CC105

Information Management

Storage Engines for MySQL

SQL database storage engines determine how data is stored, indexed, and retrieved within a database.

Different engines offer various features like transaction support, foreign key constraints, performance optimizations, and indexing strategies.

InnoDB (Default Engine in MySQL)

InnoDB

Supports Transactions (ACID-compliant)

InnoDB

Supports Foreign Keys (Enforces ON DELETE RESTRICT, ON DELETE CASCADE, etc.)

InnoDB

Row-Level Locking (Better performance in concurrent environments)

InnoDB

Crash Recovery (Uses logs to restore data in case of failure)

InnoDB

When to Use? If you need data integrity, transactions, and foreign key constraints.

```
CREATE TABLE Students (
    StudentID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50)
) ENGINE=InnoDB;
```

MyISAM (Older Engine)

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Faster Reads (Good for read-heavy applications)

MyISAM (Older Engine)

When to Use? If you need fast reads and don’t require transactions or foreign keys.

```
CREATE TABLE Students (
    StudentID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50)
) ENGINE=MyISAM;
```

For most modern applications, **InnoDB** is the best choice in MySQL because it supports transactions, foreign keys, and crash recovery.

ON DELETE RESTRICT (Default)

ON DELETE
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Prevents deletion of a referenced record if there are child records.

ON DELETE
RESTRICT (Default)

Error occurs if you attempt to delete a referenced record.

ON DELETE
RESTRICT (Default)

Ensures data integrity by not allowing orphaned rows.

ON DELETE CASCADE

ON DELETE CASCADE

Automatically deletes child records when the parent record is deleted.

ON DELETE CASCADE

Prevents orphaned records by removing dependent data.

ON DELETE SET NULL

ON DELETE SET NULL

Sets foreign key column to NULL instead of deleting the child row.

ON DELETE SET NULL

Used when you want to keep related data but remove its dependency.

ON DELETE NO ACTION (Same as RESTRICT)

ON DELETE NO ACTION (Same as RESTRICT)

Does nothing if there are dependent records.

ON DELETE NO ACTION
(Same as RESTRICT)

Default behavior in most databases.

ON DELETE NO ACTION (Same as RESTRICT)

If no ON DELETE is specified, this is assumed.

ON DELETE Option	Behavior
RESTRICT (or NO ACTION)	Prevents deletion if referenced. (Default)
CASCADE	Deletes child records automatically.
SET NULL	Sets foreign key column to NULL.
NO ACTION	Same as RESTRICT (default behavior).

Activity

Instructions: Create the tables based on the statement. Use InnoDB as your storage engine. Write in a ½ sheet of paper.

Statement: A teacher can teach multiple classes, and a class can be taught by multiple teachers.

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