Setup

Make sure the computer is in Windows; if not, restart. Sign in to the computer: your user name is `colgate\your-colgate-username` where `your-colgate-username` is the first part of your email. For example, my email is `mhay@colgate.edu` so I would type `colgate\mhay`. Open a web browser and go to this link: `https://account.jetbrains.com/a/18kv9uyi`. Please create a JetBrains account (and remember your password for the next step).

Open up JetBrains Data Grip (it's on the desktop) and log in with your JetBrains account. To connect to the server in Data Grip, do the following:

- Go to File > Data Sources...

- Click on the "+" in the top left corner to add a data source and select "PostgresSQL" data source. (Do **not** click on PostgresSQL in the section labeled "Drivers.")

- Fill in the values as follows: Host: `54.90.166.165`, Database: `college_apps`, User: `core109s`, Password: `idwt?colgate`

- Click "Test Connection". If it says something like "Download missing drivers" at the bottom, go ahead and do that. Then click OK.

SQL Introduction

Schema for examples:

```
apply(sid, cname, major, decision)
college(cname, state, enrollment)
student(sid, sname, gpa, sizehs)
```

We can query this data using a "select from where" statement. All statements must end with a semicolon.

- The select clause controls which attributes are included in the query answer. Let's query for student names and their GPAs.

  ```
  select sname, gpa from student;
  ```

- And `select *` is short hand for all columns.

  ```
  select * from student;
  ```

- You can also use the select clause perform mathematical (and other) operations on the attribute values. Let's make a new attribute called *scaled GPA*. Idea is to increase GPA for those at large high schools, specifically scaledGPA = (GPA × sizeHS/1000). Use the `AS` keyworkd to name the attribute `scaledgpa`.

  ```
  select sname, (gpa * sizehs / 1000) as scaledgpa
  from student;
  ```

- Watch out for integer division! Try out the following query. Are attributes `division1` and `division2` equal in the result?

```
select sizehs, (sizehs / 1000) as division1, (sizehs / 1000.0) as division2
from student;
```

- Use the where clause to filter the results. You can compare an attribute value to a *literal* value. Let's find students with a high GPA (at least 3.6). Return the student name along with their GPA.

```
select sname, GPA
from student
where GPA >= 3.6;
```

To compare a string attribute against a specific string literal, you put the string literal in single quotes. Let's find student ids and the names of the colleges to which they were admitted.

```
select sid, cname
from apply
where decision = 'Y';
```

- When filtering on a string attribute, you can also search for certain patterns rather than exact string literals. Use the `LIKE` keyword and the % character. The % character is a "wildcard" that matches any sequence of zero or more characters.

Let's find applications to colleges whose name starts with 'C'.

```
select *
from apply
where cname LIKE 'C%';
```

Let's find students whose name has a lower case 'a' somewhere in it.

```
select *
from student
where sname like '%a%';
```

- You can also compare two attribute values with each other. Let's find students whose student id is larger than their high school size (admittedly a rather odd query).

```
select *
from student
where sid > sizehs;
```

- Use logical connectives such as "and" and "or" to combine different filters. Let's find the sids of students who applied to major in computer science (CS) and were admitted.

```
select *
from apply
where major = 'CS' and decision = 'Y';
```