

1. What is a **relation**?

- A relation is essentially a table within a database that holds data. It is made up of rows and columns

2. What is a **tuple**?

- Each row is a tuple, as it refers to all the columns pertaining to an entry or instance

3. What is an **attribute**?

- The columns within a relation are the attributes, as they each are used to identify or relate to the entry

4. What is a **domain**? Give one example domain for a column in this lab.

- A domain refers to the rules we have within our relation./ For instance, we can add a rule that assures we have the class year within a certain range, and we can also add a rule that limits the varchar range to two characters, etc..

5. Explain **schema** vs **instance** with one example.

- A schema is a way to specify the databases, containing all the rules, attributes, and domains as well. For instance, when we create a table, we have the column names, we have the rules, and we also decide if we want primary keys or not. An instance is a specific entry within our data. For instance, we enter a student that fits the domain and schema of the relation, and we can use the key to find the student along with the attributes referring to them.

6. What is a **key**? Why do we use a **primary key**?

- A key is what we use to uniquely identify a tuple within a relation. We use primary keys in order to identify the specific tuple we need in case tuples have identical data (like name, grade, age, etc)

Query Query History

```
1 SELECT * FROM Students
2 ORDER BY class_year
```

Data Output Messages Notifications

≡+ 📄 ▼ 📋 ▼ 🗑️ 🗄️ ⬇️ 📈 SQL

	student_id [PK] integer	name character varying (250)	major character varying (2)	class_year integer
1	1	Amina Johnson	CS	2026
2	5	Nia Williams	PS	2026
3	2	David Chen	EE	2027
4	3	Maria Lopez	BI	2028
5	6	Olu Adeyemi	CS	2028
6	4	Jordan Smith	MA	2029

Query Query History

```
1 SELECT * FROM Enrollments
2 WHERE grade IS NULL;
```

Data Output Messages Notifications



	student_id integer	course_id integer	grade integer
1	6	101	[null]
2	1	102	[null]

Query Query History

```
1 SELECT * FROM Students
2 WHERE name LIKE 'A%';
```

Data Output Messages Notifications

	<div>student_id</div> <div>[PK] integer</div>	<div>name</div> <div>character varying (250)</div>	<div>major</div> <div>character varying (2)</div>	<div>class_year</div> <div>integer</div>
1	1	Amina Johnson	CS	2026

Query Query History

```
1 SELECT * FROM Courses
2 WHERE credits >= 3;
```

Data Output Messages Notifications



	course_id [PK] integer	title character varying (250)	credits integer
1	101	Introduction to Computer Scien...	4
2	102	Calculus I	4
3	103	Database Systems	3

Query Query History

```
1 SELECT * FROM Students
2 WHERE major='CS';
```

Query Query History

1 **SELECT** **name**, **student\_id** **FROM** Students

Data Output Messages Notifications

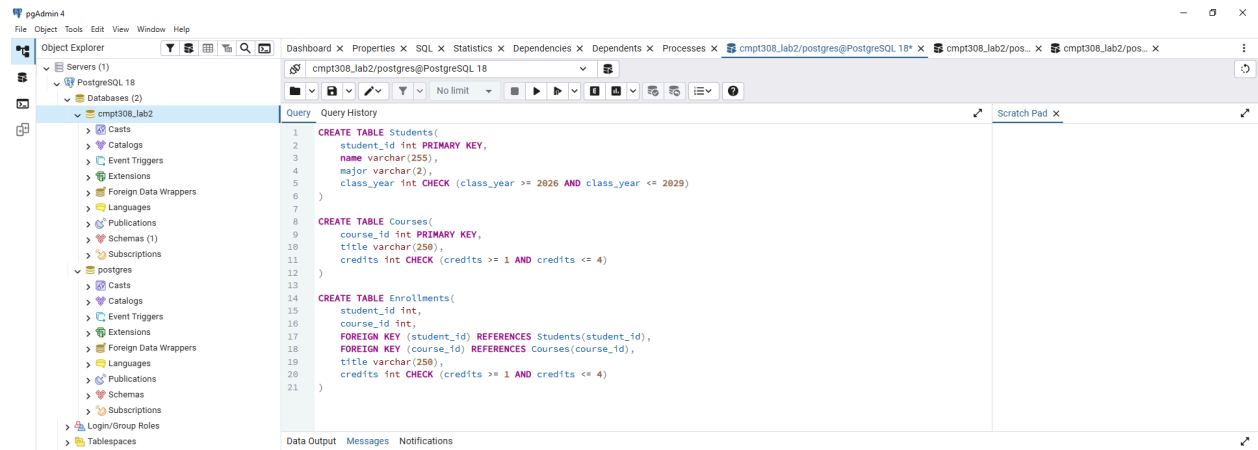


	<b>name</b> character varying (250)	<b>student_id</b> [PK] integer
1	Amina Johnson	1
2	David Chen	2
3	Maria Lopez	3
4	Jordan Smith	4
5	Nia Williams	5
6	Olu Adeyemi	6

	student_id integer	course_id integer	grade integer
1	1	101	98
2	1	103	95
3	6	102	86
4	6	103	83
5	4	102	87
6	5	104	100
7	6	101	[null]
8	1	102	[null]

	student_id [PK] integer	name character varying (250)	major character varying (2)	class_year integer
1	1	Amina Johnson	CS	2026
2	2	David Chen	EE	2027
3	3	Maria Lopez	BI	2028
4	4	Jordan Smith	MA	2029
5	5	Nia Williams	PS	2026
6	6	Olu Adeyemi	CS	2028

	course_id [PK] integer	title character varying (250)	credits integer
1	101	Introduction to Computer Scien...	4
2	102	Calculus I	4
3	103	Database Systems	3
4	104	Public Speaking	2



$\pi$  student\_id, name from students

$\sigma$  major='cs'

[Github:](#)

<https://github.com/MrMir247/Miracle-s-DBM-Repo.git>