

## **DBMS Assignment 2**

### **PESUVariance - Learn, Grow & Challenge Yourself!**

**Team ID: H1**

**Names and respective SRN's:**

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**Semester: 5, Section: H**

#### **List of reasons/constraints to justify the choice of DBMS:**

The DBMS type chosen for our project is RDBMS. Below are the reasons behind our choice.

- Relational data is well known to be useful for simple data types, whereas NoSQL and other types of DBMS may be preferred for complex modeling. Since our data is relatively simple, we have chosen RDBMS
- Since we would require real time query management in terms of hosting competitions, quizzes and comments and posts, we would prefer RDBMS.
- RDBMS solves the ACID requirement with good durability and performance which is required for our project.
- RDBMS also allows for complicated queries like joins and other types that would be useful for our project.

Specifically, we are planning on using POSTGRESQL.

**About the files:**

The creation of all tables and database is done in [pesuvariance\\_create.sql](#) file, insertion of values which are not clob/blob types are done in [pesuvariance\\_insert.sql](#) file and the respective files are used to insert the values of tables in which there are blob/clob types.

[user.py](#) - user\_profile table values insertion.

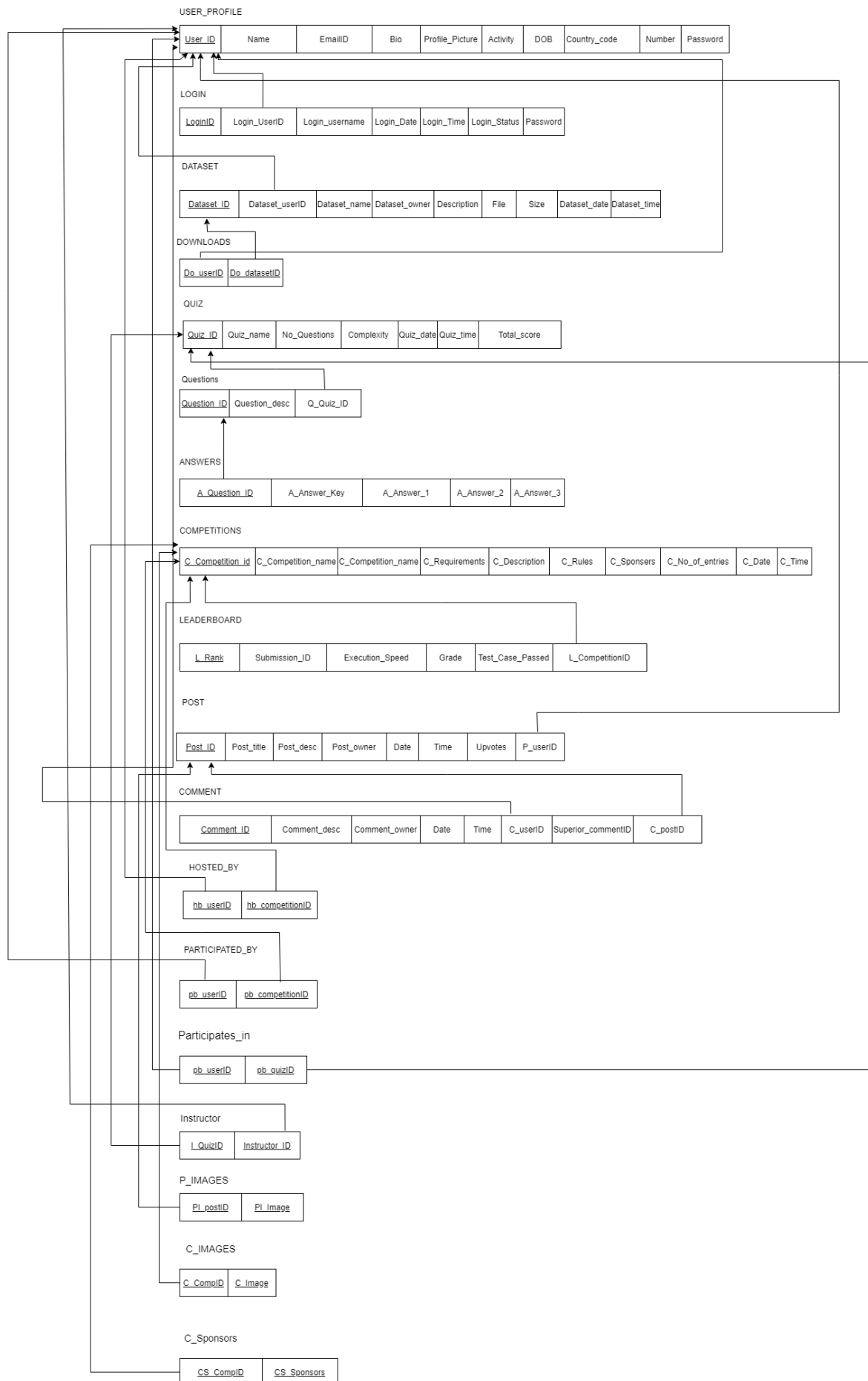
[dataset.py](#) - dataset table values insertion.

[c\\_images.py](#) - c\_images table values insertion.

[p\\_images.py](#) - p\_images table values insertion.

**Link to the relational schema file:** [Relational Schema](#)

## Relational Schema:



### OUTPUT SCREENSHOTS:

The below screenshot shows the output of running the `pesuvariance_create.sql` file.

[illegible]

Below screenshot shows the output which displays the pesuvariance database.

```
postgres=# \l
```

Name	Owner	Encoding	Collate	Ctype	Access privileges
company	postgres	UTF8	English_India.1252	English_India.1252	
dbms_lab4_peslug19cs502	postgres	UTF8	English_India.1252	English_India.1252	=Tc/postgres + postgres=CTc/postgres+ u3=CTc/postgres
lab3	postgres	UTF8	English_India.1252	English_India.1252	
pesuvariance	postgres	UTF8	English_India.1252	English_India.1252	
postgres	postgres	UTF8	English_India.1252	English_India.1252	
template0	postgres	UTF8	English_India.1252	English_India.1252	=c/postgres + postgres=CTc/postgres
template1	postgres	UTF8	English_India.1252	English_India.1252	=c/postgres + postgres=CTc/postgres

```
(7 rows)
```

```
postgres=# \c pesuvariance
You are now connected to database "pesuvariance" as user "postgres".
pesuvariance=# \d
```

List of relations			
Schema	Name	Type	Owner
public	answers	table	postgres
public	c_images	table	postgres
public	c_sponsors	table	postgres
public	comment	table	postgres
public	competitions	table	postgres
public	dataset	table	postgres
public	downloads	table	postgres
public	hosted_by	table	postgres
public	instructor	table	postgres
public	leaderboard	table	postgres
public	login	table	postgres
public	p_images	table	postgres
public	participated_by	table	postgres
public	participated_by_participationid_seq	sequence	postgres
public	participates_in	table	postgres
public	post	table	postgres
public	questions	table	postgres
public	quiz	table	postgres
public	user_profile	table	postgres

```
(19 rows)
```

Below screenshot shows the USER\_PROFILE Relation.

```

pesuvariance=# \d user_profile
                                Table "public.user_profile"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
 user_id      | character varying(5) |           | not null |
  name        | character varying(30) |           | not null |
 emailid      | character varying(30) |           | not null |
  type        | character varying(30) |           | not null | 'Student'::character varying
   bio        | character varying(60) |           |           |
profile_picture | bytea           |           |           |
 activity     | text            |           |           |
  dob         | date            |           | not null |
country_code   | integer         |           | not null |
  number      | integer         |           | not null |
 password     | character varying(60) |           | not null |

Indexes:
    "user_profile_pkey" PRIMARY KEY, btree (user_id)
Check constraints:
    "user_profile_dob_check" CHECK (dob >= '1960-01-01'::date AND dob <= '2004-01-01'::date)
Referenced by:
    TABLE "comment" CONSTRAINT "comment_c_userid_fkey" FOREIGN KEY (c_userid) REFERENCES user_profile(user_id)
    TABLE "dataset" CONSTRAINT "dataset_dataset_userid_fkey" FOREIGN KEY (dataset_userid) REFERENCES user_profile(user_id)
    TABLE "downloads" CONSTRAINT "downloads_do_userid_fkey" FOREIGN KEY (do_userid) REFERENCES user_profile(user_id)
    TABLE "hosted_by" CONSTRAINT "hosted_by_hb_userid_fkey" FOREIGN KEY (hb_userid) REFERENCES user_profile(user_id)
    TABLE "instructor" CONSTRAINT "instructor_instructor_id_fkey" FOREIGN KEY (instructor_id) REFERENCES user_profile(user_id)
    TABLE "login" CONSTRAINT "login_login_userid_fkey" FOREIGN KEY (login_userid) REFERENCES user_profile(user_id)
    TABLE "participated_by" CONSTRAINT "participated_by_pb_userid_fkey" FOREIGN KEY (pb_userid) REFERENCES user_profile(user_id)
    TABLE "participates_in" CONSTRAINT "participates_in_pb_userid_fkey" FOREIGN KEY (pb_userid) REFERENCES user_profile(user_id)
    TABLE "post" CONSTRAINT "post_p_userid_fkey" FOREIGN KEY (p_userid) REFERENCES user_profile(user_id)

```

Below Screenshot displays the LOGIN Relation.

```

pesuvariance=# \d login
                                Table "public.login"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
 login_id     | character varying(5) |           | not null |
 login_userid | character varying(5) |           | not null |
 login_username | character varying(30) |           | not null |
 login_date   | date              |           | not null |
 login_time   | time without time zone |           | not null |
 login_status | character varying(3) |           | not null |
 password     | character varying(60) |           | not null |

Indexes:
    "login_pkey" PRIMARY KEY, btree (login_id)
    "login_login_username_key" UNIQUE CONSTRAINT, btree (login_username)
Foreign-key constraints:
    "login_login_userid_fkey" FOREIGN KEY (login_userid) REFERENCES user_profile(user_id)

```

Below Screenshot Displays the Dataset Relation.

```

pesuvariance=# \d dataset
                                Table "public.dataset"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
 dataset_id   | character varying(5) |           | not null |
 dataset_userid | character varying(5) |           | not null |
 dataset_name | character varying(30) |           | not null |
 dataset_owner | character varying(30) |           | not null |
 description  | character varying(500) |           |           |
  file        | text              |           | not null |
   size       | character varying(10) |           | not null |
 dataset_date | date              |           | not null |
 dataset_time | time without time zone |           | not null |

Indexes:
    "dataset_pkey" PRIMARY KEY, btree (dataset_id)
    "dataset_dataset_name_key" UNIQUE CONSTRAINT, btree (dataset_name)
Foreign-key constraints:
    "dataset_dataset_userid_fkey" FOREIGN KEY (dataset_userid) REFERENCES user_profile(user_id)
Referenced by:
    TABLE "downloads" CONSTRAINT "downloads_do_datasetid_fkey" FOREIGN KEY (do_datasetid) REFERENCES dataset(dataset_id)

```

Below Screenshot Displays the Downloads Relation.

```
pesuvariance=# \d downloads
          Table "public.downloads"
   Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 do_userid     | character varying(5)   |           | not null |
 do_datasetid  | character varying(5)   |           | not null |
Indexes:
    "downloads_pkey" PRIMARY KEY, btree (do_userid, do_datasetid)
Foreign-key constraints:
    "downloads_do_datasetid_fkey" FOREIGN KEY (do_datasetid) REFERENCES dataset(dataset_id)
    "downloads_do_userid_fkey" FOREIGN KEY (do_userid) REFERENCES user_profile(user_id)
```

Below Screenshot displays the Quiz Relation.

```
pesuvariance=# \d quiz
          Table "public.quiz"
   Column      |          Type          | Collation | Nullable |          Default
-----+-----+-----+-----+-----
 quiz_id       | character varying(5)   |           | not null |
 quiz_name     | character varying(10)  |           | not null |
 no_questions  | integer                |           | not null |
 complexity    | character varying(10)  |           |          | 'Medium'::character varying
 quiz_date     | date                   |           | not null | CURRENT_DATE
 quiz_time     | time without time zone |           | not null |
 total_score   | numeric                |           |          |
Indexes:
    "quiz_pkey" PRIMARY KEY, btree (quiz_id)
Referenced by:
    TABLE "instructor" CONSTRAINT "instructor_i_quizid_fkey" FOREIGN KEY (i_quizid) REFERENCES quiz(quiz_id)
    TABLE "participates_in" CONSTRAINT "participates_in_pb_quizid_fkey" FOREIGN KEY (pb_quizid) REFERENCES quiz(quiz_id)
    TABLE "questions" CONSTRAINT "questions_q_quiz_id_fkey" FOREIGN KEY (q_quiz_id) REFERENCES quiz(quiz_id)
```

Below is the screenshot of the Questions Relation.

```
pesuvariance=# \d questions
          Table "public.questions"
   Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 question_id   | character varying(5)   |           | not null |
 question_desc | character varying(100) |           | not null |
 q_quiz_id     | character varying(5)   |           | not null |
Indexes:
    "questions_pkey" PRIMARY KEY, btree (question_id)
Foreign-key constraints:
    "questions_q_quiz_id_fkey" FOREIGN KEY (q_quiz_id) REFERENCES quiz(quiz_id)
Referenced by:
    TABLE "answers" CONSTRAINT "answers_a_question_id_fkey" FOREIGN KEY (a_question_id) REFERENCES questions(question_id)
```

Below is the screenshot of the Answers Relation.

```
pesuvariance=# \d answers
          Table "public.answers"
   Column      |          Type          | Collation | Nullable | Default
-----+-----+-----+-----+-----
 a_question_id | character varying(5)   |           | not null |
 a_answer_key  | character varying(5)   |           | not null |
 a_answer_1    | character varying(100) |           | not null |
 a_answer_2    | character varying(100) |           | not null |
 a_answer_3    | character varying(100) |           | not null |
Indexes:
    "answers_pkey" PRIMARY KEY, btree (a_question_id)
Foreign-key constraints:
    "answers_a_question_id_fkey" FOREIGN KEY (a_question_id) REFERENCES questions(question_id)
```

Below is the screenshot of the Competitions Relation.

```
pesuvvariance=# \d competitions
```

Column	Type	Collation	Nullable	Default
c_competition_id	character varying(10)		not null	
c_competition_name	character varying(50)		not null	
c_requirements	character varying(100)		not null	
c_description	character varying(100)		not null	
c_rules	character varying(100)		not null	
c_sponsors	character varying(100)			
c_no_of_entries	integer			
c_date	date		not null	
c_time	time without time zone		not null	
c_image	bytea			

Indexes:  
 "competitions\_pkey" PRIMARY KEY, btree (c\_competition\_id)

Referenced by:  
 TABLE "c\_images" CONSTRAINT "c\_images\_c\_compid\_fkey" FOREIGN KEY (c\_compid) REFERENCES competitions(c\_competition\_id)  
 TABLE "c\_sponsors" CONSTRAINT "c\_sponsors\_cs\_compid\_fkey" FOREIGN KEY (cs\_compid) REFERENCES competitions(c\_competition\_id)  
 TABLE "hosted\_by" CONSTRAINT "hosted\_by\_hb\_competitionid\_fkey" FOREIGN KEY (hb\_competitionid) REFERENCES competitions(c\_competition\_id)  
 TABLE "leaderboard" CONSTRAINT "leaderboard\_l\_competitionid\_fkey" FOREIGN KEY (l\_competitionid) REFERENCES competitions(c\_competition\_id)  
 TABLE "participated\_by" CONSTRAINT "participated\_by\_pb\_competitionid\_fkey" FOREIGN KEY (pb\_competitionid) REFERENCES competitions(c\_competition\_id)

Below is the screenshot of the Leaderboard Relation.

```
pesuvvariance=# \d leaderboard
```

Column	Type	Collation	Nullable	Default
l_rank	integer		not null	
submission_id	integer		not null	
execution_speed	real		not null	
grade	integer		not null	0
test_case_passed	integer		not null	0
l_competitionid	character varying(10)		not null	

Indexes:  
 "leaderboard\_pkey" PRIMARY KEY, btree (l\_rank)  
 "leaderboard\_submission\_id\_key" UNIQUE CONSTRAINT, btree (submission\_id)

Foreign-key constraints:  
 "leaderboard\_l\_competitionid\_fkey" FOREIGN KEY (l\_competitionid) REFERENCES competitions(c\_competition\_id)

Below is the screenshot of the Post Relation.

```
pesuvvariance=# \d post
```

Column	Type	Collation	Nullable	Default
post_id	character varying(5)		not null	
post_title	character varying(50)		not null	
post_desc	character varying(500)		not null	
post_owner	character varying(30)		not null	
p_date	date		not null	
p_time	time without time zone		not null	
upvotes	integer			0
p_userid	character varying(5)		not null	

Indexes:  
 "post\_pkey" PRIMARY KEY, btree (post\_id)

Foreign-key constraints:  
 "post\_p\_userid\_fkey" FOREIGN KEY (p\_userid) REFERENCES user\_profile(user\_id)

Referenced by:  
 TABLE "comment" CONSTRAINT "comment\_c\_postid\_fkey" FOREIGN KEY (c\_postid) REFERENCES post(post\_id)  
 TABLE "p\_images" CONSTRAINT "p\_images\_pi\_postid\_fkey" FOREIGN KEY (pi\_postid) REFERENCES post(post\_id)

Below is the screenshot of the Comment Relation.

```

pesuvariance=# \d comment
                                Table "public.comment"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
comment_id    | character varying(5) |           | not null |
comment_desc  | character varying(100) |           | not null |
comment_owner | character varying(30) |           | not null |
comment_date  | date              |           | not null |
comment_time  | time without time zone |           | not null |
c_userid      | character varying(5) |           | not null |
superior_commentid | character varying(5) |           |          | NULL::character varying
c_postid      | character varying(5) |           | not null |

Indexes:
    "comment_pkey" PRIMARY KEY, btree (comment_id)
Foreign-key constraints:
    "comment_c_postid_fkey" FOREIGN KEY (c_postid) REFERENCES post(post_id)
    "comment_c_userid_fkey" FOREIGN KEY (c_userid) REFERENCES user_profile(user_id)
    "comment_superior_commentid_fkey" FOREIGN KEY (superior_commentid) REFERENCES comment(comment_id)
Referenced by:
    TABLE "comment" CONSTRAINT "comment_superior_commentid_fkey" FOREIGN KEY (superior_commentid) REFERENCES comment(comment_id)

```

Below is the screenshot of the Hosted\_BY relation.

```

pesuvariance=# \d hosted_by
                                Table "public.hosted_by"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
hb_userid     | character varying(5) |           | not null |
hb_competitionid | character varying(5) |           | not null |

Indexes:
    "hosted_by_pkey" PRIMARY KEY, btree (hb_userid, hb_competitionid)
Foreign-key constraints:
    "hosted_by_hb_competitionid_fkey" FOREIGN KEY (hb_competitionid) REFERENCES competitions(c_competition_id)
    "hosted_by_hb_userid_fkey" FOREIGN KEY (hb_userid) REFERENCES user_profile(user_id)

```

Below is the screenshot of the PARTICIPATED\_BY Relation.

```

pesuvariance=# \d participated_by
                                Table "public.participated_by"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
pb_userid     | character varying(5) |           | not null |
pb_competitionid | character varying(5) |           | not null |
participationid | integer          |           | not null | nextval('participated_by_participationid_seq'::regclass)

Indexes:
    "participated_by_pkey" PRIMARY KEY, btree (pb_userid, pb_competitionid)
Foreign-key constraints:
    "participated_by_pb_competitionid_fkey" FOREIGN KEY (pb_competitionid) REFERENCES competitions(c_competition_id)
    "participated_by_pb_userid_fkey" FOREIGN KEY (pb_userid) REFERENCES user_profile(user_id)

```

Below is the screenshot of the Participates\_IN Relation.

```

pesuvariance=# \d participates_in
                                Table "public.participates_in"
  Column      |      Type      | Collation | Nullable |      Default
-----+-----+-----+-----+-----
pb_userid     | character varying(5) |           | not null |
pb_quizid     | character varying(5) |           | not null |

Indexes:
    "participates_in_pkey" PRIMARY KEY, btree (pb_userid, pb_quizid)
Foreign-key constraints:
    "participates_in_pb_quizid_fkey" FOREIGN KEY (pb_quizid) REFERENCES quiz(quiz_id)
    "participates_in_pb_userid_fkey" FOREIGN KEY (pb_userid) REFERENCES user_profile(user_id)

```



Below is the screenshot of the Instructor Relation.

```
pesuvariance=# \d instructor
Table "public.instructor"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 i_quizid    | character varying(5) |          | not null |
instructor_id | character varying(5) |          | not null |
Indexes:
    "instructor_pkey" PRIMARY KEY, btree (i_quizid, instructor_id)
Foreign-key constraints:
    "instructor_i_quizid_fkey" FOREIGN KEY (i_quizid) REFERENCES quiz(quiz_id)
    "instructor_instructor_id_fkey" FOREIGN KEY (instructor_id) REFERENCES user_profile(user_id)
```

Below is the screenshot of the C\_Sponsors Relation.

```
pesuvariance=# \d C_Sponsors
Table "public.c_sponsors"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 cs_compid    | character varying(5) |          | not null |
 cs_sponsors | character varying(20) |          | not null |
Indexes:
    "c_sponsors_pkey" PRIMARY KEY, btree (cs_compid, cs_sponsors)
Foreign-key constraints:
    "c_sponsors_cs_compid_fkey" FOREIGN KEY (cs_compid) REFERENCES competitions(c_competition_id)
```

Below is the screenshot of the P\_Images Relation.

```
pesuvariance=# \d p_images
Table "public.p_images"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 pi_postid    | character varying(5) |          | not null |
 pi_image     | bytea           |          | not null |
Indexes:
    "p_images_pkey" PRIMARY KEY, btree (pi_postid, pi_image)
Foreign-key constraints:
    "p_images_pi_postid_fkey" FOREIGN KEY (pi_postid) REFERENCES post(post_id)
```

Below is the screenshot of the C\_Images Relation.

```
pesuvariance=# \d c_images
Table "public.c_images"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 c_compid    | character varying(5) |          | not null |
 c_image     | bytea           |          | not null |
Indexes:
    "c_images_pkey" PRIMARY KEY, btree (c_compid, c_image)
Foreign-key constraints:
    "c_images_c_compid_fkey" FOREIGN KEY (c_compid) REFERENCES competitions(c_competition_id)
```

Below is the screenshot of insertion of user\_profile table values.

[illegible]

Below is the screenshot of insertion of dataset table values.

[illegible]

Below is the screenshot of insertion from `pesuvariance_insert.sql` file.

[illegible]

Below is the screenshot of insertion of c\_images table values.

```
C:\Users\Sravya Yepuri\Desktop\PESUVariance>python c_images.py
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
```

Below is the screenshot of insertion of p\_images table values.

```
C:\Users\Sravya Yepuri\Desktop\PESUVariance>python p_images.py
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
data inserted successfully
```

### **Contribution of each member:**

Shrikar Madhu - Worked on pesuvariance\_create.py, blob/clob data and report.

Sravya Yepuri - Worked on pesuvariance\_insert.py, blob/clob data and report.

Sri Ramya Priya Vedula - Worked on pesuvariance\_create.py, blob/clob data and report.

Yousha Mahamuni - Worked on pesuvariance\_insert.py, blob/clob data and report.

### **Time spent to complete assignment 2:**

Creation statements - 3 Hours

Insert statements - 4 Hours

Exploring and inserting images and files (blob/clob data) - 4 Hours

Making Final Report - 4 Hours

Google Drive Link:

<https://drive.google.com/drive/folders/1w-UWcaEjJO51bETI1a7BGpEGCYos6vSR?usp=sharing>