# Prompt Start

I need you to be a programming Assistant that helps build databases.

# Context of the database.

Here is the context of the database I want to create enclosed in brackets.

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Introduction

The Australian Electoral Commission (AEC) is responsible for providing the Australian people with an independent electoral service which meets their needs and encourages them to understand and participate in the electoral process.

Australia counts votes manually during it’s elections. This federal election counting process delivers (1) integrity to the results, concentrating on (2) accuracy in a (3) highly transparent manner.

The issue is that it takes too long to count votes and the environmental impact. As a solution, a draft of a database that can count votes would be made.

Elections

For the scope of the project, this project will focus federal general elections for House of Representatives

Members of the House of Representatives are elected by the voters registered in each Electoral Division using full preferential voting. Each Electoral Division e**lects one member**.

Electoral Divisions

For the House of Representatives, each state and territory is divided into **electoral divisions** (or commonly known as **electorates or seats**).

Population determines the number of electoral division.

Election Process

When the sitting government is nearing its term (3 years) or under circumstances it is dissolved, the Australian Electoral Commission (AEC) calls for nominations of candidates.

* Registered political parties will then nominate their **candidates for one or more electoral divisions.**
* Most political parties nominate candidates for **many electoral divisions.**
* **Independent** candidates can nominate themselves for the election. (No party)
* Once the nomination process is over, AEC will determine the election date.
* On the election date, registered voters are required to attend a polling station and cast their vote on a ballot paper. This paper has tick boxes with the candidates on them. It also has the name of electoral division on the paper. This paper also has the party name each candidate belongs to.
* *For the scope of this project,* *pre-poll voting, postal voting, absentee voting, and declaration votes are not considered. We assume that regular process on the election day is done.*

Preferential Voting system.

Candidates for the house of representatives are elected using the preferential voting system.

* In this system, the voters are required to cast their order of preferences to ALL candidates contesting in their electoral division. (E.g. For the electoral division Higgins, Candidate James nominated 2, Candidate Mary nominated 1 etc.)
* At the end of the election day, after all the polling stations are closed, the counting begins.

Step 1:

Step 1: Count of first preferences (primary vote)

In this step, all of the number “1” votes are counted for each candidate.

* If a candidate gets more than half the total first preference votes, that candidate will be elected.

Step 2: Distribution of preferences

If no candidate has more than half of the votes, the candidate with the fewest votes is excluded.

* This candidate’s votes are transferred to the candidates according to the second preferences of the voters on the ballot papers for the excluded candidate.
* If still no candidate has more than half the votes, the second-last candidate who now has the fewest votes are excluded and the votes are transferred according to the next preference on the ballot papers
* This process is continued until one candidate has more than half the total number of valid votes.
* E.g., First Count: Candidate 1 4000 votes, Candidate 2 4000 votes , Candidate 3 3611 votes. Candidate 3 has the least votes so they are excluded and their votes (3611) are distributed based on their second preference. Second Count: Candidate 1 7000 votes, Candidate 2 4611 votes. Since Candidate 2 has the least votes, they are excluded. Candidate 1 wins.

Components of proposed system

1. Computerised Electoral Role

The system will maintain a computerised electoral role, i.e. a database of registered voters for each electoral division. For each registered voter, following information is stored:

• Title

• First name\*

• Middle names (if any)

• Last name\*

• Gender

• Date of Birth\*

• Residential Address\* (Unit number, street number, street name, suburb, postcode, state) • (no letter box addresses accepted)

• Postal Address (as above, or can be different)

• Contact Details (daytime phone number, mobile phone number, email address)

• Electoral Division (determined by the system based on residential address) There are around 17,259,000 Australians are currently enrolled to vote (https://www.aec.gov.au/Enrolling\_to\_vote/Enrolment\_stats/index.htm).

2. Details of Elections

The following details about elections are required to be stored in the database.

• Election Serial Number (a unique code generated and stored by the system)

• Date of the election

• Type of election (house of representative, senate, by-election, etc)

• Total number of electoral divisions

• Total number of registered voters (the number of registered voters at the closing of the electoral role registrations for the corresponding election)

3. Details of Electoral Divisions

The following details about electoral divisions are required to be stored in the database.

• Electoral Division Name

• Total number of currently registered voters

• Historical record of registered voters (the historical data are captured at closing date of the electoral role registrations for the past elections. Both the date and no. of voters are stored)

• Name and party of the current member of parliament

4. Details of Political Parties

The following details about political parties are required to be stored in the database.

• Party Code

• Name of the party

• Party Logo

• Postal address of the party headquarters

• Secretary of the party

• Contact Person (name and other contact details such as daytime phone number, mobile, and email)

5. Details of Candidates

The following details about political parties are required to be stored in the database.

• Name

• Political Party Code (or IND, if they are independent)

• Contact Details name and other contact details such as daytime phone number, mobile, and email)

• Election Code

• Electoral Division Contesting

6. Computerised Ballot papers cast

The computerised ballot paper captures and stores voters’ preferences (similar to what’s written on a paper-based ballot paper. [Very important] To ensure integrity and confidentiality of the voting process, once a voter is issued a computerised ballot paper, there should not have any identification records to positively identify who cast that vote. As such, only the following data are stored with each computerised ballot paper.

• Election Code

• Electoral Division

• Preferences cast (i.e which candidate got the first preference, who got the second preference, etc)

However, there must be a mechanism in place to record the issuance of a ballot paper to a voter. The issuance record must capture the following information:

• Election code

• Electoral Division

• Polling Station Name

• Identifying details of the voter – these data should be sufficient to uniquely refer to a voter in the electoral role

• Timestamp

7. Election results

At the end of counting process, for each electoral division, the following result data are stored.

• Election Code

• Electoral Division

• Primary vote for each candidate (i.e. first preferences)

• Preferential vote count for each candidate, at the each iteration of elimination process (refer to page 32 of https://www.aec.gov.au/about\_aec/Publications/electoral\_pocketbook/2019/2019 electoral-pocketbook.pdf)

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# Task build a new database

You are required to build the data model for this application using an Entity-Relationship Diagram. You must use UML notation for your ER diagram

* Have a summarised explanation of each entity and it’s attributes. Make the explanation easy to understand for someone who has never touched databases.
* List the relationships between tables (1..1, 0.1, 1..\*, etc.). If there is a many to many between 2 tables, ensure an association table is made.
* Make sure that the voter table and ballot issuance table link. That way the database can confirm if a voter has voted but it does not record their private details.
* In the final table (electionResults) ensure that primary votes and preference distribution. They must count based on the ballot papers. Primary vote should have candidate details, the primary vote and information of which electorate they got first preference. The distribution of preferences should have the round number (1,2,3,4,5) of preferential counting per candidate, the electoral division id, candidate id and the number of votes per preferential voting round.
* Don’t forget about the election results table. The primary vote and preference distribution must carry over to this table.
* Do not make a table the counts the eliminated candidates.

# Check my current database.