IT Department

Cascades, Views and Conditional Statements

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Outline

- What are **Cascades**?
  - **UPDATE** Cascade
  - **DELETE** Cascade
- What is **View**?
- Conditions in MySQL Query
  - **IF** Statement**, CASE** Statement
  - **IF( )** Function

What are Cascades?

- **Cascading changes** are used to ensure **referential integrity** between related tables.
- **Referential integrity** refers to the fact that all references in a database are valid.
- **Example:** There is a referential integrity between **Department** and **Student** tables, as **deptName** in **Student** table is a foreign key references to **deptName** in **Department** table. Cascading changes means that if change happens on **Department** table (the parent table), the change automatically applies on the **Student** table (the child table). So, for example, if we delete row related to IT department from the **Department** table, automatically all rows related to IT department in the **Student** table will be deleted.

Department

deptName	deptCode	budget
Accounting	AC09	5000
IT	IT10	6000

Student

stuId	stuName	deptName	Address
1022	Jane	Accounting	Erbil
1023	Jack	IT	Akre
1024	Kate	IT	Erbil

What are Cascades?

- The **CASCADE** option automatically deletes or updates matching rows in the **child table** when deleting or updating rows in the **parent table**.
- Types of Cascading Changes:
  - Cascading **Delete** (ON DELETE CASCADE)
  - Cascading **Update** (ON UPDATE CASCADE)
- **Update and Delete cascades** can be created in **CRETAE TABLE** or **ALTER TABLE** statements.

UPDATE and DELETE Cascades

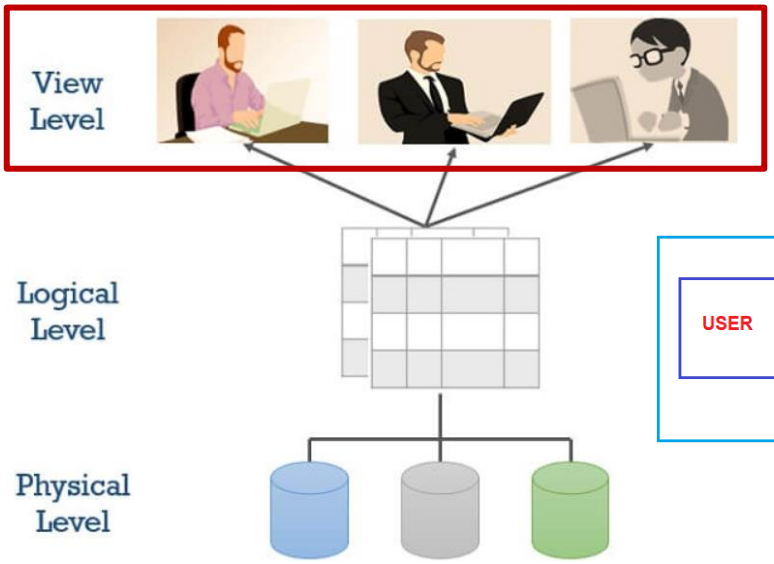
```
Create Table Department
(    deptName   varchar(100),
     deptCode   varchar(6),
     Budget     int,
     primary key (deptName)
);
```

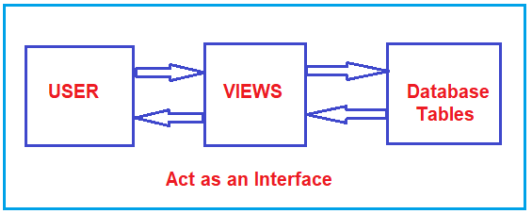
```
Create Table Student
(    stuID      int   auto_increment,
     stuName    varchar(80),
     deptName   varchar(100),
     Address    varchar(50),
     primary key (stuID),
     foreign key (deptName) references Department (deptName)
          ON UPDATE CASCADE
          ON DELETE CASCADE
);
```

What is View?

- **View** is a virtual table that does not physically exist.
- **View** can be executed when it is called.
- A **view** contains a part of rows and columns from one or more real tables in the database.
- **Why Do We Need View?**
  - There are situations in which you don't want that some users see all data in a table.
  - **Solution:** Specify part of table that user is allowed to see and define it as a view.

View in Database





An Example of View

- Consider in the **university database**, staff and students can ONLY see the ID, name and department name of instructors, **NOT their salary**.

```
SELECT  ID, name, deptName
FROM    instructor;
```

ID	Name	deptName	Salary
1	Peter	Biology	2000
2	Sara	Dentistry	4000
3	Kim	Biology	1500

- By creating a view, we can hide certain data from the view of certain users.
- The query above is only an example of specifying part of the table that the user is allowed to see. In the next slide, you will learn how to create a view by using a query.

Syntax of Creating View in MySQL

```
CREATE VIEW view_name AS
    SELECT column_name(s)
    FROM table_name(s)
    WHERE condition(s);
```

- How to see the data in the view?

```
SELECT * FROM view_name;
```

Example of Creating View

- Create a view to find **all information** of products that their price is greater than $1000.

```
create view highprice as
select *
from product
where price>1000;
```

```
select * from highprice;
```

product

PID	PName	Price
12	Laptop	2000
13	Printer	1100
14	HDD	300

highprice

PID	PName	Price
12	Laptop	2000
13	Printer	1100

Conditional Statements in MySQL

```
IF … THEN  Statement
```

```
IF … THEN … ELSE  Statement
```

```
IF … THEN … ELSEIF … THEN … ELSE  Statement
```

```
CASE
    WHEN  condition1  THEN  result1
    WHEN  condition2  THEN  result2
     ELSE  result
END;
```

Conditional Functions in MySQL

- The **IF( )** function returns a value if a condition is **TRUE**, or another value if a condition is **FALSE**.
- Syntax of **IF( )** Function in **MySQL**:

IF (***condition*** , **value_if_true** , **value_if_false**)

Example of Using IF( ) Function

- By having Faculty table, write a query to show output according to the given conditions:

High Salary: Salary > 3000

Low Salary: Salary <= 3000

Faculty

facID	facName	deptName	rank	salary
BI01	Adams	Biology	Lecturer	$3,000.00
CS01	Byrne	IT	Assistant Prof	$2,000.00
CS02	Smith	IT	Assistant Lec	$1,400.00
CS03	John	IT	Lecturer	$1,800.00
EN01	Smith	English	Professor	$5,000.00
EN02	Leonardo	English	Assistant Lec	$1,500.00
EN03	Kate	English	Lecturer	$1,700.00
HI01	Kim	History	Assistant Prof	$2,500.00
MA01	Julia	Mathematics	Assistant Lec	$1,100.00
SP01	Maria	Sport	Professor	$4,000.00
SP02	Sarah	Sport	Lecturer	$2,000.00

Example of Using IF( ) Function

- By having **Faculty** table, write a query to show output according to the given conditions:

High Salary: Salary > 3000

Low Salary: Salary <= 3000

Faculty

facID	facName	deptName	rank	salary
BI01	Adams	Biology	Lecturer	$3,000.00
CS01	Byrne	IT	Assistant Prof	$2,000.00
MA01	Julia	Mathematics	Assistant Lec	$1,100.00
SP01	Maria	Sport	Professor	$4,000.00

```
SELECT facName, salary, if (salary>3000, 'High Salary', 'Low Salary' ) AS salaryStatus
FROM Faculty;
```

SQL Output

facName	salary	salaryStatus
Adams	$3,000.00	Low Salary
Byrne	$2,000.00	Low Salary
Julia	$1,100.00	Low Salary
Maria	$4,000.00	High Salary

Conditional Functions in MySQL

- By having **Faculty** table, write a query to show output according to the given conditions:

High Salary: Salary > 3000

Medium Salary: Salary > 2000 and < = 3000

Low Salary: Salary >= 0 and <= 2000

Wrong Amount: Salary < 0

Faculty

facID	facName	deptName	rank	salary
BI01	Adams	Biology	Lecturer	$3,000.00
CS01	Byrne	IT	Assistant Prof	$2,000.00
MA01	Julia	Mathematics	Assistant Lec	$1,100.00
SP01	Maria	Sport	Professor	$4,000.00

In this example, there are multiple conditions. We can use **IF( )** function, but there is an even better solution for this example, using a CASE statement.

CASE Statement

- The **CASE** statement goes through conditions and returns a value when the first condition is met.
- It acts like the **IF-THEN-ELSE** statement.
- Once a condition is **true**, it will stop reading and return the result.
- If none of the conditions are **true**, it returns the value in the **ELSE** clause.
- If there is no **ELSE** part and none of the conditions are **true**, it returns **NULL**.

CASE Statement Syntax in MySQL

```
CASE
    WHEN condition1 THEN result1
    WHEN condition2 THEN result2
    ...
    WHEN conditionN THEN resultN
    ELSE result
END;
```

Example – CASE Statement in MySQL

- By having Faculty table, write a query to show output according to the given conditions, using **CASE** statement.

High Salary: Salary > 3000

Medium Salary: Salary > 2000 and < = 3000

Low Salary: Salary >= 0 and <= 2000

Wrong Amount: Salary < 0

Faculty

facID	facName	deptName	rank	salary
BI01	Adams	Biology	Lecturer	$3,000.00
CS01	Byrne	IT	Assistant Prof	$2,000.00
MA01	Julia	Mathematics	Assistant Lec	$1,100.00
SP01	Maria	Sport	Professor	$4,000.00

Example – CASE Statement in MySQL

- By having **Faculty** table, write a query to show output according to the given conditions, using **CASE** statement.

High Salary: Salary > 3000

Medium Salary: Salary > 2000 and < = 3000

Low Salary: Salary >= 0 and <= 2000

Wrong Amount: Salary < 0

```
SELECT facName, salary,
    CASE
        WHEN salary>3000 THEN 'High Salary'
        WHEN salary>2000 AND salary<=3000 THEN 'Medium Salary'
        WHEN salary>=0 AND salary<=2000 THEN 'Low Salary'
        ELSE 'Wrong Amount'
    END AS salaryStatus
FROM Faculty;
```

Faculty

facID	facName	deptName	rank	salary
BI01	Adams	Biology	Lecturer	$3,000.00
CS01	Byrne	IT	Assistant Prof	$2,000.00
MA01	Julia	Mathematics	Assistant Lec	$1,100.00
SP01	Maria	Sport	Professor	$4,000.00

SQL Output

facName	salary	salaryStatus
Adams	$3,000.00	Medium Salary
Byrne	$2,000.00	Low Salary
Julia	$1,100.00	Low Salary
Maria	$4,000.00	High Salary