SQL

Database – collection of organized data/information.

A database is an organized collection of data. It is the collection of schemas, tables, queries, reports, views, and other objects

Popular dbs:

Oracle, MySql – sun micro systems->oracle, SqlServer- Microsoft, Microsoft Access, Ibm-DB2

Oracle- most widely used-48%

A table is a collection of related data entries and it consists of columns and rows.

rdbms by ef codd from ibm in sanjose

oracle is first commercial rdbms and most widely used-48%

sql is ansi standard

Student Management System:

Student- id, email, phone, address

Whiteboxlearning.com – get all the details w.r.to students who enrolled in Nov batch

Get all details of student who have completed assignments/mocks.

Insert all the students who are from Jan batch into database

Delete the data of students who are inactive prior to 2015.

Update the student data based on interviews.

Macys- Order management system

Indeed- Resume Management

Employee Management System

CRUD operations – Create, Read, Update and Delete the data

RDBMS- Relational DBMS by EF Codd from IBM in Sanjose

A database management system (DBMS) is a computer software application that interacts with the user, other applications,and the database itself to capture and analyze data.

A general-purpose DBMS is designed to allow the definition, creation, querying, update, and administration of databases.

A table is collection of related data entries in the form of rows and columns.

RDBMS- establishes a relation between the tables

ER diagram – Entity Relationship diagram.

Entity is Table

Attribute is column

Customer(cusid,email) places Orders(orderId, Items,OrderCost )

Orders contain Items(ItemId,ItemName,ItemCost)

PrimaryKey : It is a column/attribute or setOfColumns which helps to uniquely identify a row

in the table.

itemId+OrderId

Max combination of columns is 16 .

ForeignKey : A foreign key (FK) is a column or combination of columns that is used to establish and enforce a link between the data in two tables to control the data that can be stored in the foreign key table. In a foreign key reference, a link is created between two tables when the column or columns that hold the primary key value for one table are referenced by the column or columns in another table. This column becomes a foreign key in the second table

Relations:

One to One :

Customer can have one ssn, registered emailaddress

Student has drivingLicenseNum, StudentId,Address

One to Many:

Many to Many:

Data

457487539 – student id

Book - author

List of groceries -

Information – Meaning to data/interpreted data

Icloud,excelsheets,dropbox,googledrive

SQl- Structured Query language to manage and access the RDBMS data.

Language to communicate with DB’s and perform CRUD operations.

Eg:Oracle, sql server, my sql etc

Example scenario:

Get all the orders that happened in this week

Select \* from orders where order\_date between ’16-1-17’ and ’22-1-17’

NoSQl DB – DB which do not have tables and attributes but data is stored in the files

in the form of key value pairs.

Stusent : {

iD: 678

name: Vikas

Phone:647328799

}

Eg: MongoDB,Cassandra etc

To execute sql queries- we use tools in real time

SQLDeveloper, Toad etc..

1. Download the tool
2. Give Connection details of DB

Eg:

Oracle DB:

hostname: hr.cwjgdp1wxdy2.us-west-1.rds.amazonaws.com

port:1521

username: whiteboxqa

password: Excellence

database(sid): ORCL

1. Execute the queries

SQL:

Retrieval operation/ Fetch any information from tables- Select keyword

Where- helps to give the condition

SQL statements:

DDL- data definition language

Create

Alter

Drop

truncate

DML-Data Manipulation Language

Select

Insert

Update

Delete

Merge

DCL:

Grant

Revoke

TCL:

Commit

Rollback

SavePoint

SQl keywords,table names, column names are not case sensitive but the data is always case sensitive.

DataTypes – what kind of data is being stored in a particular column

Salary- decimal or integer-Number

Name or email – String or Set of characters - Varchar

Hire\_date – Date

BLOB

Number,Varchar2,Date

Arithmetic - +,-,\*,/

Conditional- =,<>,<,>,<=,>=,In,like

Logical- And, or, not

SingleRowFunction- every row has individual result

Add function

1+2= 3

2+2=4

3+2=5

4+2=6

5+2=7

MultiRowFunction- For group of rows there is a single result

Find avg of the numbers

1

2

3

4

5

1+2+3+4+5/5 = 3

Sql-

Substr(“hello”, startingposition, noOfCharactersFromStartPostion)

First char position starts from 1

If u do not give no of chars it gives all chars till end of tring

customer orders

based of no of orders

employers work in diff depts

IT\_PROG

ADMIN

ACCOUNTANT

HR

group employers based on department

group by department\_name

Rule:

In group by statement- the columns in select statement should be either part of group by clause

or they can be part of aggrregate function

whenever you use group functions or group by in select statment:

the column in the select statement should be either part iof group function or part of group by clause

group func should not be used along with where clause

Joins: combine the results from 2 or more tables

Natural Join : It joins 2 tables based on all the common columns between 2 tables provided the column name and the data type of column is same for both the tables

InnerJoin

OuterJoin

* Full Outer Join -
* Right Outer Join - all matched rows between 2 tables + unmatched rows from right table
* Left Outer Join – all matched rows between 2 tables + unmatched rows from left table

Cross Join/Cartesian Product

Employee table:

PK- employee\_id

FK-department\_id

23 Steven [a@a.com](mailto:a@a.com) 30

24 Paul [a@b.com](mailto:a@b.com) 40

Department:

Pk-department\_id

30 IT

40 Sales

50 HR

Diff b/n InnerJoin and Outer Join:

innerJoin only gives matched rows b/n 2 tables

outerJoin only gives matched and also unmatched rows based on what kind of outer joinbeing used b/n 2 tables

SubQueries:

Single Row Operators with single row subqueries : whenever subquery returns a single row as output we can combine with main query using any of single row operators like =,<,>,<=,>=

MultiRow Operators with multi row subqueries: whenever subquery returns a multiple rows as output we can combine with main query using any of multi row operators like in, any, all

Any – like or

All – like and

Rownum is used to limit the rows to certain number

Rownum is to be used only with <=

We cannot use rownum for directly = or >

<http://www.oracle.com/technetwork/issue-archive/2006/06-sep/o56asktom-086197.html>

Set Operators:

A={4,5,6,7}

B={4,5,6}

Union: common rows by eliminating duplicates

4,5,6,7

UnionAll: Gives all the rows without eliminating duplicates

4,5,6,7,4,5,6

Intersect:

4,5,6

Minus:

7

Constraints: Which add rules or set restrictions to the columns.

Primary Key – Unique+NotNull – which helps to identify a row uniquely from table

Foreign Key- used to relate 2 tables

Unique – no duplicates are allowed

Not null – It should not be null

DDL: Create,alter,drop,truncate

Create table:

Create table TableNAme(

columnname datatype constraint,

columnname datatype constraint,

)

DDL: create, alter, drop, truncate

DDL statements are automatically committed

DML : Select, insert, update, delete

Commit should be done manually.

DCL:

TCL: transaction control

4-5 statements together

Database Objects:

Some of the Database objects are Tables,Sequences, views,Triggers, Procedures, Functions, Synonyms etc..

Sequence: is a DB object that helps to generate column data as per the given specification

View: Represents set of columns as per given query and is used to fetch frequently used column data from multiple tables.

Also used when we do not want to give permission to actual tables.

Trigger: Invoke certain action based on given condition

Uname, email, pwd… userid

1,2,3,4,5,6,…….