SQL AS CAAT

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SESSION OBJECTIVES

- After this Session Participants would be able to:
  - Explain the Basics of SQL and its importance in Audit.
  - Constitute simple SQL Statements.
  - Build SELECT statements.
  - Use Clauses viz. WHERE, ORDER BY, GROUP BY, HAVING etc in SELECT Statements.
  - Use Operators viz. AND, OR, NOT, IN, LIKE, BETWEEN etc. in SELECT Statements.
  - Use group variables in SELECT Statements.

WHAT IS SQL?

The term SQL stands for Structured Query Language. It is the standard language used to communicate with relational database management systems.

WHAT IS SQL? (CONTD..)

Some common relational database management systems that use SQL are: Oracle, Sybase, Microsoft SQL Server, Access, Ingres, etc. Although most database systems use SQL, most of them also have their own additional proprietary extensions that are usually only used on their system.

WHAT IS SQL? (CONTD..)

The standard SQL commands such as "SELECT", "INSERT", "UPDATE", "DELETE", "CREATE", and "DROP" can be used to accomplish almost everything that one needs to do with a database.

HOW SQL IS USEFUL FOR AUDITORS?

- ✓It is English like.
- ✓It is non-procedural.
- ✓It works with almost all RDBMS
- ✓It can accomplish almost all database tasks

CONSTRUCTING 'SELECT' STATEMENT

A minimal SELECT statement asks database engine to fetch some fields from a Table. SELECT statement, like other SQL statements must be terminated by a semi-colon ';' sign. Consider following statement:

SELECT *FieldName1, FieldName2 …*

FROM *TableName;*

CONSTRUCTING 'SELECT' STATEMENT (CONTD...)

Use of WHERE clause in a SELECT statement provides criteria for fetching Records. Syntax of this clause is WHERE FieldName operator Value. Consider following statement:

SELECT *Name, City* FROM *Addresses_Table*

WHERE City = "MUSCAT";

CONSTRUCTING 'SELECT' STATEMENT (CONTD...)

Use of ORDER BY clause in a SELECT statement rearranges data fetched by SELECT statement. Syntax of this clause is ORDER BY FieldName [DESC]. Consider following statement:

SELECT *Name*, *City* FROM *Addresses_Table* ORDER BY *City*;

CONSTRUCTING 'SELECT' STATEMENT (CONTD…)

Use of GROUP BY clause in a SELECT statement GROUPS data fetched by SELECT statement and calculates group variables viz COUNT, SUM, MIN, MAX, AVERAGE ETC. ***NOTE: THAT THIS CLAUSE SHOULD ONLY CONTAIN GROUPED FIELD(S) AND GROUP VARIABLES*** Syntax of this clause is GROUP BY FieldName. Consider following statement:

SELECT *City,COUNT(NAME)* FROM *Addresses_Table* GROUP BY *City*;

CONSTRUCTING 'SELECT' STATEMENT (CONTD...)

Use of HAVING clause in a SELECT statement provides criteria for fetching GROUPED Records. Syntax of this clause is HAVING FieldName operator Value. Consider following statement:

SELECT *City,COUNT(NAME)* FROM *Addresses_Table* GROUP BY *City*

HAVING City = "MUSCAT";

CONSTRUCTING 'SELECT' STATEMENT (CONTD…)

Use of ***Predicate [ALL, DISTINCT, TOP]*** before FieldName(s) of a SELECT statement restricts the number of records returned. If none is specified, the default is ALL.. Consider following statements:

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SELECT TOP 5 MONTHLY_SALES FROM Sales_Table;

SELECT DISTINCT CITY FROM ADDRESSES;
```

QUIZ ON KNOWLEDGE OF SQL SELECT STATEMENT

Time: 20 Minutes.

THANK YOU

```
SELECT NAME, DEPENDENT_NAME,
RELATION FROM  EMPMASTER,
EMPDEPENDENTS
WHERE EMPMASTER.EMPNO =
EMPDEPENDENTS.EMPNO;
```

QUIZ ON UNDERSTANDING OF SQL SELECT STATEMENT

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1	Clause to find out addresses which are outside 'Muscat', 'Matrah' and 'Suhar' cities
(A)	WHERE CITY NOT IN ("Muscat", "Matrah" ,"Suhar")
(B)	WHERE CITY <> "Muscat" AND CITY <> "Matrah" AND CITY <> "Suhar"
(C)	WHERE CITY <> "Muscat" OR CITY <> "Matrah" OR CITY <> "Suhar"
(D)	both 'A' and 'B' above would achieve the desired result.

2	**Employee ID of one Govt Company is structured like 'AC005A20'. Here second character from left ('C' in example) is City Code and fourth/fifth characters (05 in example) are Designation Code. LIKE clause for finding Managers (designation code 07) in city Delhi (code ‘D') would be:**
(A)	LIKE "*D07*"
(B)	LIKE "*D?07*"
(C)	LIKE "?D?07???"
(D)	None of the above.

3	**Select statement for finding names of employees whose salary is more than 10000 and less than 15000.**
(A)	SELECT NAME, SALARY FROM SALARY_DATA WHERE SALARY IN (10000,15000);
(B)	SELECT NAME, SALARY FROM SALARY_DATA WHERE SALARY BETWEEN (10000,15000);
(C)	SELECT NAME, SALARY FROM SALARY_DATA WHERE SALARY BETWEEN 10000 AND 15000;
(D)	SELECT NAME, SALARY FROM SALARY_DATA WHERE SALARY BETWEEN 10000 TO 15000;

4	Select statement for finding names of sales persons and amount of their total annual sale;
(A)	SELECT SALES_MAN_NAME, SUM(SALE_AMOUNT) FROM SALES_DATA GROUP BY SALES_MAN_NAME;
(B)	SELECT SALES_MAN_NAME, SUM(SALE_AMOUNT) FROM SALES_DATA GROUP BY SALES_AMOUNT;
(C)	SELECT SALES_MAN_NAME, SUM(SALE_AMOUNT) GROUP BY SALES_MAN_NAME;
(D)	SELECT SUM(SALE_AMOUNT) FROM SALES_DATA GROUP BY SALES_MAN_NAME;

5	**Select statement for finding name of student(s) who got more than 80 marks in English;**
(A)	SELECT NAME, MARKS, SUBJECT WHERE MARKS > 80 AND SUBJECT = "ENGLISH";
(B)	SELECT NAME, MARKS, SUBJECT FROM EXAMTABLE WHERE MARKS > 80 AND SUBJECT = "ENGLISH";
(C)	SELECT NAME, MARKS, SUBJECT FROM EXAMTABLE WHERE MARKS > 80 IN SUBJECT = "ENGLISH";
(D)	SELECT NAME, MARKS, SUBJECT FROM EXAMTABLE WHERE MARKS >= 80 AND SUBJECT = "ENGLISH";

6	**WHICH of the following must be encapsulated in double-quotes:**
(A)	Dates
(B)	Strings
(C)	Number
(D)	None of the above.

7	WHICH of the following operator is used to show rows where no value has been entered for particular field:
(A)	IS BLANK.
(B)	IS EMPTY.
(C)	IS NULL
(D)	= 0

8	**WHICH of the following is not an aggregate function for SQL SELECT statements:**
(A)	AVG
(B)	MIN
(C)	MAX
(D)	TOTAL

9	**WHICH of the following group variable is used to select largest value from grouped data:**
(A)	MAXIMUM
(B)	LARGEST
(C)	TOP
(D)	MAX

10	'FROM' Clause is used to:
(A)	Specify Table from where rows are to be selected or deleted.
(B)	Specify group of records for displaying data.
(C)	Specify Database from where table is to be selected.
(D)	Specify fields/columns from where data is to be picked.

11	**Which of the following is correct Select Statement.**
(A)	SELECT NAME AND BASICPAY FROM EMPLOYEE_DATA;
(B)	SELECT NAME, BASICPAY FROM EMPLOYEE_DATA;
(C)	SELECT NAME WITH BASICPAY FROM EMPLOYEE_DATA;
(D)	SELECT NAME OR BASICPAY FROM EMPLOYEE_DATA;

12	**In SQL, which command is used for selecting single set of duplicate rows.**
(A)	Select DISTINCT
(B)	Select UNIQUE
(C)	Select DIFFERENT
(D)	None of the above.

13	**Which of the following is a pattern matching operator:**
(A)	Between
(B)	In
(C)	Like
(D)	None of the above is a pattern matching operator.

14	Which query can be used for sorting data in ascending order of age?
(A)	SELECT * FROM empinfo ORDER BY age;
(B)	SELECT * FROM empinfo ORDER age;
(C)	SELECT * FROM empinfo ORDER BY age ascending;
(D)	SELECT * FROM empinfo SORT BY age;

15	**Select a query that retrieves all the unique courses from the student table?**
(A)	SELECT DISTINCT coursename FROM studentinfo;
(B)	SELECT UNIQUE coursename FROM studentinfo;
(C)	SELECT DISTINCT coursename FROM TABLE studentinfo;
(D)	SELECT INDIVIDUAL coursename FROM studentinfo;

16	**The SELECT statement for fetching data from empinfo table where ename is starting with d OR p is .....**
(A)	SELECT ALL FROM empinfo WHERE ename like 'd*‘ OR like ‘p*‘ ;
(B)	SELECT * FROM empinfo WHERE ename is like 'd*‘ OR like ‘p*‘ ;
(C)	SELECT * FROM empinfo WHERE ename like ename like 'd*‘ OR ename like ‘p*‘
(D)	SELECT * FROM empinfo WHERE ename like '[d/p]*';

17	**Which of the following SQL query is correct for selecting the name of employees from 'tblstaff' table whose salary is either 15,000 or 25,000?**
(A)	SELECT sname from tblstaff WHERE salary IN (15000, 25000);
(B)	SELECT sname from tblstaff WHERE salary BETWEEN 15000 AND 25000;
(C)	Both A and B
(D)	None of the above

18	**Which of the following query is correct for using comparison operators in SQL?**
(A)	SELECT sname, coursename FROM studentinfo WHERE age>50 and <80;
(B)	SELECT sname, coursename FROM studentinfo WHERE age>50 and age <80;
(C)	SELECT sname, coursename FROM studentinfo WHERE age>50 and WHERE age<80;
(D)	None of the above

19	SQL
(A)	Structured Query Language
(B)	English-like language for querying a database.
(C)	Non-procedural language
(D)	All the above statements are correct.

20	Query that would group data of male/female employees and tell their Average Salary is:
(A)	SELECT Gender, Average(Salary) FROM EmpData GROUP BY Gender;
(B)	SELECT Name, Average(Salary) FROM EmpData GROUP BY Gender;
(C)	SELECT Average(Salary) FROM EmpData where Gender is male or female GROUP BY Gender;
(D)	None of the above statement is correct.

21	Query SELECT TOP 5 CITY_POPULATION, CITY FROM *Sales_Table* ORDER BY *CITY_POPULATION DESC*; would fetch
(A)	5 CITIES WITH MAXIMUM POPULATION
(B)	5 CITIES WITH MINIMUM POPULATION
(C)	5 CITIES WITH NAMES IN TOP ORDER
(D)	None of the above statement is correct.

22	Query SELECT *City, COUNT(NAME)* FROM *Addresses_Table* GROUP BY *City HAVING count(name) >= 100000;* would fetch
(A)	CITIES WITH POPULATION MORE THAN ONE MILLION
(B)	CITIES WITH POPULATION EQUAL TO OR MORE THAN ONE MILLION
(C)	CITIES WITH MAXIMUM POPULATION
(D)	None of the above statement is correct.

23	Query to find out employees who have attained age of 60 as on 1st Jan 2015 is:
(A)	SELECT NAME, DATE_OF_BIRTH FROM EMPMASTER WHERE DATE_OF_BIRTH > #1/1/55#;
(B)	SELECT NAME, DATE_OF_BIRTH FROM EMPMASTER WHERE DATE_OF_BIRTH < #1/1/55#;
(C)	SELECT NAME, DATE_OF_BIRTH FROM EMPMASTER WHERE DATE_OF_BIRTH between #1/1/55# and #31/12/55#;
(D)	None of the above query is correct.

24	Query to find out employees who are working as ‘Auditor’ is:
(A)	SELECT NAME, Designation FROM EMPMASTER WHERE Designation = #AUDITOR#;
(B)	SELECT NAME, Designation FROM EMPMASTER WHERE Designation = “AUDITOR”;
(C)	SELECT NAME, Designation FROM EMPMASTER WHERE Designation IS “AUDITOR”;
(D)	All the above statements can achieve result.

25	Query to find out maximum salary among ‘Auditors’ is:
(A)	SELECT NAME, Max(Salary) FROM EMPMASTER WHERE Designation = #AUDITOR# and salary = Max(Salary);
(B)	SELECT Designation, Max(Salary) FROM EMPMASTER WHERE Designation = “AUDITOR” GROUP BY DESGNATION;
(C)	SELECT Designation, Max(Salary) FROM EMPMASTER GROUP BY DESGNATION HAVING DISGNATION = MAX(SALARY;
(D)	All the above statements can achieve result.

THANK YOU