Database Objects – Indexes and other database Objects

Database Objects

Object	Description
Index	Improves the performance of some queries
Procedure	A named PLSQL Subprogam or Block
Function	A named PLSQL Subprogam or Block
Package	Logically groups PLSQL items, types and sub programs
Trigger	Subprograms that are implicitly executed when a table is modified

Searching for a piece of data

"I need the phone number and location of our customer, named ……."

– frequent query by the Telemarketing executive

SQL statement :

SELECT PHONENUM, LOCATION WHERE FIRSTNAME like ' x '

– Each every row in Customer table is searched for this data
– A full table scan is done

Imagine going through each and every name in a telephone directory to find a particular person.

How can we reduce the search span ?

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An index is an optional structure, associated with a table or table cluster, that can be used speed data access. Simply put, an index is a pointer to data in a table. An index in a database is very similar to an index in the back of a book.

Database Index has:

- A few columns of the table that can be used to search the table very efficiently
- A pointer or direct link to the complete row in the original table

Syntax:-

CREATE INDEX indexname ON Table_name (attribute1, [attribute2 ...]);

Single column Index is created based on only one column in the table

A **composite index**, also called a **concatenated index**, is an index on multiple columns in a table.

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Unique indexes guarantee that no two rows of a table have duplicate values in the key column or column.

Nonunique indexes permit duplicates values in the indexed column or columns.

- B-tree

- B-tree cluster

- Hash cluster

- Bitmap indexes

- Bitmap Join Indexes

- Function-based

A **Procedure** is a named PL/SQL block or Subprogram which performs one or more specific task.

Similar to a procedure in other programming languages.

Also mentioned as **Stored Procedure** or simply **Proc.**

A **function** is a named PL/SQL Block which is similar to a procedure.

The major difference between a procedure and a function is that, a function must always return a value, but a procedure may not return a value but will produce an output.

Also mentioned as **Stored Function** or simply **Func.**

A **package** is a schema object that groups logically related PL/SQL types,

items and subprograms(Procedures or functions) .

Packages offer several advantages and they are

- **Modularity**

- **Easier Application Design**

- **Information Hiding**

- **Added Functionality**

- **Better Performance**

Triggers are procedures that are implicitly executed when an INSERT, UPDATE, or DELETE statement is issued against the associated table.

Triggers are similar to stored procedures.

A trigger can include SQL and PL/SQL statements to execute as a unit and can invoke stored procedures.

Triggers are implicitly fired (executed) by Oracle when a triggering INSERT, UPDATE, or DELETE statement is issued against the associated table.