Tuesday, February 27, 2024 10:46 AM

Notes Link:
https://bit.ly/oracledbnotes

admin prathyusha :
9121104161 [whatsapp only]

Oracle [SQL & PL/SQL] @ 9:00 AM (IST) By Mr.Shiva Chaitanya
Day-1 https://youtu.be/HP8OW4R3H6E
Day-2 https://youtu.be/0AJKOUVVMiQ
Day-3 https://youtu.be/m67jW6z81h8
Day-4 https://youtu.be/-XMfkUe9xHM

ORACLE

Monday, February 26, 2024 9:18 AM

ORACLE:

Data Store
Database
DBMS
RDBMS
Metadata

Data Store:
The location where data is stored is called "data store".

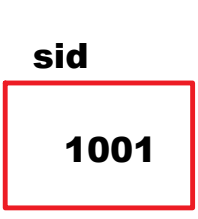
Examples:
File, Database

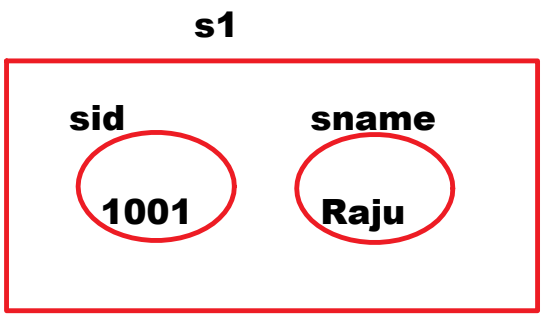
Goal:
Storing Business data permanently

int sid;

sid=1001
sid => variable

Student s1 = new Student();





- variable and object are temporary.
- to store the data permanently we use FILE or DATABASE

FILE	DATABASE
• developed for single user	• developed for multiple users
• used to store small amounts of data	• used to store large amounts of data
• No security	• It is secured

Database:

- Database is a kind of data store.
- Database is a location where organization's business data stored permanently.

Online shopping

Searching for products
Adding to wishlist
Placing order
payment

Amazon DB

Products
Wishlist
Orders
Payments
Customers

Bank DB

DBMS:

- **DBMS => DataBase Management System / Software.**
- **DBMS is a software that is used to create and maintain the database.**

Before 1960s => BOOKS

In 1960s => FMS

In 1970s => HDBMS [Hierarchical DBMS]
NDBMS [Network DBMS]

In 1976 => RDBMS [Relational DBMS] => E.F.Codd

ORACLE company Founder => Larry Ellison

In 1979 => ORACLE => RDBMS

RDBMS:

- **RDBMS is a kind of DBMS.**
- **RDBMS => Relational DataBase Management System / Software**
- **Relation => Table**
- **It is used to create and maintain the database in the form of tables.**

Examples:

ORACLE, SQL SERVER, DB2, Postgre SQL, MY SQL

Browser
- **Google Chrome**
- **Mozilla Firefox**
- **Opera**

Laptop
- **Dell**
- **Microsoft**

Table:

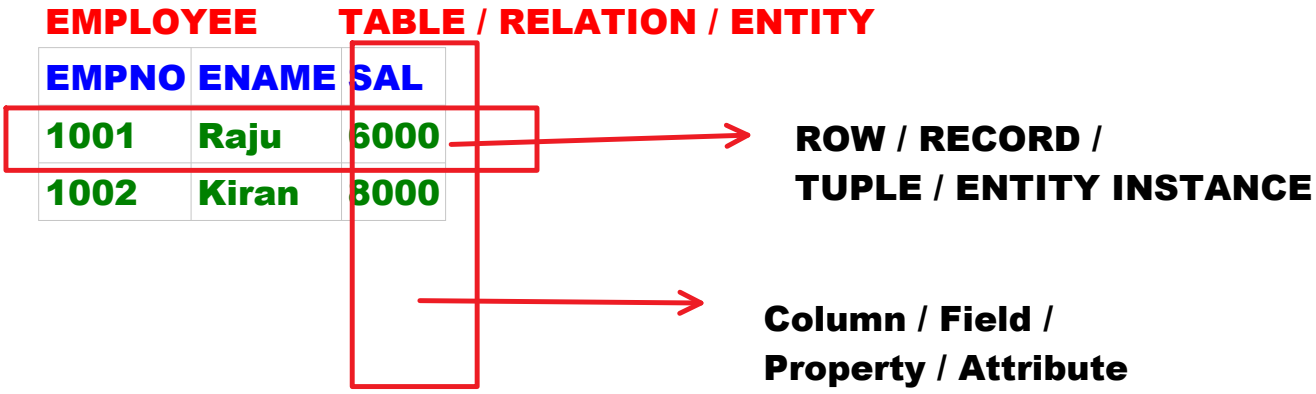
Table is a collection of rows and columns

Row:

*** Horizontal representation of data**

Column:

Vertical representation of data



Metadata:

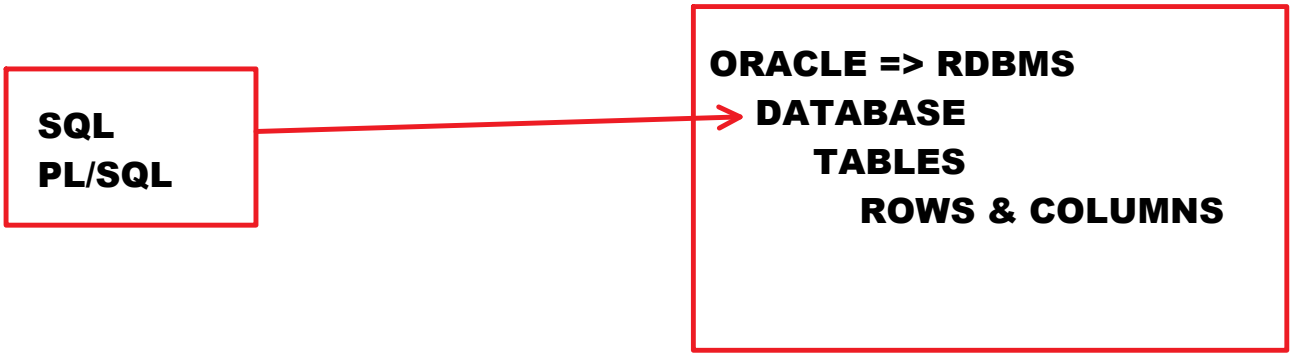
- **Metadata is the data about the data.**

- **Example:**
  - **Field name => Sid, Sname, Fee**
  - **Table name => STUDENT**
  - **Data type => NUMBER, VARCHAR2, DATE**
  - **Field Size => NUMBER(4), VARCHAR2(10)**

STUDENT

Sid NUMBER(4) -9999 TO 9999	Sname VARCHAR2(10)	Fee
1001	Raju	6000
KIRAN ERROR		
25-DEC-2020 ERROR		
1002		
9999		
10000 => ERROR		

Data Store	**is a location where data is stored**
Database	**is a kind of data store** **is a location where organization's business data stored permanently**
DBMS	**is a software => used to create and maintain the database**
RDBMS	**is a software => used to create and maintain the database in the form of tables**
Metadata	**is the data about the data**



Bank DB

Customers TABLE

CID	CNAME	Mobile	MailID	Addhar	PAN

Transactions TABLE

TID	T_DATE_TIME	T_TYPE	AMOUNT

Branches TABLE

IFSC_CODE	CITY	STATE	COUNTRY

Syllabus

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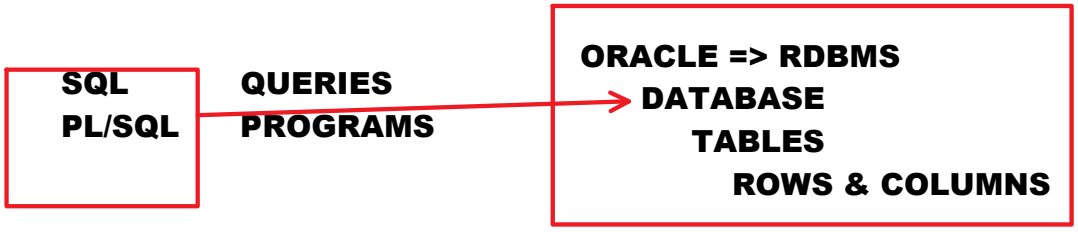
ORACLE



SQL:

TABLES			
	SQL Commands	**DDL, DML, DCL, TCL, DRL**	
	Built-In Functions	**String, Number, Date, Conversion, Analytic, ...**	
	CLAUSES	**GROUP BY, HAVING, ORDER BY, ...**	
	JOINS	**Inner joins, outer joins, croos join ...**	
	SUB QUERIES	**single row, multi row, correlated, ...**	
	SET OPERATORS	**UNION, UNION ALL, INTERSECT, ...**	
VIEWS	**Simple View, Complex View**		
INDEXES	**B-Tree Index, Bitmap Index**		
Materialized Views	**refreshing**		
Sequences	**sequences identity**		
Synonyms			

PL/SQL:

PL/SQL Basics	**data types** **declare** **assign** **print** **read** **using SQL commands**
Control Structures	**Conditional** **looping** **Jumping**
CURSORS	**steps** **types of cursors** **implicit cursor** **explicit cursor** **ref cursor** **parameterized cursor** **inline cursor**
EXCEPTION HANDLING	**Built-in Exceptions** **User-Defined Exceptions** **Pragma exception_init()** **raise_application_error()**
COLLECTIONS	**types:** **associative array** **nested table** **v-array**
Stored procedures	
Stored Functions	
Packages	
Triggers	
Working with LOBs	
Dynamic SQL	

ORACLE

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ORACLE:

- **ORACLE is a Relational DataBase Management Software.**
- **It is used to create and maintain the database in the form of tables.**
- **database => organization's business data**
- **It allows us to store, manipulate and retrieve the data of database.**

Manipulate => INSERT / UPDATE / DELETE

Examples:
emp joined => INSERT
emp promoted => UPDATE
emp resigned => DELETE

Retrieve => opening existing data

Check balance
Searching for products
Transaction Statement

- **ORACLE DB Software 2nd version released in 1979. They didn't release 1st version to market.**
- **For WINDOWS OS => latest version is: ORACLE 21C**
- **For LINUX OS => latest version is ORACLE 23C**

Before 1960s => BOOKS

1960s => FMS

1970s => HDBMS [heirarchical]
NDBMS [network]

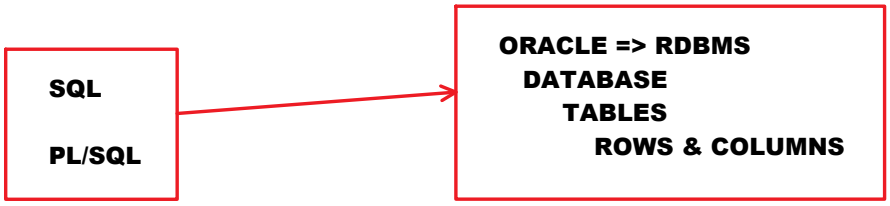
1976 => RDBMS concept => E.F.Codd

Larry Ellison => Founder of ORACLE

1977 => established company
Software Development Laboratories

1979 => renamed => Relational Software Inc.
ORACLE software released

1983 => renamed => ORACLE corp.



To communicate with ORACLE DB, we can use 2 languages.
They are:

- **SQL**
- **PL/SQL**

SQL:

- **SQL => Structured Query Language**

- **SQL is a query language.**
- **SQL is used to write the queries.**
- **Query => request / command / instruction**
- **Query is a request that is sent to DB SERVER.**
- **Queries are written to communicate with ORACLE Database.**

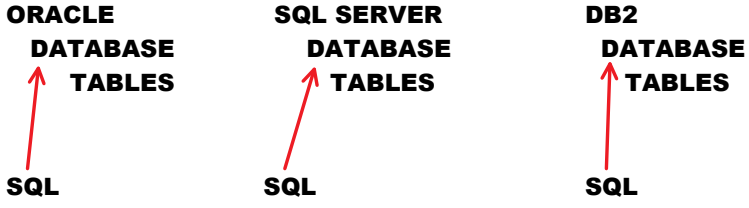
- **SQL is a Non-Procedural Language. We will not write any set of statements or programs in SQL. Just we write Queries.**

- **SQL is Unified Language. It is common language to work with many Relational Databases.**

In C:
Function => is a set of statements

In Java:
Method => is a set of statements

In PL/SQL:
Procedure => is a set of statements



- **SQL is 4GL [4th Generation Language]. 4GLs provide readymade commands and readymade functions.**

Find max sal

max(sal)

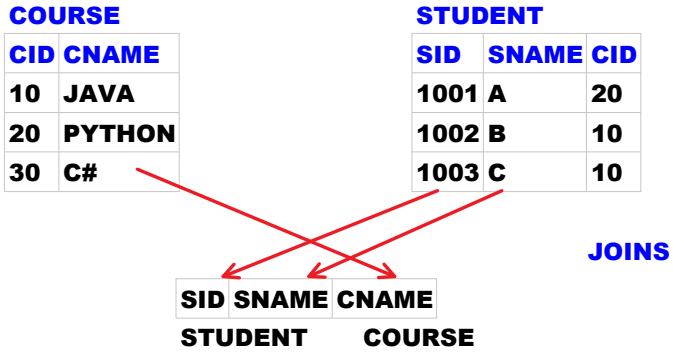
Programming Language

Program => 10 lines code

how to do

what to do

- SQL provides operators to perform operations like arithmetic or logical operations.
- SQL provides JOINS concept to retrieve data from multiple tables



- It provides SUB QUERIES Concept.

Display emp records whose salary is more than BLAKE?

```
SELECT ename,sal FROM emp
WHERE sal>(SELECT sal FROM emp
WHERE ename='BLAKE');
```

PL/SQL:

- PL/ SQL => Procedural Language / Structured Query Language.
- It is programming language.
- It is a procedural language.
  procedure => a set of statements / program
- PL/SQL = SQL + Programming
- PL/SQL is extension of SQL.
- In PL/SQL we develop programs to communicate with ORACLE DB.

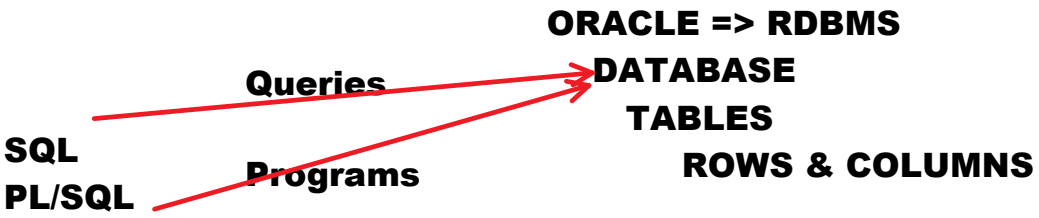
SQL Commands:

SQL provides 5 sub languages. They are:

DDL
DRL / DQL
DML
TCL
DCL / ACL

DDL: • **Data Definition Language** • **Data Definition => metadata** • **It deals with metadata**	**CREATE** **ALTER** **DROP** **FLASHBACK [ORACLE 10g]** **PURGE [ORACLE 10g]** **TRUNCATE** **RENAME**
DRL / DQL • **DRL => Data Retrieval Language** • **DQL => Data Query Language** • **Retrieve => opening existing data** • **It deals with Data Retrievals**	**SELECT**
DML • **Data Manipulation Language** • **manipulation => insert / update / delete** • **it deals with data manipulations**	**INSERT** **UPDATE** **DELETE** **INSERT ALL [Oracle 9i]** **MERGE [Oracle 9i]**
TCL • **Transaction Control Language** • **It deals with transactions.** • **transaction => is a series of actions**	**COMMIT** **ROLLBACK** **SAVEPOINT**
DCL / ACL • **DCL => Data Control Language** • **ACL => Accessing Control Language**	**GRANT** **REVOKE**

- **it deals with data accessibility**



SQL:

DDL [metadata]	DRL / DQL [retrievals]	DML [data]	TCL [transactions]	DCL [accessibility]
create alter drop flashback purge truncate rename	select	insert update delete insert all [oracle 9i] merge [oracle 9i]	commit rollback savepoint	grant revoke

CREATE:
CREATE command is used to create the ORACLKE DB Objects like Tables, Views, Indexes ...etc.

Bank DB

Customers Table

CID	CNAME	CCITY	AADHAR	PAN	MOBILE

Transactions Table

TID	T_DATE_TIME	T_TYPE	ACNO	AMOUNT

ORACLE DB Objects:

- Tables
- Views
- Indexes
- Materialized Views
- Sequences
- Synonyms
- Stored Procedures
- Stored Functions
- Packages
- Triggers

Customers Table

CID	CNAME	CCITY	AADHAR	PAN	MOBILE

Transactions Table

TID	T_DATE_TIME	T_TYPE	ACNO	AMOUNT

Synonyms
Stored Procedures
Stored Functions
Packages
Triggers

ALTER:

- **ALTER => Change**
- **ALTER command is used to change structure of the table.**
- **Using ALTER command we can:**
  - **Add the Columns**
  - **Rename the Columns**
  - **Drop the Columns**
  - **Modify the field size**
  - **Modify the data type**

Example:

EMPLOYEE

EMPNO NUMBER(4) CHAR(8)	ENAME VARCHAR2(10)	SAL

GENDER	MAIL_ID

HYD_1001
DLH_1002
BLR_1003

Note:
In ORACLE 10g version, a new feature added. i.e. RECYCLEBIN

DROP	**used to drop the table when table is dropped, it goes to recyclebin**	

FLASHBACK	**used to restore the dropped table**
PURGE	**used to delete the table from Recyclebin**

Table:

- **is a collection of rows and columns.**

EMPLOYEE → **Table**

EMPNO	ENAME	SAL
1001	A	6000
1002	B	7000

→ **Table Structure [columns]**

→ **Table data [rows]**

Truncate	**used to all records from table with good performance**

EMPLOYEE

EMPNO	ENAME	SAL
~~1001~~	A	6000
~~1002~~	B	7000

RENAME	**used to rename the table**

DML:

Manipulations => Insert / Update /Delete

emp joined	**insert emp record**	**INSERT**
emp promoted	**update the job title and salary**	**UPDATE**
emp resigned	**delete emp record**	**DELETE**

TCL:

Transaction => is a series of actions [SQL commands]

Examples:
Withdraw, Deposit, Fund Transfer, Placing Order

Fund Transfer:
Accounts

ACNO	NAME	BALANCE
1001	A	100000
1002	B	50000

transfer 20000 amount from 1001 to 1002:
[Transaction]

- **sufficient funds? => SELECT**
- **UPDATE from a/c balance => UPDATE**
- **UPDATE to a/c balance => UPDATE**

A transaction must be successfully finished or cancelled.

If transaction is successful	**save it**	**COMMIT**
If transaction is unsuccessful	**cancel it**	**ROLLBACK**

GRANT => used to give permission to other users
REVOKE => used to cancel the permission.

CREATE

Friday, March 1, 2024 9:24 AM

CREATE:

CREATE command is used to create the tables.

Syntax:

```
CREATE TABLE <table_name>
(
   <field_name> <data_type> [,
   <field_name> <data_type> ,
   .
   .]
);
```

EMPLOYEE

EMPNO	ENAME	SAL

< >	ANY
[ ]	OPTIONAL

Note:

Till ORACLE 21C, we can create max of 1000 columns only.

In ORACLE 23C, we can create max of 4096 columns.

Data types in ORACLE SQL:

Data type tells,

- **which type of data should be accepted in column.**
- **how much memory has to be allocated.**

ORACLE SQL provides following data types:

Character Related **'RAJU'** **'MANAGER'** **'B.Tech'**	**Char(n)** **Varchar2(n)** **LONG** **CLOB** **nChar(n)** **nVarchar2(n)** **nCLOB**
Integer related **1234** **78** **567** **18**	**NUMBER(p)** **Integer** **Int**
Floating point related **7000.00** **2000.80** **67.89**	**NUMBER(p,s)** **float** **binary_float** **binary_double**
Date & time related **25-DEC-23** **29-FEB-24 10:30.0.0 AM**	**DATE** **TIMESTAMP [oracle 9i]**
Binary related	**BFILE** **BLOB**

images, audios, videos	

Character related data types:

Character related data types can accept letters, digits and special chars.

Char(n):

- it is used to hold string values.
- n => max no of chars.
- Fixed length data type.
- extra memory will be filled with spaces
- max size: 2000 bytes [2000 chars]
- default size: 1

Varchar2(n):

- it is used to hold string values.
- n => max no of chars.
- Variable length data type.
- extra memory will be removed.
- max size: 4000 bytes [4000 chars]
- default size: no default size

Fixed length

T1

F1 CHAR(10)	F2 VARCHAR2(10)
RAMU6SPACES	RAMU
SAI7spaces	SAI
NARESH4spaces	NARESH

Variable Length

10
10
10

4
3
6

State_Code CHAR(2)

TS
AP
MH
WB
UP

Ename VARCHAR2(10)

Ravi
Kiran
Ramesh
Sai

VEHICLE_NUMBER CHAR(10)

TS08AA1234

mail_id VARCHAR2(30)
---
sai_lumar1234@gmail.com
raju@nareshit.com

Note:
VARCHAR2 data type can hold max of 4000 chars only.
To hold more than 4000 chars we use LONG or CLOB.

To hold large amounts of chars we use LONG or CLOB.
CLOB is best one. Because, LONG has some drawbacks.

LONG:

- it is used to hold large amounts of chars
- LONG has some restrictions:
  - we can create only 1 column as LONG type in a table.
  - We cannot use built-in functions on LONG type column.
- max size: 2GB

CLOB:

- CLOB => Character Large Object
- it is used to hold large amounts of chars.
- We can create multiple columns as CLOB type in a table
- We can use built-in functions on CLOB type column.
- Max size: 4GB