Week 3: Simple SQL

Keywords

- **WHERE** - Keyword to receive only records that match a given constraint

```
SELECT * FROM Employee WHERE salary >= 150000
```

  - *Ex.* Selects all employees that have taken CS 327E. Just kidding, it actually selects all employees with a salary greater than or equal to 150000.
- **ORDER BY** - Keyword to receive records sorted by a field

```
SELECT * FROM Employee WHERE salary >= 150000 ORDER BY age
```

  - *Ex.* Selects all employees that have a salary greater than or equal to 150000, and orders them by their age.
  - The ordering is naturally ascending
- **LIMIT** - Keyword to limit the number of records returned to some number

```
SELECT emp_name FROM Employee WHERE hours_worked > 40
LIMIT 100
```

  - *Ex.* Selects the employee name of the first 100 employees that have worked over 40 hours.
  - NOTE: In this example, the records returned are not ordered - this means one employee could have worked 60 hours, while another down the list may have worked only 53 hours.

Joins

- **Inner Join -** Returns the intersection of two tables, such that all records returned match the constraints of the join.

```
SELECT emp_name, dept_name FROM Employee JOIN Department
ON emp_dep = depid
```

  - *Ex.* This query will return the emp_name and dept_name of all records from Employee and Department such that each emp_name is paired with the corresponding dept_name

- ○ Failure to add the **ON** clause will result in a **cross product.** This means for our example, you will get the permutations of all possible combinations between every record in Employee, and every element in Department.
- **Left/Right Outer Join** - Returns the intersection of two tables, however the table on the specified side of the outer join will have all their records returned, even if the records fail to find a match.

```
SELECT emp_name, dept_name FROM Employee LEFT JOIN
Department ON emp_dep = depid
```

  - ○ *Ex.* This will return the emp_name and dept_name of all records from Employee, and those that are able to inner join with a record with Department will also return with a corresponding dept_name.
    - ■ All returned records from the table affected by the outer join that do not inner join with any value from the other table will return NULL for any fields associated with the other table.
- **Full Outer Join** - Returns listings of all records from both tables

```
SELECT emp_name, dept_name FROM Employee FULL JOIN
Department
```

  - ○ *Ex.* This will return the employee name and department names of all departments and all employees.