## Assignment No: - 5

**Title: -** Write a Stored Procedure and function.

**Problem Definition: -**

To Design a PL/SQL stored procedure and function for the categorization of student. If marks scored by students in examination is <=1500 and marks>=990 then student will be placed in distinction category if marks scored are between 989 and900 category is first class, if marks 899 and 825 category is Higher Second Class

**Learning Objectives:-**

To write PL/SQL stored procedure and function.

**Learning Outcomes:-**

The ability write PL/SQL stored procedure and function

**Software and Hardware Requirement**

- OS-Linux
- Mysql
- 64 bit machine

**Theory:**

**Stored Procedure:**

A procedure (often called a stored procedure) is a subroutine like a subprogram in a regular computing language, stored in database.

A procedure has a name, a parameter list, and SQL statement(s). All most all relational database system supports stored procedure.

A Stored procedures are reusable and can be invoked by triggers, other storedprocedures, and applications.

Typically stored procedures help increase the performance of the applications.

Once created, stored procedures are compiled and stored in the database.

Stored procedures help reduce the traffic between application and database serverbecause instead of sending multiple lengthy SQL statements, the application has to send only name and parameters of the stored procedure.

**Types of parameters:**

Optional. One or more parameters passed into the procedure. When creating aprocedure, there are three types of parameters that can be declared:

1. IN - The parameter can be referenced by the procedure. The value of the parameter can not be overwritten by the procedure.
2. OUT - The parameter can not be referenced by the procedure, but the value of the parameter can be overwritten by the procedure.
3. IN OUT - The parameter can be referenced by the procedure and the value of theparameter can be overwritten by the procedure.

**Syntax:**

**CREATING PROCEDURE**

CREATE PROCEDURE procedure_name [ (parameter datatype [,parameter datatype]) ]

BEGIN

declaration_section

executable_section

END;

**EXECUTING PROCEDURE**

CALL procedure name;

DROP PROCEDURE

DROP PRODECURE procedure name;

## Example:

```
DELIMITER //
CREATE PROCEDURE GetAllProducts()
BEGIN
SELECT *  FROM products;

END //
DELIMITER ;
```

## Stored Function:

As same as Stored Procedures but Function always returns a result. Function can be called inside an SQL statement just like ordinary SQL functions,or within other stored procedure and functions.

**Type of parameters:**

When creating a function, all parameters are considered to be IN parameters (not OUT or INOUT parameters) where the parameters can be referenced by the function but can not be overwritten by the function.

A function parameter is the equivalent of the IN procedure parameter, as functions use the *RETURN* keyword to determine what is passed back.

Syntax:

**CREATING FUNCTION**

CREATE FUNCTION function_name [ (parameter datatype [, parameterdatatype]) ]

RETURNS return_datatype

BEGIN
declaration_sectionexecutable_section
END;

**EXECUTING FUNCTION**

SELECT function name();

**DROP FUNCTION**

DROP FUNCTION function name;

**Example:**

```
CREATE FUNCTION WEIGHTED_AVERAGE (n1 INT, n2 INT, n3 INT, n4INT)
RETURNS INT BEGIN
DECLARE avg INT;

SET avg = (n1+n2+n3*2+n4*4)/8;
RETURN avg;

    END
```

**Test Cases:-**

| Test Case no. | Input | Expected Output | Actual Output |
|---|---|---|---|
| TC_01 | DELIMITER // | | |
| | CREATE PROCEDURE | | |
| | GetAllProducts() | select all | |
| | BEGIN | products from | |
| | SELECT * FROM products; | the products | |
| | END // | table. | |
| | DELIMITER ; | | |
| TC_02 | CREATE FUNCTION | | |
| | WEIGHTED_AVERAGE (n1 INT, n2 | | |
| | INT, n3 INT, n4 INT) | | |
| | RETURNS INT | | |
| | DETERMINISTIC | Return | |
| | BEGIN | Weighted | |
| | DECLARE avg INT; | Average | |
| | SET avg = | | |
| | (n1+n2+n3*2+n4*4)/8; | | |
| | RETURN avg; | | |
| | END | | |

**Conclusion:** Thus have successfully studied and implemented stored procedure and function in PL/SQL.

**Questions:**

1) What is the difference between "procedure" and "function"?
2) What is the use of package?