**Assignment 6: Draft a brief report on the use of transaction logs for data recovery and create a hypothetical scenario where a transaction log is instrumental in data recovery after an unexpected shutdown**

**Report on Transaction Logs:**

Transaction logs are essential components of database management systems for ensuring data integrity and facilitating recovery in case of system failures or unexpected shutdowns. These logs record all modifications made to the database, including INSERTs, UPDATEs, DELETEs, and COMMITs, in chronological order.

In the event of an unexpected shutdown, the transaction log can be instrumental in recovering data to a consistent state. Let's consider a hypothetical scenario:

**Scenario:**

A company operates an e-commerce platform where customers place orders for various products. During peak hours, the database server unexpectedly shuts down due to a power outage. Prior to the shutdown, several transactions were in progress, including order placements and updates to product information.

**Data Recovery Process : Identifying Incomplete Transactions:** Upon restart, the database management system examines the transaction log to identify incomplete transactions at the time of the shutdown.

**Rolling Back Incomplete Transactions:** The system uses the transaction log to roll back incomplete transactions to their last consistent state before the shutdown, ensuring data integrity.

**Reapplying Committed Transactions:** Transactions that were successfully committed before the shutdown are reapplied using the transaction log, restoring the database to its latest consistent state.

**Consistency Verification:** Once the recovery process is complete, the database management system performs consistency checks to ensure that the recovered data is valid and consistent.

**Conclusion**:Transaction logs play a crucial role in data recovery by preserving a record of all database modifications. In the event of a system failure, these logs enable the database management system to recover transactions and restore the database to a consistent state, minimizing data loss and ensuring business continuity.