UNIT 5

Database Administration

Marks- 10

Syllabus Details

Unit - V Database Administration

5.1 Introduction to database administration:- Types of database users, Create and delete users, Assign privileges to users

5.2 Transaction: Concept, Properties & States of Transaction

5.3 Database Backup: Types of Failures, Causes of Failure,
Database backup introduction, types of database backups :Physical & Logical

5.4 Data Recovery – Recovery concepts , recovery techniques- roll forward ,Rollback

5.5 Overview of Advanced database concepts:- Data Warehouse ,Data lakes , Data mining, Big data ,Mongo DB ,DynamoDB,

Introduction to Database Security

Database security concerns the use of a broad range of information **security controls** to **protect databases** against compromises of their **confidentiality, integrity and availability.**

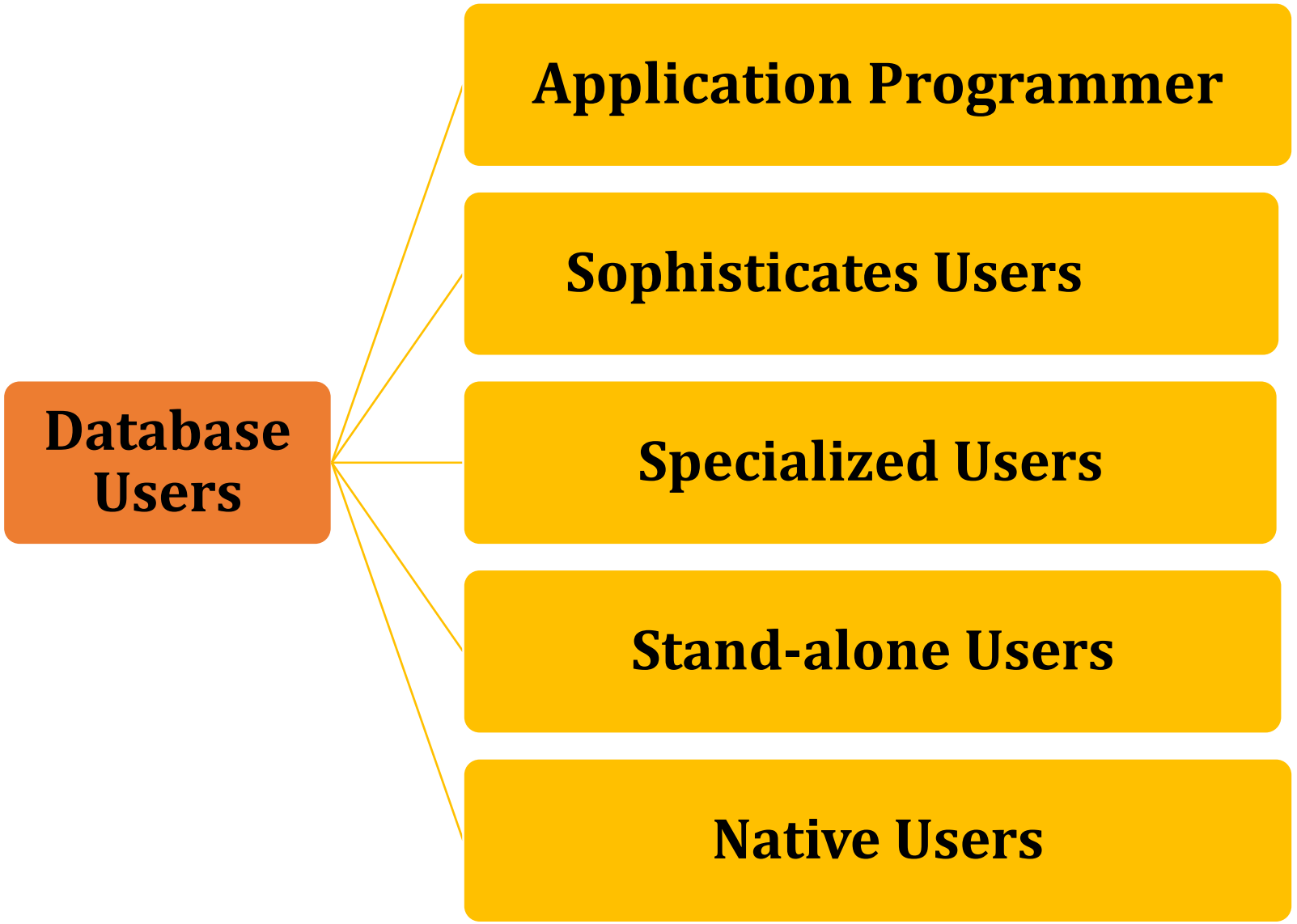
- ✓The data
- ✓The database applications or functions,
- ✓The database systems,
- ✓The database serves
- ✓The associated network links

It involves various types or categories of controls, such as technical, procedural/administrative and physical.

Data Security Requirements

- Unauthorized access
- Misuse
- Hackers
- Malware infection
- Overloads,Performance
- Physical Damage
- Design flaws, Programming Bugs, Data loss
- Data corruption
- Network Security
- Access Control

Types of Database Users



Creating , Altering & Deleting User

- **Creating user**

  create user username identified by password

  create user dms identified by sairam;

- **Altering user**

  alter user username identified by password

  alter user dms identified by sairam123;

- **Deleting user**

  drop user username[cascade]

  drop user dms cascade;

Database Privileges

Privileges define the access rights to database users on database objects .
They also define rights to run a SQL statement, or PLSQL package.

- ✓ALL PRIVILEGES
- ✓CREATE
- ✓DROP
- ✓DELETE
- ✓INSERT
- ✓SELECT
- ✓UPDATE
- ✓GRANT
- ✓REVOKE

System Privileges

It allows a user to perform administrative action in a database.

- ✓ **Create database**
- ✓ **Create procedure**
- ✓ **Create view**
- ✓ **Backup database**
- ✓ **Create table**
- ✓ **Create trigger**
- ✓ **Execute**

Objective Privileges

Object privileges allow for the use of certain operations database objects as authorized by another user.

Therefore the database objects can only be used by
1. The owner of the project
2. The owner of the schema in which the object is located
3. Users to whom the owner of the object has granted privileges
4. Users to whom of the parent schema has granted privileges

Grant & Revoke Privileges

Granting Privileges to User

grant select,insert,update,delete on tablename to username;

grant select,insert,update,delete on students to dcp;

Revoke privileges from User

revoke select,insert,update,delete on tablename from username;

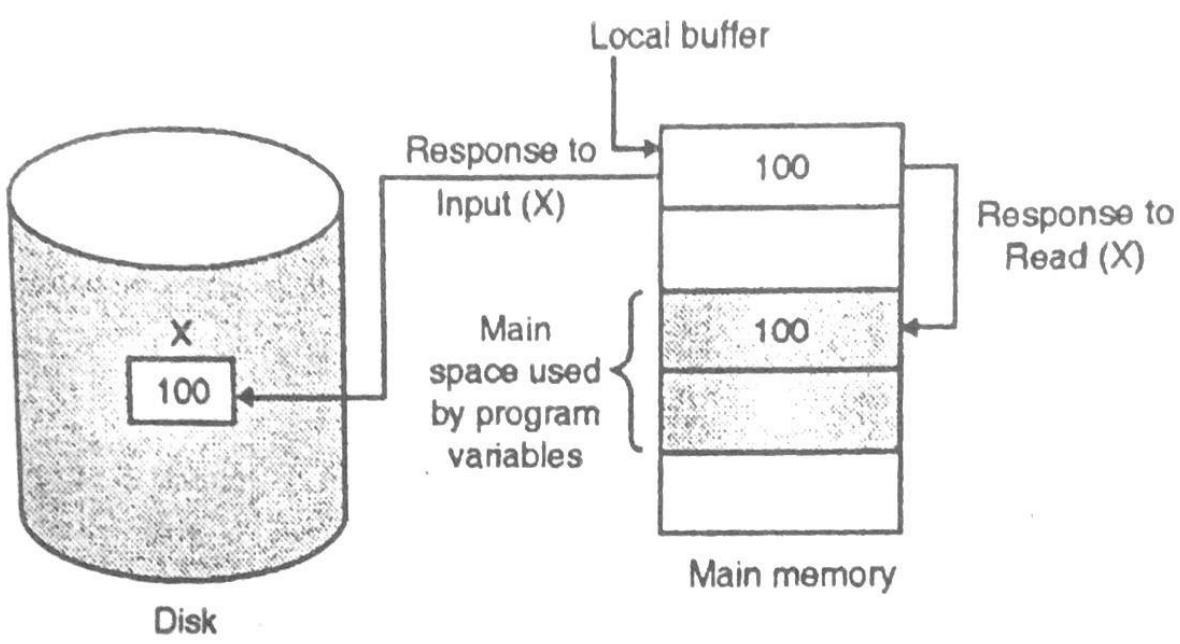
revoke select,insert,update,delete on students from dcp;

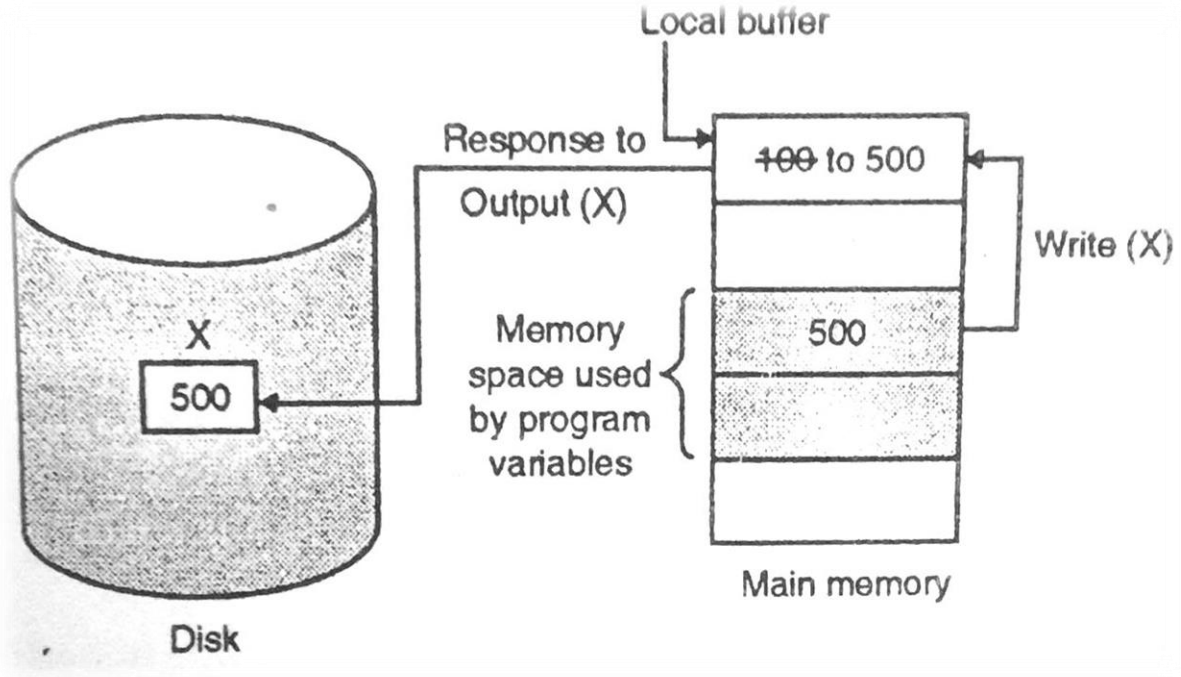
Granting ALL Privileges to User

Grant all Privileges on *.* to username

Transaction

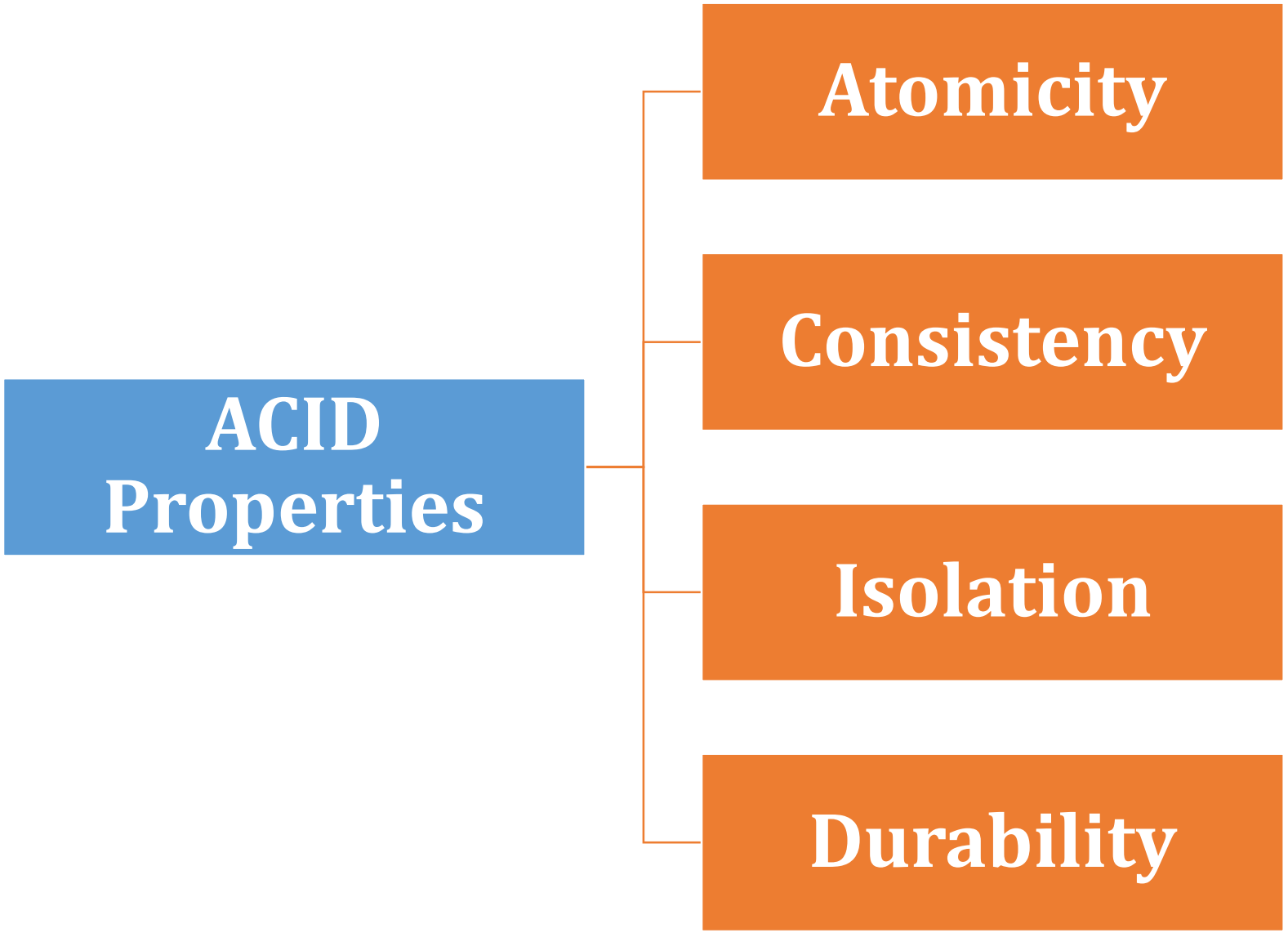
A transaction is a **series of operations** performed as a **single logical unit of work** on the Database Management System. Transaction leads to **modification** in the database contents.



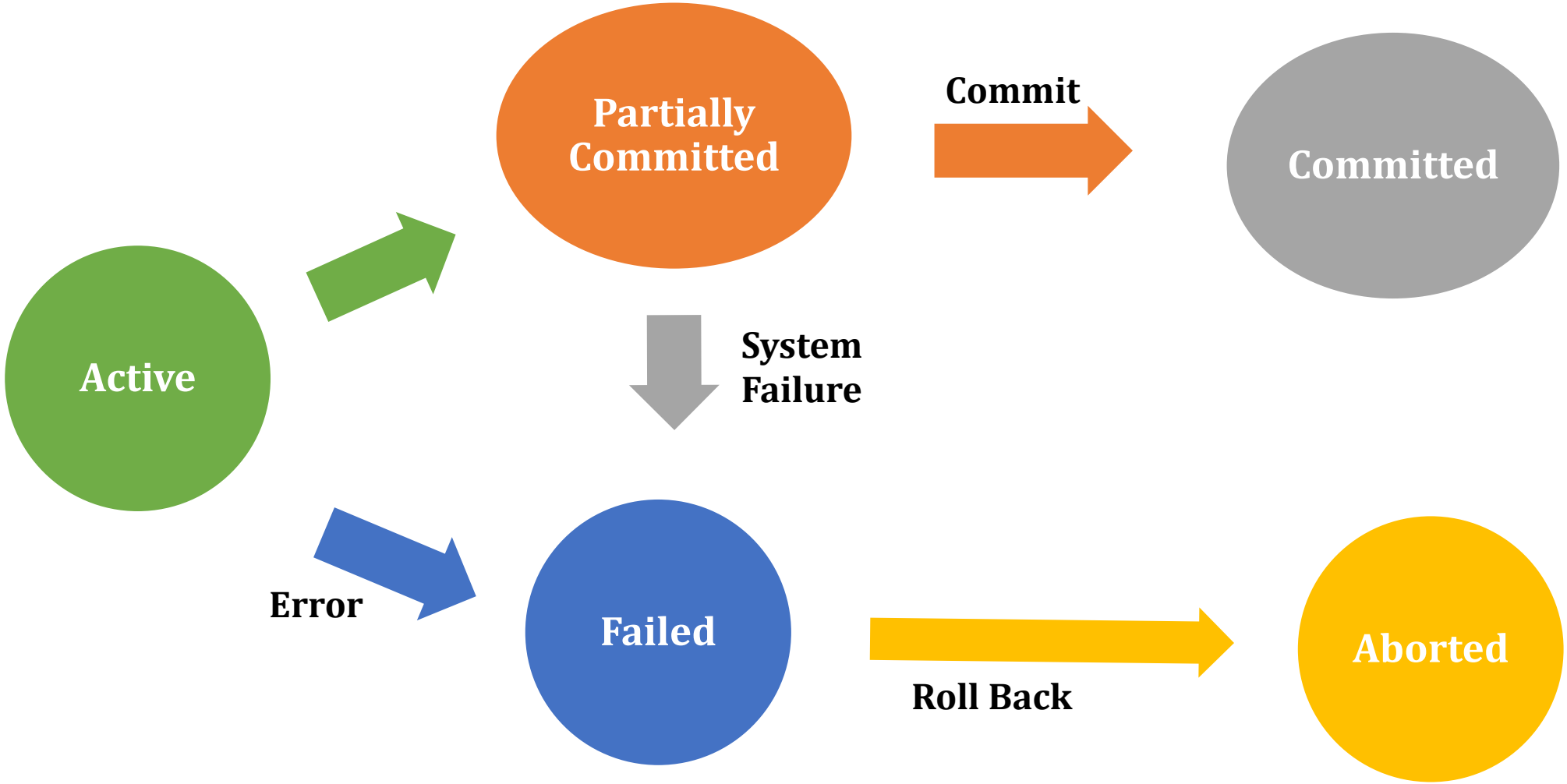


Read(x); **Input(x);** **Write(x);** **Output(x);**

Properties of Transaction



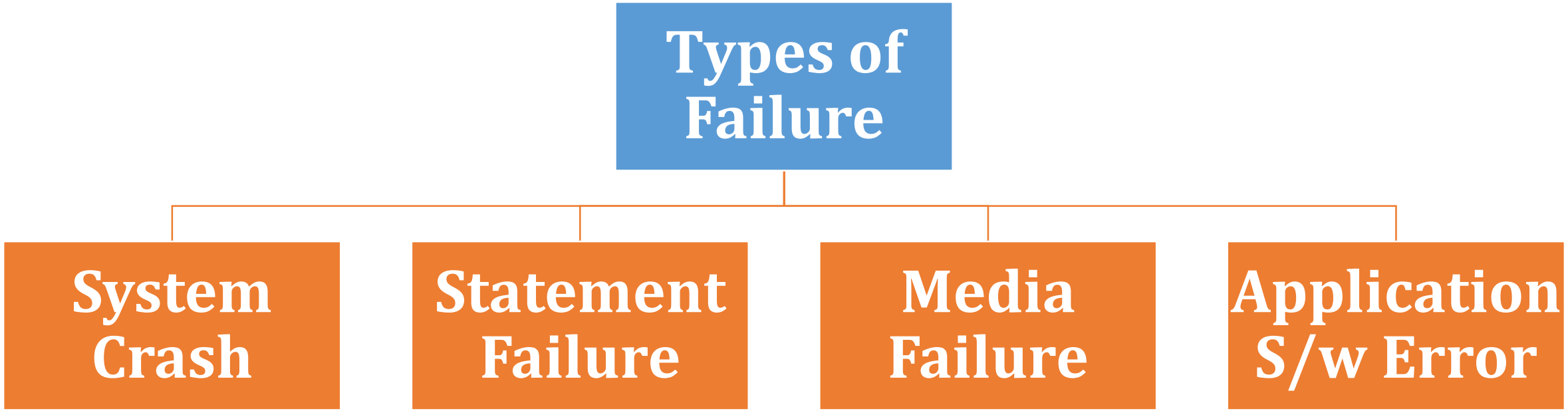
Transaction States



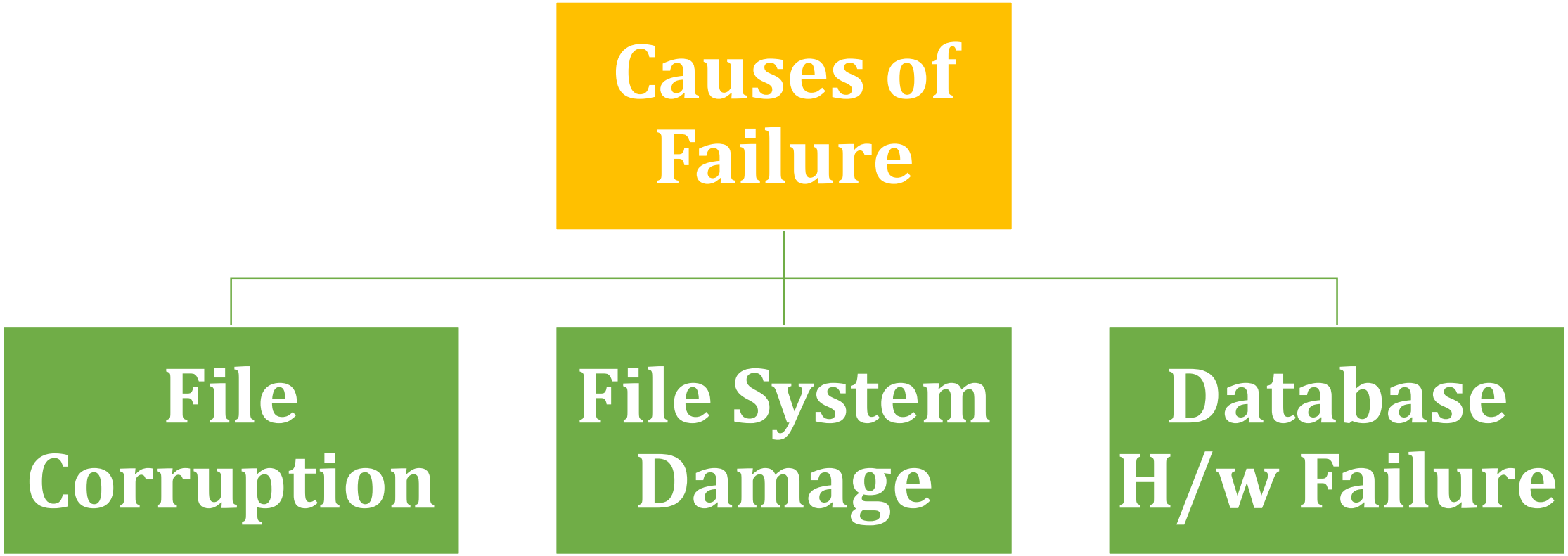
Database Backup

- Database Backup is storage of data that means the copy of the data.
- It is a safeguard against unexpected data loss and application errors.
- It protects the database against data loss.
- If the original data is lost, then using the backup it can reconstruct.

Types of Failure



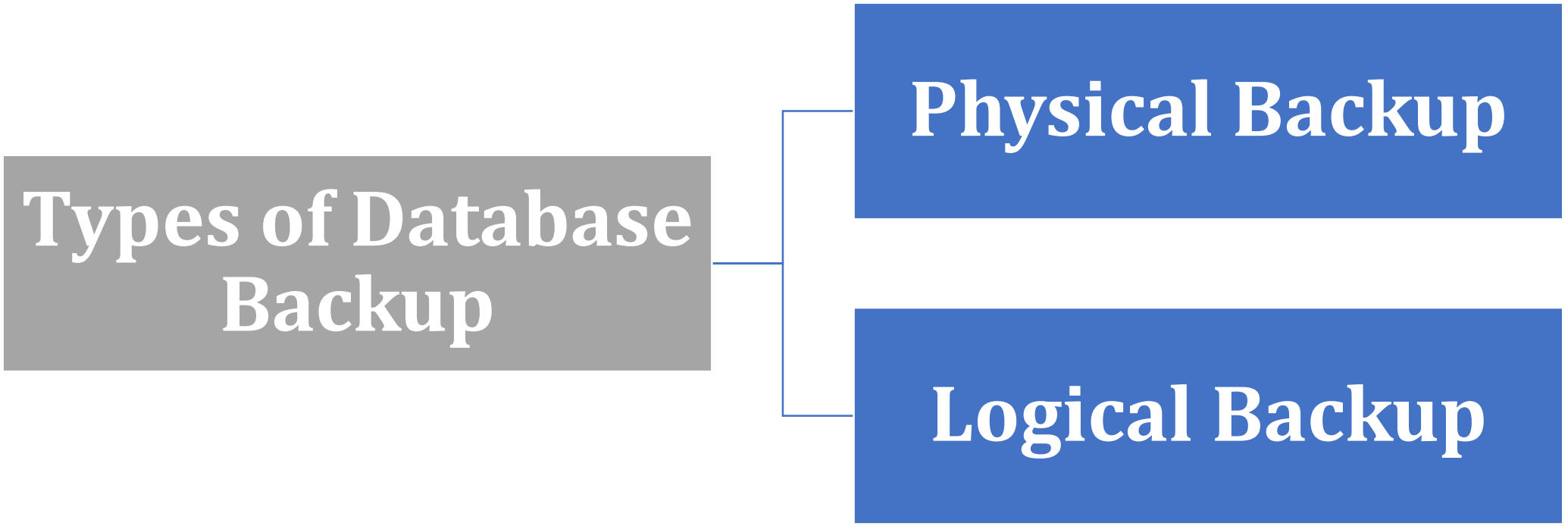
Causes of Failure



Database Backup

- Database Backup is storage of data that means the copy of the data.
- It is a safeguard against unexpected data loss and application errors.
- It protects the database against data loss.
- If the original data is lost, then using the backup it can reconstruct.

Types of Database Backup



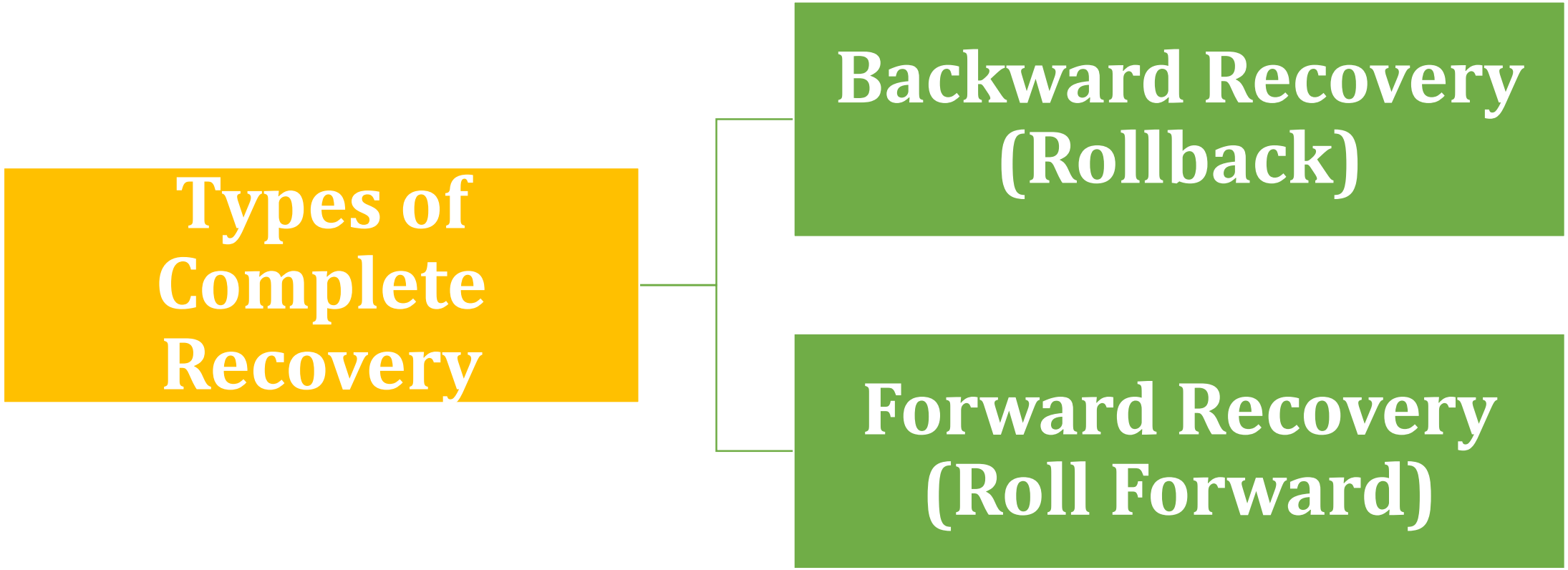
Database Recovery

- Database can fail due to some reasons like media failure, operating system failure, accidental damage, and intentional damage to the database.

- When database stops working due to any above reasons, it's the responsibility of Database Administrator to recover the database using its backup files and restoration of database into the state it was in, before its failure.

- There are two major types of complete recovery the database.

Recovery Techniques



Important Questions

4 marks Question

1. Explain ACID properties of traction.
2. Describe database backups with it's types.
3. Explain state of transaction with the help of diagram.
4. State the concept of database recovery.
5. State types of database user.
6. Explain recovery techniques with example
7. Explain the four roles of database administrator.
8. Describe commit and rollback with syntax and example.
9. Explain database security with it's requirements in detail.
10. Create user 'RAM'.ii) Grant create, select, insert, update, delete privileges to user 'RAM'.iii) Remove update privilege from user 'RAM'.

Important Questions

6 Marks Question

1.Describe database privileges. Write down the procedure for granting & revoking privileges in database objects to the users.

2.Write SQL command for following :

a)Create user

b)Grant privileges to user

c)Remove privileges from user

3.

i) Create user ‘Rahul’

ii) Grant create, select, insert, update, delete, drop privilege to ‘Rahul’.

iii) Removes the select privilege from user ‘Rahul’.