

This file contains exercise assignments for us to solve in the first exercise session. Prepare by reading this document and at least think of how to solve the tasks.

There are SQL files prepared for each task on the course page.

Exercise 1A: The electoral system

Every four years, the world gets a reason to re-learn the intricacies of the US electoral system. You will be making a little database that can compute election results from vote counts.

Make a table with a column for state names (or abbreviations), columns for Biden and Trump votes respectively and a column for number of electors.

Then create a view called StateResults that shows for each state: The name of the state, the name of the winning candidate (Biden or Trump) and the number of electors.

Finally make a query that shows the total number of electoral votes of both candidates (the result should have two rows for the two candidates).

You can use this data (inspired by actual events) to test your solution:

```
-- Test data
INSERT INTO States VALUES ('NV', 588252, 580605, 6);
INSERT INTO States VALUES ('AZ', 3215969, 3051555, 11);
INSERT INTO States VALUES ('GA', 2406774, 2429783, 16);
INSERT INTO States VALUES ('PA', 3051555, 3215969, 20);
-- Slightly simplified data
INSERT INTO States VALUES ('Red states', 0, 1, 232);
INSERT INTO States VALUES ('Blue states', 1, 0, 253);
```

Hint: Start by writing a query showing only the states Biden wins, along with a column containing the text value 'Biden'. You're more than half-way done!

Hint: Use the view to create the winner-query.

Exercise 1B: History 101

(Adapted from a previous exam question)

A database containing historical periods and historical events has the following schema:

Periods (pname, started, ended)

Events (ename, year)

Periods have a starting and ending year (both are inclusive) e.g. ('World war II', 1939, 1945) could be an entry. Events have a year when they occurred e.g. ('SQL became an ISO standard', 1987) could be an entry.

Write queries that solve these tasks:

a) Find the names of all events that occurred during any of the same historical periods as “The Great Collapsing Hrungr Disaster” (a fictional event that you may assume is in the Events table). Make sure each such event occurs only once in the result.

To clarify: “The Great Collapsing Hrungr Disaster” happened in some year, and that year is during some number of historical periods. Your job is to find all events that occurred during all those periods.

Hint: First write an query for finding all periods the event is in, and then use it to find all events in those periods.

b) Find the name of the most eventful historical period(s). In other words, the period with the greatest number of events in it. May be more than one period only if there are several periods with the same number of events.

Exercise 1C: Pricing

(Previous exam question)

Consider this schema for an online sales platform:

```
Items(itemname, price)
Categories(catname)
Categorized(item, category)
    category -> Categories.catname
    item    -> Items.itemname
Discounts(category, pricefactor)
    category -> Categories.catname
```

Items are things that can be sold. Each item has a base price. Some items belong to a category, and some categories have an active discount. The attribute pricefactor specifies a discount as a factor, e.g. a pricefactor of 0.75 means all items in the specified category are discounted by 25%.

Write an SQL query for solving each of these tasks:

- a) Find the name and actual price of each item, factoring in discounts where applicable.
- b) Find the largest difference in base price (ignoring discounts) between any two products in the same category. The result should be a single number. Items that have no category are irrelevant to this query.
- c) Find the average price of all products that do not have a category. The result should be a single number.