DATABASE TESTING

**Q) What is Database Testing?**

**Database testing is the process of evaluating the accuracy, reliability, and performance of a database system. The main advantage of database testing is to check data saved in table or not**

**Q) What is SQL?**

**Ans:**

**SQL stands for Structured Query Language. it is database language which is used to communicate with database. It having sub languages like DDL, DML, DQL, DCL, TCL**

**Q) What is Data and database?**

**Ans:**

**Data: It is rawfact (i.e., number, characters, special characters…etc)**

**Information: Processed data is called as information**

**Database: It is collection of interrelated data/information**

**Q) What is DBMS?**

**Ans:**

**It is a software which is used to manage and maintain data/information under database**

**Q) What are the types of databases?**

**Ans:**

**1)Hierarchical DBMS**

**2)Network DBMS**

**3)Relational DBMS**

**4)Cloud DBMS**

**5)Centralized DBMS**

**6)Distributed DBMS**

**7)Personal DBMS**

**Q) What is RDBMS?**

**Ans:**

**It stands for Relational Database Management System, it is used to manage relational databases, it has 2 types**

**1)Object relational DBMS**

**Complete depends on SQL**

**Data can be stored in tables**

**e.g., Oracle, SQL Server, MySQL, db2**

**2) Object oriented DBMS**

**Complete depends on OOPS concept**

**Data can be stored in the form of object**

**e.g., MongoDB, Cassandra**

**Q) What are table and Fields?**

**Ans:**

**Table is collection of rows and columns**

**A row is group of columns**

**Rows also called as tuples**

**Columns is called as fields, its also called as attributes**

Q) What are the tools available in market for SQL?

Ans:

Oracle SQL Developer

MySQL Workbench

PostgreSQL

Microsoft Azure

**Q) Datatypes in SQL?**

**Ans:**

**Datatype: What type of data storing into a column**

**1)String datatype: char, varchar**

**2)Numeric Datatype: int, float**

**3)Date and Time: Date, Date time, Time**

**Q) Sub languages of SQL?**

**Ans:**

**1)DDL (Data Definition Language)**

**a)create**

**e.g., create table demo1(stid int,sname varchar(20),doj date);**

**b)alter(to change/modify structure of a table)**

**i)alter-modify(to change datatype of a column and size of datatype)**

**e.g., alter table demo modify sname varchar2(30);**

**ii)alter-add(adding a new column to an existing table)**

**e.g., alter table demo add location varchar2(30);**

**iii)alter-rename(to change a column name in a table)**

**e.g., alter table demo rename column location to loc;**

**iv)alter-drop(to delete column from a table)**

**e.g., alter table demo drop column loc;**

**c)rename**

**To change table name in database**

**e.g., rename demo to demotable;**

**d)truncate**

**To delete all rows from a table at a time**

**e.g., truncate table demotable;**

**e)drop**

**To delete entire table from a database memory**

**e.g., drop table demotable;**

**New features**

**vi)recyclebin**

**It is system defined table, to store information about dropped table from db**

**e.g.,**

**desc recyclebin;**

**select object\_name, original\_name from recyclebin;**

**vii)flashback**

**It is command which is used to restore dropped table from recyclebin to database memory**

**e.g.,**

**flashback table table\_name to before drop;**

**viii)purge**

**This command is used to delete a table permanently from recyclebin**

**e.g.,**

**purge table table\_name;**

**2)DML (Data Manipulation Language)**

**a)insert**

**e.g., insert into demo values(101,'sam','22-mar-2024');**

**b)update**

**e.g., update demo set sname='jack' where stid=101;**

**c)delete**

**e.g., delete from demo where stid=101;**

**New features**

**i)insert all**

**ii)merge**

**3)DQL (Data Query Language)**

**a)select (select statement is used to retrieving data from a table)**

**e.g., select \* from demo;**

**4)TCL (Transaction Control Language)**

**a)commit**

**To make a transaction is permanent**

**e.g., commit;**

**b)rollback**

**To cancel a transaction, but once we commit a transaction then we cannot rollback**

**e.g., rollback;**

**c)savepoint**

**when we created a savepoint internally system is allocating memory to a pointer and in this memory we can stored the required row/rows which we want to rollback or cancel in the future**

**e.g.,**

**savepoint p1;**

**delete from student where sid=1021;**

**rollback to p1;**

**5)DCL (Data Control Language)**

**a)grant**

**This command is used to give permission to the user**

**e.g.,**

**grant connect, create table, unlimited tablespace to username;**

**b)revoke**

**This command is used to cancel permissions of the user**

**e.g.,**

**revoke select, insert on table\_name from username;**

**Q) Difference between Delete and Truncate?**

|  |  |
| --- | --- |
| **Delete** | **Truncate** |
| **It is DML command** | **It is DDL command** |
| **It can delete a specific row** | **It can’t delete a specific row** |
| **It is temporary deletion** | **It is permamant deletion** |
| **It can restore data into a table by using rolback** | **It can restore data into a table by using rolback** |
| **The execution speed is slow** | **The execution speed is fast** |

**Q) Joins and types of Join?**

**Ans:**

**Joins are used to retrieving the required data from multiple tables at a time**

**TYPES OF JOIN**

**1.Inner Join**

**Retrieve all the matching rows from both table is inner join**

**select \* from students inner join course on students.cid=course.cid;**

**2.Left Outer Join**

**Retrieving matching rows from both table but** **unmatching rows from left side table is left outer join**

**select \* from students left outer join course on students.cid=course.cid;**

**3.Right Outer Join**

**Retrieving matching rows from both table but unmatching rows from right side table is right outer join**

**select \* from students right outer join course on students.cid=course.cid;**

**4.Full Outer Join**

**Retrieving matching and unmatching rows from both table is full outer join**

**select \* from students full outer join course on students.cid=course.cid;**

**5.Cross Join**

**Cross join is used to join each row of a table with each row of another table**

**select \* from students cross join course;**

**6.Self Join**

**Joining a table by itself is called as self join**

**select t1.ename,t1.city from test8 t1,test8 t2 where t1.city=t2.city and t2.ename='smith';**

**Q) What is a aggregate functions?**

**Ans:**

**An aggregate function is used to perform calculation on multiple values and returns a single value**

1. **sum(): return a total value**

**e.g.,**

**select sum(sal) tot\_sal from emp;**

1. **avg(): return the average of total values**

**e.g.,**

**select avg(sal) from emp;**

1. **count(): return no of rows in a table**

**e.g.,**

**select count(\*) from emp; --counting all values including duplicates and nulls**

**select count(name) from emp; --counting all values including duplicates but not nulls**

**select count(distinct name) from emp; --counting unique values only**

1. **max(): return a maximum value**

**e.g.,**

**select max(sal) from emp;**

1. **min(): return a minimum value**

**e.g.,**

**select min(sal) from emp;**

**Q) What is constraints?**

**Ans:**

**Constraints are used to restrict unwanted data into a table**

**1)Unique:**

**To restrict duplicate values but allows nulls**

**e.g.,**

**create table test(sno int unique, name varchar(10));**

**create table test(sno int, name varchar(10), unique(sno, name));**

**2)Not Null:**

**To restrict nulls but allowed duplicates values**

**e.g.,**

**create table test(sno int not null, name varchar(10));**

**create table test(sno int, name varchar(10), not null(sno, name));**

**3)Check:**

**To check values with user defined condition on a column**

**e.g.,**

**create table test(sno int, sal number(10) check(sal>=10000));**

**4)Primary Key:**

**It is combination of unique and not null constraints. A table is having only one primary key constraint**

**e.g.,**

**create table test(sno int primary key, sal number(10));**

**alter table emp add constraint pk\_eid primary key(eid);**

**5)Foreign Key:**

**Foreign It is used to create relationship between table**

**e.g.,**

**create table dept1(no int primary key, dname varchar(10));**

**create table emp1(eid int primary key, dname varchar(10), no int references dept1(no));**

**alter table child add constraint fk\_eid foreign key(eid) references parent(eid);**

**6)Default:**

**It is used to assign a user defined default value to a column**

**e.g.,**

**create table test(eid int, sal number(10) default 10000);**

**Q) What is Clauses?**

**Ans:**

**Clause is a statement which is used to adding facility like grouping, filtering, sorting and finding the data**

**1)Where:**

**It is used for filtering rows before grouping data in a table**

**Select \* from emp where empno=7788;**

**2)Order by:**

**It is used to arrange a specific column value in ascending/descending order**

**Select \* from emp order by sal asc;**

**Select \* from emp order by sal desc;**

**3)Group by:**

**It is used to divide groups based on columns, when we use group by clause we should use an aggregative functions like sum(), avg(), count(), mix(), min()**

**Select gender, count(gender) from student group by gender;**

**4)Having:**

**It is used for filtering rows after grouping data in a table, it can use along with group by clause only**

**Select job,count(job) from emp group by job having count(job)>3;**

**(Sequence of clause: Where > Group By > Having > Order By)**

**Q) What is Index?**

**Ans:**

**Index is an db object which is used to retrieval the required row from a table fastly**

**Create index i1 on emp(sal);**

**Q) Like Operator?**

**Ans:**

**Comparing a specific character string pattern. When we use like operator we should use the following wildcard operators %, \_**

**select \* from emp where ename like 'S%';**

**select \* from emp where ename like '%R';**

**select \* from emp where ename like 'M%N';**

**select \* from emp where ename like '%I%';**

**select \* from emp where ename like '\_\_\_\_';**

**select \* from emp where ename like '\_O%';**

**select \* from emp where ename like 'S%';**

**Q) IN Operator?**

**Ans:**

**Comparing the list of values within a single condition**

**select \* from emp where empno in(7369,7499,7521);**

**Q) Between Operator?**

**Ans:**

**Working on particular range, it can work with ‘and’ operator only**

**select \* from emp where sal between 1500 and 3000;**

**select \* from emp where hiredate between '01-jan-81' and '31-dec-81';**

**select \* from emp where hiredate not between '01-jan-81' and '31-dec-81';**

**Q) Distinct Keyword?**

**Ans: It is used to remove duplicate value from a specific column**

**select distinct deptno from emp;**

Q) What is rowid?

Ans:

Whenever we insert a new row data into table internally system will generate a unique row identification address for each row wise in a table, these id’s are saved in database memory so these are permanent id’s

Select rowid,ename from emp;

Q) What is rownum?

Ans:

To generate row numbers to each row wise in a table automatically, row numbers are not saved in database so that these are temporary numbers

Select rownum,ename from emp;

SQL Queries

Q) finding maximum salary

select \* from emp where sal=(select max(sal) from emp);

Q) finding second maximum salary

select \* from emp where sal=(select max(sal) from emp where sal<(select max(sal) from emp));

Q) Write a query to get the EmpFname from the EmployeeInfo table in the upper case using the alias name as EmpName

SELECT UPPER(ename) AS EmpName FROM emp;

Q) Write a query to get the number of employees working in the department ‘HR’

SELECT COUNT(\*) FROM EmployeeInfo WHERE Department = ‘HR’;

Q) What query will you write to fetch the current date?

select sysdate from dual;

Q) Write a query to create a new table whose data and structure are copied from another table

CREATE TABLE NewTable AS SELECT \* FROM EmployeeInfo;

Q) Write a query to display the names of employees that begin with ‘S’

SELECT \* FROM EmployeeInfo WHERE EmpFname LIKE ‘S%’;

Q) Write a query to retrieve the highest 3 salary

select \* from (select distinct sal from emp where sal is not null order by sal desc) where rownum < 4;

Q) Write a query to retrieve the nth highest salary

select id,salary from emp e1 where n-1=(select count(distinct salary) from emp e2 where e2.salary>e1.salary);

Q) Write a query to obtain relevant records from the EmployeeInfo table ordered by Department in ascending order and EmpLname in descending order

SELECT \* FROM EmployeeInfo ORDER BY Department asc, EmpFname desc;

Q) Write a query to get the details of employees whose EmpFname ends with ‘A’

SELECT \* FROM EmployeeInfo WHERE EmpFname LIKE ‘%a’;

Q) Create a query to obtain display employees having salaries equal to or greater than 150000

SELECT EmpName FROM Employees WHERE Salary>=150000;

Q) Create an SQL query to fetch EmpPostion and the total salary paid for each employee position

SELECT EmpPosition, SUM(Salary) from EmployeePosition GROUP BY EmpPosition;

Q) Write an SQL query to find even and odd records in the EmployeeInfo table

select \* from emp where mod(eid,2)=0 --even

select \* from emp where mod(eid,2)=1 --odd

Q) Write a query to find duplicate records from a table

delete from test where rowid not in (select max(rowid) from test group by sno);