
```
MySQL dbserver2.utep.edu:33060+ ssl f23_5342_nvr_team3 SQL > SELECT ABudget
                                                         -> FROM Agency
                                                         -> WHERE AName = 'Heartflow';
+-------------+
| ABudget     |
+-------------+
| $11 billion |
+-------------+
1 row in set (0.0049 sec)
```

faculty just has just the email address for a particular agency, on the basis of that, the faculty wants to find the address of the agency, give me the relational algebra and SQL code by Kanishk

πAddress(σEmail='given'(Agency))

```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT AAddress  FROM Agency  WHERE Aemail = 'nssc-contactcenter@nasa.gov';
+---------------------------------------+
| AAddress                              |
+---------------------------------------+
| 300 E Street SW, Washington, DC 20546 |
+---------------------------------------+
1 row in set (0.0048 sec)
```

Functional Requirements R16, R17 and R18 by Evans

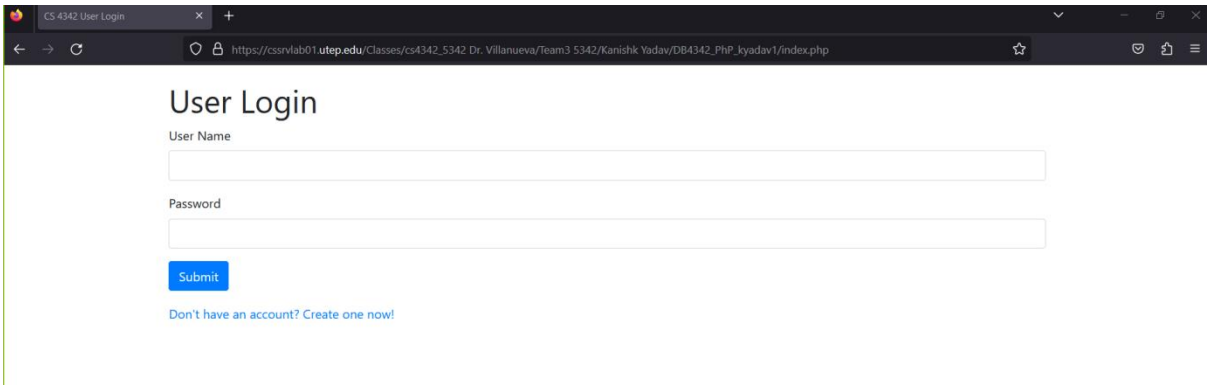


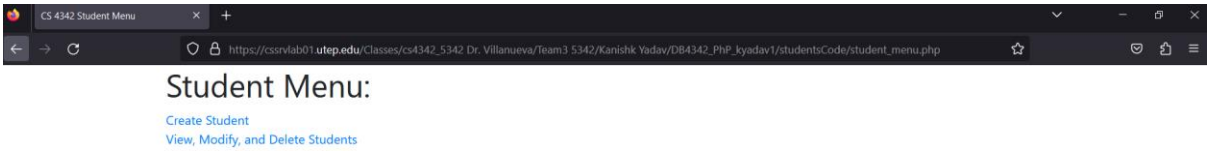
Functional Requirements knowing the names of the departments of the faculty that applied to a solicitation by Evans

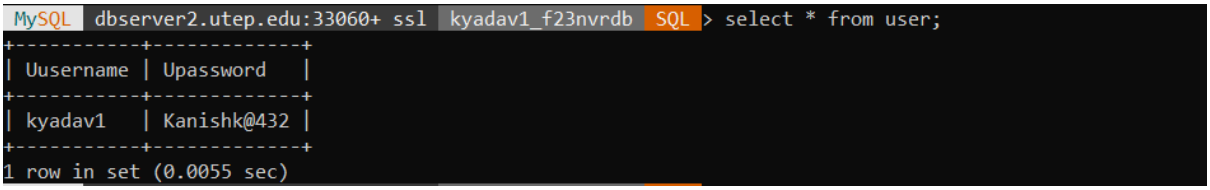
```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT * from departments;
+---------------+-------------------------------------+
| department_id | department_name                     |
+---------------+-------------------------------------+
|             1 | Electrical and Computer Engineering |
|             2 | Computer Science                    |
|             3 | Mechanical Engineering              |
|             4 | Chemistry and Biochemistry          |
|             5 | Biological Sciences                 |
|             6 | Nursing                             |
|             7 | Business                            |
|             8 | Education                           |
+---------------+-------------------------------------+
8 rows in set (0.0216 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > SELECT * from departmentts;
+-----------+--------------+-----------------------------------------+---------------------------+-----------------------------------------+--------------------------+
| CollegeID | DepartmentID | Name                                    | Chair                     | ContactInformation                      | Email                    |
+-----------+--------------+-----------------------------------------+---------------------------+-----------------------------------------+--------------------------+
|         1 |            1 | Accounting and Information Systems      | Adam Esplin               | Business Room 260                       | cobs_aisdept@utep.edu    |
|         1 |            2 | Economics and Finance                   | Nathan Ashby              | Business Room 236                       | econfin@utep.edu         |
|         1 |            3 | Marketing and Management                | José Humberto Ablanedo Rosas | Business Room 230                    | mandm@utep.edu           |
|         2 |            4 | Educational Leadership and Foundations  | Edna Martínez             | Education Building Room 414             | education@utep.edu       |
|         2 |            5 | Educational Psychology and Special Services | Beverly Argus Calva   | Education Building Room 701             | coepss@utep.edu          |
|         2 |            6 | Teacher Education                       | María Teresa de la Piedra | Education Building Room 414             | education@utep.edu       |
|         3 |            7 | Civil Engineering                       | Carlos Ferregut           | Engineering Building Room A-225         | civilengineering@utep.edu |
|         3 |            8 | Computer Science                        | Salamah Salamah           | Chemistry & Computer Science Building Room 3.1100 | cs@utep.edu |
+-----------+--------------+-----------------------------------------+---------------------------+-----------------------------------------+--------------------------+
8 rows in set (0.0244 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL >
```

9. GUI

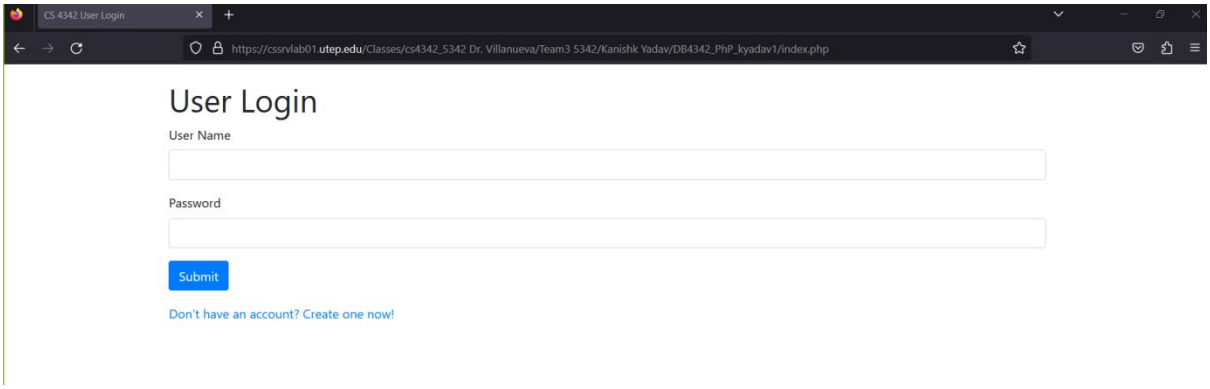
Graphical User Interface by Kanishk







Graphical User Interface by Evans



cssrvlab01.utep.edu/Classes/cs4342_5342%20Dr.%20Villanueva/Team3%205342/evans/cs4342project/studentsCode/student_menu.php

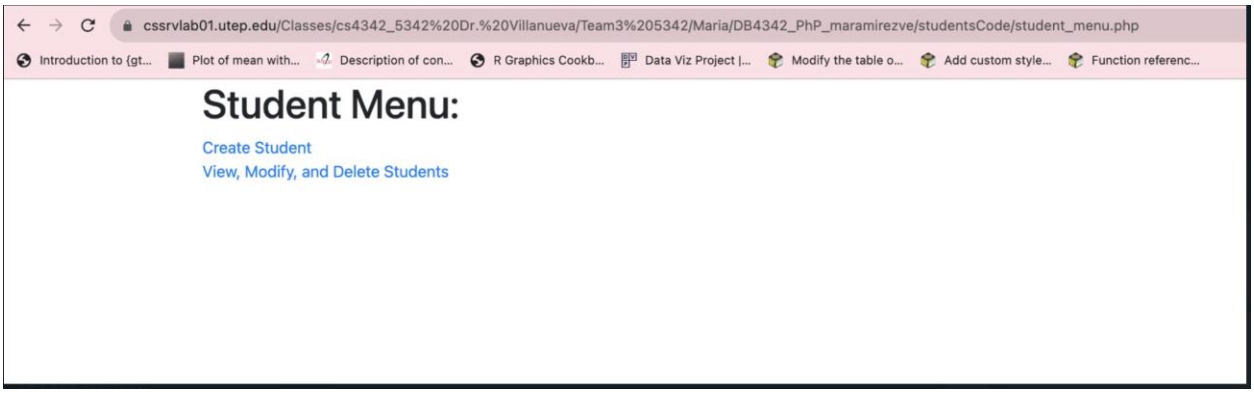
oard | Social Force | Contract | PYOMO | SQL | janet | beard | Books | Dockers | ERP | Evacuation | Flutter | Hub | jane | New folder | online

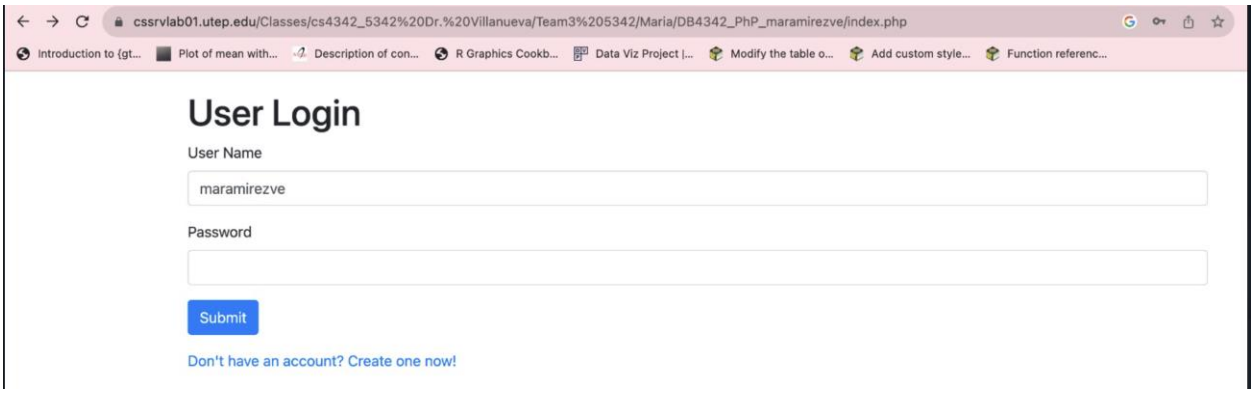
ssword manager to save the password for "https://cssrvlab01.utep.edu"?

Student Menu:

Create Student
View, Modify, and Delete Students

Graphical User Interface by Maria






```
MySQL  dbserver2.utep.edu:33060+ ssl  f23_5342_nvr_team3  SQL > USE maramirezve_f23nvrdb;
Default schema set to `maramirezve_f23nvrdb`.
Fetching global names, object names from `maramirezve_f23nvrdb` for auto-completion... Press ^C to stop.
Error during auto-completion cache update: Access denied; you need (at least one of) the PROCESS privilege(s) for this operation
MySQL  dbserver2.utep.edu:33060+ ssl  maramirezve_f23nvrdb  SQL > SHOW TABLES;
+--------------------------------+
| Tables_in_maramirezve_f23nvrdb |
+--------------------------------+
| cities                         |
| departments                    |
| faculty                        |
| faculty_research_interest      |
| faculty_students               |
| properties                     |
| student                        |
| user                           |
+--------------------------------+
8 rows in set (0.0885 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  maramirezve_f23nvrdb  SQL > SELECT * FROM USER;
+-------------+--------------+
| Uusername   | Upassword    |
+-------------+--------------+
| hahaha      | meme         |
| maramirezve | Uhquela!!!19 |
+-------------+--------------+
2 rows in set (0.0805 sec)
MySQL  dbserver2.utep.edu:33060+ ssl  maramirezve_f23nvrdb  SQL >
```

10. REFERENCES

- Elmasri, Ramez, Sham, Navathe (2015). "*Fundamentals of Database Systems". 2*021. 7th Edition
- Villanueuva-Rosales, Natalia (2023). Lecture 3 - Data Models & E/R Diagrams - [PowerPoint Slides]
- Villanueuva-Rosales, Natalia (2023). Lecture 5 - E/R to Relational mapping - [PowerPoint Slides]
- Villanueuva-Rosales, Natalia (2023). Project Resources - [MySQL Shell Installation]

11. APPENDIX A: ATTRIBUTION INFORMATION

The contributions of the team members for this assignment are as follows:

1. **Kanishk Yadav**
    a. Contributed to the refinement and revisions of the final scope.
    b. Created requirements a – d.
    c. Wrote assumptions a – c.
    d. Created E/R diagram for AGENCY entity.
    e. Created the relational model for AGENCY entity.
    f. Mapped AGENCY and SOLICITATION entities through the "publish" relation.
    g. Created personal SQL Team table.
    h. Reviewed Assignment 1 report.
    i. Normalized the schema for agency, agency_contact_information, Colleges
    j. Created SQL tables for agency, agency_contact_information, Colleges
    k. Inserted sample values for agency, agency_contact_information, Colleges
    l. Created his GUI
    m. Implemented subqueries

2. **Evans Etrue Howard**
    a. Contributed to the refinement of the scope and created the final draft.
    b. Created and refined functional requirements e – t.
    c. Wrote assumptions d – o.
    d. Created E/R diagrams for the entities SOLICITATION and PROJECTS.
    e. Integrated the entire group E/R diagram.
    f. Created the relational model for the entities SOLICITATION and PROJECTS.
    g. Mapped the SOLICITATION entity to the FACULTY entity via the "apply" relation.
    h. Personal SQL table creation.
    i. Created SQL Team Table
    j. Created and organized Assignment 1 draft report.
    k. Added references to the Assignment 1 report.
    l. Normalized, Solicitation, Projects, Department and Colleges
    m. Created SQL Tables for Solicitation, Projects, Department and Colleges
    n. Modified the Scope
    o. Inserted sample data into tables of Solicitation, Projects, Department and Colleges
    p. Implemented subqueries' for R16, R17 and R18

3. **Maria Ramirez**
    a. Created the first draft of the scope and contributed to its refinement.
    b. Created functional requirements u – aa.
    c. Contributed to assumptions p – r.
    d. Created E/R diagram for the FACULTY entity.

e. Created the relational model for the entity faculty.
f. Mapped the FACULTY entity and PROJECT entity in the relational model via the "Works on" relation.
g. Integrated the entire group's relational model.
h. Personal SQL table creation
i. Proofread Assignment 1 report.
j. Created Tables faculty, faculty_students, faculty_research_areas,
k. Normalized faculty, faculty_students, faculty_research_areas,
l. Inserted sample data for faculty, faculty_students, faculty_research_areas,
m. Implented subqurires