Validation based protocol

- Validation based protocol in DBMS is a type of concurrency control techniques that works on the validation rules and time-stamps. It is also known as the optimistic concurrency control technique.

- The protocol associated with three phases for managing concurrent transactions

1. read phase
2. validation phase
3. write phase.

- **How Validation Based Protocol works in DBMS**

- **Read and Execution Phase**: Read phases involve read and execute an operation for Transaction T1. The values of the multiple data items are being read in this phase and the protocol writes the data in a temporary variable. The temporary variable is a local variable that holds the data item instead of writing it to the database.

- **Validation Phase:** The validation phase is an important phase of the concurrency protocol. It involves validating the temporary value with the actual values in the database and to check the view serializability condition.

- **Write Phase:** The write phase ensures valid data to be written to the database that is validated in the validation phase. The protocol performs the rollback operation in case of an invalid scenario of the validation phase.

Timestamps associated with each phase

- **Start(Timestamp)**: The start timestamp is the initial timestamp when the data item being read and executed in the read phase of the validation protocol.
- **Validation(Timestamp):** The validation timestamp is the timestamp when T1 completed the read phase and started with the validation phase.
- **Finish(Timestamp):** The finish timestamp is the timestamp when T1 completes the writing process in the writing phase.

- To manage the concurrency between transactions T1 and T2, the validation test process for T1 should validate all the T1 operations should follow TS(T1) < TS(T2) where TS is the timestamp and one of the following condition should be satisfying.

Finish T1 < Start T2

- In this condition, T1 completes all the execution processes before the T2 starts the operations.
- It regulates maintaining the serializability.

- **Start(T2) <Finish(T1) <Validate(T2)**
- The validation phase of T2 should occur after the finish phase of T1. This scenario is useful for concurrent transaction serializability.
- The Transactions are able to access the mutually exclusive database resource at a particular timestamp while validating the protocol conditions.

- The validation based protocol relies on the timestamp to achieve serializability. The validation phase is the deciding phase for the transaction to be committed or rollback in the database. It works on the equation TS (T1) =Validation (T1) where TS is the time stamp and T1 is the transaction.