backup

backup types	Full Backup	Differential Backup	Transaction Log Backup	Copy-Only Backup	File/Filegroup Backup
When it is used	As the foundational backup, it is typically performed periodically (e.g., weekly) to capture the entire database	After a full backup, differential backups capture changes made since the last full backup. They are performed more frequently than full backups	In databases using the full or bulk-logged recovery model, transaction log backups are taken frequently to capture all transaction logs.	For special purposes, such as creating a backup for testing or copying a production database to a development environment, without affecting the regular backup chain.	In large databases, when only specific parts (files or filegroups) need to be backed up, rather than the entire database
What it includes	The entire database, including all data, objects, and transaction logs up to the point of the backup.	All changes made since the last full backup	All transaction logs since the last transaction log backup	A full backup that does not reset the differential base	Specific database files or filegroups selected for backup.
Pros &	• Simplifies restore processes since only the full backup is needed. • Provides a complete snapshot of the database.	• Faster than full backups since only changes are captured. • Simplifies restoration by requiring only the last full and differential backups	• Allows for point-in-time recovery, minimizing data loss. • Efficient in capturing small, incremental changes.Handy Backup+5	• Does not interfere with the regular backup schedule. • Useful for creating isolated backups for specific tasks.	• Reduces backup time and storage requirements by targeting specific data. • Allows for more granular recovery options.
cons	• Can be time-consuming and resource-intensive, especially for large databases. • Requires significant storage space	• As time progresses, differential backups can become large, requiring more storage. • Restoration might take longer if the differential backup is large.	• Requires careful management to prevent transaction log files from growing excessively. • Restoration can be complex, requiring a sequence of backups	• Cannot serve as a base for differential backups. • Not suitable for regular backup strategies	• More complex to manage and restore, requiring careful planning. • Not suitable for all types of data or applications.
Real-world scenario	In a banking system, a full backup is essential to ensure that all customer data, transactions, and account information are securely stored and can be restored in case of a disaster.	In an e-learning platform, differential backups can be scheduled daily to capture new course content, user progress, and interactions, ensuring that recent changes are preserved without the overhead of full backups.	In a ticketing system, transaction log backups ensure that every ticket purchase, cancellation, and modification is recorded, allowing for precise recovery in case of system failure	In a banking system, a copy-only backup might be created before a major system upgrade to ensure that a stable backup is available for rollback purposes without disrupting the ongoing backup schedule.	In an e-learning platform, different filegroups might store course content, user data, and analytics. Backing up only the user data filegroup allows for efficient backups without impacting the entire system