University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

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Group Number: 34

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

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Description/ Summary:

This project is a database about Canada's Parliament. This database will store information about our cabinet members, MPs, and senators and their voting records on specific bills, along with past election data. The system will be available for anyone so they can easily and quickly find information about what policies certain politicians have supported, and not supported in the past to make more informed decisions during elections so the people can ensure the politicians they vote for align with their personal values.

Change of Schema:

The change aims to simplify the ER diagram while maintaining the relationships between attributes.

Overall, we redesigned the schema after taking the feedback for milestone 2. We mainly amended the entities' attributes, removing redundant attributes viewed as burdens. We added a few more new entities and did a new normalization.

We identify the one-to-many relationships and group the entities together for new normalization. For instance, we group Senator, Recommend and PGmembership together (SenatorRecommendParliamentaryGroupMembership).

We do not implement non-election votes and bill-related entities.

*Below queries can be found in the appService.js on GitHub (milestone_4_cs304 folder -> appService.js)

-- 2.1.1 INSERT (appService.js line 110-122)

-- 2.1.2 Update (appService.js line 124-136)

Oracle database server does not support **ON UPDATE CASCADE**.

If allowed to implement **ON UPDATE CASCADE**, we would amend the **CandidatePartyMembership** table.

For instance,

CREATE TABLE CandidatePartyMembership (
        candidateName varchar2 (50) primary key,
        partyName varchar2 (50),
        sex char(1), --m/f/n
        foreign key (partyName) references PoliticalParty1 **ON UPDATE CASCADE**
);

In this case, we would update the party name and sex of the candidates in the **CandidatePartyMembership** table through **ON UPDATE CASCADE**.

-- 2.1.3 Delete (appService.js line 138-147)

-- 2.1.4 Selection (appService.js line 316-321)

-- 2.1.5 Projection (appService.js line 180)

-- 2.1.6 Join (appService.js line 187-198)

-- 2.1.7 Aggregation with GROUP BY (appService.js line 207-210)
-- Count the number of winning candidates grouped by party

SELECT M.partyName, COUNT(*) AS numWinners
FROM CandidatePartyMembership M
JOIN ElectionWin W ON M.candidateName = W.winner
GROUP BY M.partyName;

-- 2.1.8 Aggregation with HAVING (appService.js line 218-221)
-- Show the party that has official status (having 12 seats or above)

```
SELECT partyName
FROM PoliticalParty1
GROUP BY partyName
HAVING MAX(numSeatsInParliament) >= 12;
```

-- 2.1.9 Nested Aggregation with GROUP BY (appService.js line 229-235)
-- Calculates the difference in votes between the candidate with the most votes and the candidate with the fewest votes for each district and election year.

```
SELECT districtName, electionYear, MAX(VoteDifference) AS MaxVoteDifference
FROM (
    SELECT districtName, electionYear, MAX(VotesObtained) - MIN(VotesObtained) AS
VoteDifference
    FROM Elect
    GROUP BY districtName, electionYear
) AggregatedVotes
GROUP BY districtName, electionYear;
```

-- 2.1.10 Division (appService.js line 243-254)
-- Show the political parties having at least one candidate for all electoral districts in BC during the 2024 election.

```
SELECT partyName
FROM PoliticalParty1 P
WHERE NOT EXISTS (
  (SELECT districtName
   FROM ElectoralDistrict ED
   WHERE province = 'British Columbia')
  MINUS
  (SELECT D.districtName
   FROM Elect E
   JOIN CandidatePartyMembership CPM ON E.candidateName = CPM.candidateName
   JOIN ElectoralDistrict D ON E.districtName = D.districtName
   WHERE P.partyName = CPM.partyName)
);
```