

CE 223 DATABASE SYSTEMS

SECTION 3 & 4 - LAB 3

- Import the world database schema provided on the Blackboard and write the following SQL queries, PSM functions and triggers in MySQL.

1. At first, modify the country table of the world database schema to add an attribute called 'NumberOfCities' with a default value of 1. **(20 pts)**

After the modification, run the following query:

```
SELECT Name, Capital, NumberOfCities
FROM world.country
WHERE population < 500
ORDER BY Name;
```

, and make sure that you obtain a similar result like this:

Name	Capital	NumberOfCities
Antarctica	NULL	1
Bouvet Island	NULL	1
British Indian Ocean Territory	NULL	1
French Southern territories	NULL	1
Heard Island and McDonald Islands	NULL	1
Pitcairn	2912	1
South Georgia and the South Sandwich Islands	NULL	1
United States Minor Outlying Islands	NULL	1

Query;

```
ALTER TABLE country ADD NumberOfCities INT DEFAULT 1;
```

2. Clearly, we set the value of the `NumberOfCities` attribute to 1 for each country and this is not the correct value for many countries. Write a MySQL PSM function (called `GetCityCount`) that for a given country code, it returns the number of cities that country has. **(40 pts)**

```
DELIMITER //

CREATE FUNCTION GetCityCount(code CHAR(3))

RETURNS INT

BEGIN

    DECLARE cityCount INT;

    SELECT COUNT(ID) INTO cityCount FROM city

    WHERE CountryCode = code;

    RETURN cityCount;

END//

DELIMITER ;
```

3. Write a MySQL trigger that does not allow the deletion of cities which are the only cities in their countries. **(40 pts)**

```
DELIMITER $$
```

```
CREATE TRIGGER trigger1
```

```
BEFORE DELETE
```

```
ON city
```

```
FOR EACH ROW
```

```
BEGIN
```

```
    DECLARE total_cities INT;
```

```
    SELECT COUNT(city.ID)
```

```
    INTO total_cities
```

```
    FROM city
```

```
    JOIN country ON city.CountryCode = country.Code
```

```
    WHERE city.CountryCode = OLD.CountryCode;
```

```
    IF total_cities = 1 THEN
```

```
        SIGNAL SQLSTATE '45000'
```

```
        SET MESSAGE_TEXT = 'Cannot delete the only city in its country';
```

```
    END IF;
```

```
END $$
```

```
DELIMITER ;
```

MySQL Trigger Template

DELIMITER \$\$

CREATE TRIGGER <TRIGGER NAME>

<AFTER/BEFORE> <INSERT/UPDATE/DELETE> ON <table name>

FOR EACH ROW

BEGIN

IF <CONDITION> THEN (OPTIONAL)

<STATEMENT THAT PERFORMS REQUIRED TASK>

END IF;

END

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