**DBMS LAB PROJECT** **MOVENTUR:**

**NORMALIZED RELATIONAL**

**SCHEMA**

**KEY MILESTONE # 0****2**

**Spring 2025**

**CSE-403L**

**Database Management System Lab**

Submitted by:

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Class Section: **‘C’**

“We affirm that we have completed this work with integrity”

Submitted to:

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May 28, 2025

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**Project :Voting and Election Management System**

**Converted Relational Schema (from Conceptual Schema):**

1. Voter: Voter( VoterID PK, Name )
2. Election: Election( ElectionID PK, ElectionType )
3. Candidate: Candidate( CandidateID PK, Name, Party, ElectionID FK )
4. Vote: Vote( VoteID PK, VoterID FK, CandidateID FK, ElectionID FK, PollingStationID FK )
5. PollingStation: PollingStation( PollingStationID PK, Location )

**Stepwise Normalization To 3NF:**

1. Voter: Unnormalized: Voter(VoterID, Name)

1NF:

* All attributes are atomic (Name is a single string).
* Already in 1NF.

2NF:

* VoterID is the primary key.
* No partial dependencies exist, as the primary key is a single column.

3NF:

* No transitive dependencies. Name depends directly on VoterID. Final Normalized Form: Voter(VoterID PK, Name)

1. Election: Unnormalized: Election(ElectionID, ElectionType)

1NF:

* All attributes are atomic (ElectionType is a single string).
* Already in 1NF.

2NF:

* ElectionID is the primary key.
* No partial dependencies exist.

3NF:

* No transitive dependencies. ElectionType depends directly on ElectionID. Final Normalized Form: Election(ElectionID PK, ElectionType)

1. Candidate: Unnormalized: Candidate(CandidateID, Name, Party, ElectionID)

1NF:

* All attributes are atomic.
* Already in 1NF.

2NF:

* CandidateID is the primary key.
* No partial dependencies exist.

3NF:

* No transitive dependencies. ElectionID is a foreign key but depends directly on CandidateID. Final Normalized Form: Candidate(CandidateID PK, Name, Party, ElectionID FK)

1. Vote: Unnormalized: Vote(VoteID, VoterID, CandidateID, ElectionID, PollingStationID)

1NF:

* All attributes are atomic.
* Already in 1NF.

2NF:

* VoteID is the primary key.
* No partial dependencies exist.

3NF:

* No transitive dependencies. VoterID, CandidateID, ElectionID, and PollingStationID are foreign keys but depend directly on VoteID.
* Note: A unique constraint on (VoterID, ElectionID) is required to enforce the business rule that a voter submits zero or one vote per election. Final Normalized Form: Vote(VoteID PK, VoterID FK, CandidateID FK, ElectionID FK, PollingStationID FK)

1. PollingStation: Unnormalized: PollingStation(PollingStationID, Location)

1NF:

* All attributes are atomic (Location is a single string).
* Already in 1NF.

2NF:

* PollingStationID is the primary key.
* No partial dependencies exist.

3NF:

* No transitive dependencies. Location depends directly on PollingStationID. Final Normalized Form: PollingStation(PollingStationID PK, Location)