To complete this homework, visit the JackDB website (`https://app.jackdb.com`). You should have already received an email from JackDB inviting you to create an account. Please follow those instructions. Once you complete them, you should see two databases "College Applications" (the one we've been looking at in class) and "Pizza."

Turning in your work. Your work on JackDB will not be saved. You must save your work separately. You can use whatever text editor you are most comfortable with (Google Doc, MS Word, etc.) or you can write out your answers by hand. Be sure to *clearly number* your queries.

This assignment is **due on Sunday, Feb 26nd, 2017, at 11:59pm**. You will turn it in by uploading to Gradescope (you will receive a separate email). Note: if you write out your answers by hand, you will need to scan or upload a photo of your work. Be sure to leave enough time for this.

Tips

Before you get started on these exercises, you are *strongly encouraged* to review the lecture notes from class and *try out* all of the queries from class on the College Applications database (also available at the site above).

When working on these exercises, you are strongly encouraged to review the assigned readings and check the lecture handoutsas well as lecture slides (both available on the course website).

For each query, *check that your query is returning the correct answer!* The database is small enough that it's easy to check each query answer "by hand." (You can do `select *` to simply see the contents of each table – e.g. `select * from Eats`.)

Start early! I suggest trying to tackle at least two queries person day.

Schema

The relational schema for this database is:

```
Person(name text, age int, gender text);
Frequents(name text, pizzeria text);
Eats(name text, pizza text);
Serves(pizzeria text, pizza text, price decimal);
```

Queries

1. Find pizzerias that serve pepperoni or cheese pizza, ordered by price from least expensive to most expensive. The result should include the name of the pizzeria, the kind of pizza,

and the price.

2. Straw Hat is having a sale of 10% off all pizzas. Write a query that returns a list of Straw Hat's pizzas and their prices, with the prices updated to reflect the sale. Name the updated price column "saleprice."

3. Find pizzerias that have the word Pizza in their name. Each name should appear only once.

4. Find the name of the most expensive pizza. Your query should return a table with a single row and a column that contains the name of the most expensive pizza served.

5. Find the names of pizzerias that serve pizzas that cost under $9 and are either pepperoni or cheese. The result should include only the name of the pizzeria and duplicate names should be eliminated.

6. Are there pizzerias that serve pizzas that Dan likes to eat for under $8? Write a query that returns the pizza, the pizzeria where it's served, and the price of the pizza at that pizzeria. (Note: Dan may not necessarily frequent this pizzeria.)

7. Names of people together with the pizzas they like to eat along with where they like to eat it. The result should be a table in which each row consists of (a) the name of a person, (b) the kind of pizza, and (c) the name of pizzeria. Such a row means that this person eats that kind of pizza, frequents that pizzeria, and that pizzeria serves that kind of pizza.

8. Find the names of all females who eat at least one pizza served by Straw Hat. (Note: The pizza need not be eaten at Straw Hat.) Each person's name should appear at most once.

9. Find pairs of pizzerias who sell the same kind of pizza for the same price. The result should include both the names of both pizzerias along with the pizza and the price. Hint: The key to solving this query is to do a self-join – i.e., to join a table with itself. Before you attempt the query, try running the following example query. This query finds pairs of people who are the same age. What do you notice about the result? Try modifying the query so that each person doesn't appear with himself/herself.

```
select distinct P.name, P2.name
from Person P, Person P2
where P.age = P2.age
```

10. Find all pizzas either Amy or Fay (or both) eat.

11. Find all pizzas that both Amy and Fay eat. Hint: this is harder than it looks.

12. Find the price of the most expensive pizza served by Pizza Hut.

13. Find the age of the oldest person (or people) who eat mushroom pizza.

14. Find the price of the least expensive pizza served by each pizzeria.

15. Find the number of pizzas made by each pizzeria.

16. Find the number of distinct kinds of pizza eaten by each gender.

17. Find the names of pizzerias who serves at least 4 kinds of pizza.

18. Find the average number of pizzas made by a pizzeria. Hint: first do a subquery that computes the number of pizzas made by each pizzeria.

19. Find the average number of pizza kinds eaten by each gender. Hint: use the WITH keyword to create a table called pizzaCounts with attributes name, gender and numPizzas where numPizzas is the number of types pizzas that person eats. Then issue a query on this new table.

20. Find the names of people who frequent at least three pizzerias that serve pizzas that they eat. This is a challenging query. The final answer should include the person named Hil (and in fact only Hil). Hil frequents Dominos, Pizza Hut, and Straw Hut and each of those establishes serves at least one pizza that Hil eats (specifically, cheese, though Pizza Hut also serves supreme).