

Oracle SQL – L1: Trend.Nxt Hands-on Assignments

Estimated Efforts: 4 PDs

For detailed ToC and other Details: https://wipro365.sharepoint.com/:w:/r/sites/ku-practice-4101/KMSitesContent/GDO/UCF/_layouts/15/WopiFrame2.aspx?sourcedoc=%7B0F26287F-E374-4835-8515-4FC13DEBD438%7D&file=Oracle%20SQL_L1_TOC.docx&action=default

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ToC :

Topic No	Topic Name	Sub-Topics	Min. No of Assignments to be Done
1	Data Retrieval Manipulation	Selecting All Columns Specific Columns Arithmetic Expressions Operator Precedence Concatenation Literal Character Strings	2
2	Data types	Numeric Datatypes Character Datatypes Datetime datatypes BLOB/CLOB datatypes	1
3	Aggregation and Sub-queries	The UNION [ALL], INTERSECT, MINUS Operators SQL For Aggregation	2
4	Creating and Managing DB Objects	Create , Alter ,Truncate , Drop table, Indexes and Sequence	1
5	Data Manipulation	Manipulating Data (DML) INSERT, UPDATE, DELETE, MERGE,	1

		COMMIT and ROLLBACK	
Topic No	Topic Name	Sub-Topics	Min. No of Assignments
6	HQ, DML and DDL Extensions	Hierarchical Queries, Multi table insert External tables	2
7	Advanced SQL	SQL Tuning Overview SQL Statement Processing Basics Explain Plan Basics SQL Trace and TKPROF Basics Indexes and Basic Access Methods Basics Introduction to the Optimizer Basics Optimizer Hints Basics Gathering Statistics Basics	3
Total Min No of Assignments to be Done			12

Table Name : Employee

Column name	Data type	Description
EMPNO	Number	Employee number
ENAME	Varchar	Employee name
JOB	Char	Designation
MGR	Number	Manager's Emp. number
HIREDATE	Date	Date of joining
SAL	Number	Basic Salary
COMM	Number	Commission
DEPTNO	Number	Department Number

Table Name : Department

Column name	Data type	Description
DEPTNO	Number	Department number
DNAME	Varchar	Department name
LOC	Varchar	Location of department

Table Name : Salgrade

Column name	Data type	Description
Grade	Integer	Grade of an Employee
LoSal	Number	Lower Bound of the salary
HighSal	Number	Upper Bound of the salary

Table Name : Member

Column Name	Data Type	Description
Member_Id	Number	Unique Member ID
Member_Name	Varchar	Name of the Library member
Member_address	Varchar	Address of the member
Acc_Open_Date	Date	Date of membership
Membership_type	Varchar	Type of the membership such as 'Lifetime', 'Annual', 'Half Yearly', 'Quarterly'
Fees_paid	Number	Membership fees paid
Max_Books_Allowed	Number	Total Number of books that can be issued to the member.
Penalty_Amount	Number	Penalty amount due

Table Name : Books

Column Name	Data Type	Description
Book_No	Number(6)	Book identification number
Book_Name	VarChar2(30)	Name of the book
Author_name	Varchar2(30)	Author of the book
Cost	Number(7,2)	Cost of the book

Category	Char(10)	Category like Science , Fiction etc.
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Table Name : Issue

Column Name	Data Type	Description
Lib_Issue_Id	Number	Library Book Issue No
Book_No	Number	Number of the book issued
Member_Id	Number	Member that issued the book
Issue_Date	Date	Date of Issue
Return_date	Date	Return date

Table Name : Supplier

Column Name	Data Type	Description
SupplierId	Number	Unique number to identify the Supplier.
SupName	Varchar	Name of the supplier
SupRank	Number	Indicates the star rating of the supplier
SupCity	Varchar	City of the supplier

Table Name : Customer

Column Name	Data Type	Description
CustId	Number	Unique number to identify the customer
CustName	Varchar	Name of the customer
CustIncome	Number	Indicates the annual revenue for the customer
CustType	Varchar	Indicates the type of customer either Manufacturer or WholeSaler or Retailer

Table Name : Shipment

Column Name	Data Type	Description
ShipId	Number	Unique number to identify the shipment
CustId	Number	Used to identify the customer
ShipWeight	Number	Weight of the shipment
ShipDestination	Varchar	Destination city where the shipment has to be dispatched
ShipDate	Date	Date on which the shipment as been packed
VehicleNo	Number	Indicates the vehicle number on which the shipment has been dispatched

Table Name : Vehicle

Column Name	Data Type	Description
VehNo	Number	Unique number to represent the vehicle
VehDriver	Varchar	Driver name of the vehicle
DriverCity	Varchar	City of the Vehicle Driver

Topic 1: Data Retrieval manipulation

Assignment : 1

- List the number of employees and average salary for employees in department 20.
- List name, salary and PF amount of all employees. (PF is calculated as 10% of basic salary).
- List the name and job of the employee whose manager id is null.
- List the name, employee number, job, hiredate of all the employees who are managers.
- List the empno, ename, sal of all employees who reports to the managerid = 7369.
- List the employees whose job is either "Clerk" or "Trainer".
- Display all the employees whose salary is between 10000 and 20000.
- List the names of the employees who are not eligible for commission.
- Display all the employees whose name either starts or ends with 'H'.
- List the details of the employees in ascending order of salary.
- List the employees who are not part of the department number 10, 20 or 30.
- List the employee details (empno, ename, AnnualSalary) of the employees who are part of the department number 10. [Note.: AnnualSalary = sal * 12].

Assignment : 2

- List all the books that are written by Author Loni and has price less than 600.
- List the Issue details for the books that are not returned yet.
- List all the Issue details that have books issued for more than 30 days.
- List all the books that have price in range between 500 to 750 and has category as Database.
- List all the books that belong to any one of the following categories Science, Database, Fiction, Management.
- List all the members in descending order based on Penalty_Amount.
- List all the books in ascending order of category and descending order of price.
- List all the books that contain word SQL in the name of the book.
- List all the members whose name starts with 'R' or 'G' and contains letter 'I' in it.
- List the entire book name in Init cap and author in upper case in the descending order of the book name.
- List the issue details (Issue_date and Return_date) for all the books which are issued to member_id 101 in the following format '<Day> <Month>, <Date> , <Year>'.
- List the member details who are all members since 2001.

Assignment : 3

- Display no of months between issue date and return date for all issue
- Display the length of member's name
- Display the first 5 characters of membership_type for all members
- Display the last day of the issue date
- Using the regular expression function select name of book beginning with L.

- f. List all the members whose member_name starts with 'R'.
- g. List the book_name which contains the word 'SQL'.
- h. Replace the book_name "Mastering Monogo DB" with "Advanced Mongo DB" using regular expression.
- i. List the book_name which contains 'G' from position 1 to 5 using regular expressions.
- j. List the issue details (Lib_Issue_Id, Issue_Date, Return_Date) and calculate the no of days the book was issued.
- k. Display the total penalty due for all the members.
- l. List the details of the members in ascending order based on Acc_Open_Date.

Topic 2: Data Types

Assignment : 1

- a. Identify the difference between sal NUMERIC and sal NUMBER(10,2).
- b. State the difference between name CHAR(48) and name VARCHAR(48).
- c. State the difference between CHAR, VARCHAR2 and CLOB datatypes in oracle.
- d. List the valid datatypes which are used to create variables in SQL * PLUS.
- e. Specify the usages of CLOB and BLOB datatypes in Oracle.
- f. Which datatype is used to store both the date and time to a column in oracle.
- g. What is the default format for the DATE type.
- h. Write a command to change the date format as 'MMM DD YYYY'.
- i. Identify the difference between NUMBER and BINARY_FLOAT.
- j. Specify the usage of BFILE.

Assignment : 2

- a. Differentiate between CHAR and NCHAR.
- b. List all the numeric types available in ORACLE.
- c. Differentiate between DATE and TIMESTAMP.
- d. Differentiate between BLOB and BFILE.
- e. Differentiate between INTEGER and SMALLINT.
- f. State the difference between empNo INTEGER and empNo NUMERIC.
- g. Which type is used to store only the date.
- h. Identify the difference between LONG and RAW types.
- i. Differentiate between VARCHAR2 and NVARCHAR2.
- j. When to use CLOB and BLOB datatype.

Topic 3: Aggregation and Sub-Queries

Assignment : 1

- a. List the number of employees working with the company.
- b. List the number of designations available in the Employee table.
- c. List the total salaries paid to the employees.
- d. List the maximum, minimum and average salary of the employees.
- e. List the maximum salary paid to Salesman.
- f. List the driver details who have delivered shipment to the customers whose annual revenue is > 12 Lakhs.

- g. List the name and annual revenue of customers whose shipments have been delivered by truck driver named 'Baskar'.
- h. List the customers who have shipments delivered by every truck. (Use Not Exists).
- i. List the customers who have an annual revenue > 5 Lakhs , sent shipments weighing > 100 Kgs or sent a shipment to 'NewDelhi'.
- j. List the vehicle details which has delivered the maximum number of shipments.

Assignment : 2

- a. Display the total number of members.
- b. Display the total number of books issued.
- c. Display the average membership fees paid by all the members.
- d. List the book_no of all the books that are not issued to any member so far.
- e. List all the member id that exist in member table and has also at least one book issued by them.
- f. List the member id with highest and lowest number of books issued.
- g. List all the Book_no, Book_name for all the books that are issued in the month of either June or December without using arithmetic, logical or comparison operator.
- h. List the BookNo, BookName, Issud_Date and Retrun_Date for all the books issued by Stalin.
- i. List all the books that have highest price in their own category
- j. List all the members where no of books issued exceeds the maximum number of books allowed.

Assignment : 3

- a. Display unique Jobs from EMP table.
- b. List the details of the employees whose salary is more than the employee BLAKE.
- c. List the employees whose jobs are same as ALLEN.
- d. List the employees who are senior to KING.
- e. List the employees who are senor to their own MGRS.
- f. List all employees whose department and designation is same as that of employee with empno 7788.
- g. List all employees who earn more than the average salary in their department
- h. List employees who have joined after Adam
- i. Write a query to display the nth maximum salary.
- j. List the count and average salary for employees in department 20.

Topic 4: Creating and Managing Database objects

Assignment : 1

- a. Create new table *empcopy* and copy all records of employee table.
- b. Create a new table *deptcopy* and copy only the schema of department table.
- c. Create Index on Book_Name in Book table.
- d. Create Index on Member_ID , Book_No in Issue table.
- e. Modify the table Member by increasing the width of member name to 48 characters.
- f. Add a new column Reference CHAR(30) to Issue table.
- g. Rename the table Issue to Lib_Issue.

- h. Drop the column Reference from Issue table.
- i. Add constraints to the Member table on columns Max_Books_Allowed and Penalty_Amount as Max_Books_Allowed < 100 and Penalty_Amount <= 1000.
- j. Create 2 sequences to auto generate the values for Member_ID and Supplier_ID column in Member and Supplier tables respectively.
- k. Create a sequence no_seq of even numbers starting with 100 and ending with 200.
- l. Drop the above created sequence.
- m. Create a sequence book_seq starting with 101 and ending with 1000 and incremented by 1 without cycle.
- n. Create a sequence member_seq starting with 1 and ending with 100 and incremented by 1 without cycle.
- o. Drop the above created sequences.

Topic 5: Data Manipulation

Assignment : 1

- a. Insert at least 15 valid rows in EMPLOYEE table
- b. Update salary by 10% for employees in deptno 10 and 20
- c. Update salary and commission by 10% and 2% for all employees for whom commission is currently applicable.
- d. Update the designation of given employee to MANAGER based of given employee number.
- e. Delete the employee who have joined before the given year.
- f. Try to insert a record with Max_Books_Allowed = 110, Observe the error that comes. Report the reason for this error.
- g. Write a query to copy only the records from Book table to NewBook table.
- h. Save all the data so far you have inserted.
- i. Insert data in Book table as follows:

Book_No	Book Name	Author	Cost	Category
1000	MongoDB	Allen	750	Database
1001	Python 3	Magret	1350	AI
1002	Angular 4	Google	2750	UI
1003	PL SQL-Ref	Scott Urman	750	Database

- j. Insert 5 records to the employee table dynamically.
- k. Undo the last changes.
- l. Modify the book with id 1003 to Price= 300 and Category = OracleDatabase.
- m. Perform a save point T.
 - Remove all the records from Issue table where member_ID is 1 and Issue date in before 10-Dec-06.
 - Remove all the records from Book table with category other than RDBMS and Database.
 - Undo the changes done after savepoint T.
- n. Save all the changes done before T.

Topic 6: HQ and DML, DDL Extension

Assignment 1:

Write a Query to generate hierarchical output. You can use EMPLOYEE table of HR schema and start with employee where manager_id is null

Assignment 2:

Create External Table to read data from a CSV file. Choose any structure of your choice – ensure you have data of type – number, varchar and date type.

Assignment 3:

Write a Multitable INSERT statement to select data from employee table and insert into SAL_HISTORY table (columns – empid, hiredate, salary) and MGR_HISTORY table (columns – empid, mgr_id, hiredate)

Topic 7: Advanced SQL.

Assignment 1:

Generate execution plan for the below query (use HR schema) and explain the order in which the steps gets executed and all columns of the execution plan – Operation, Rows, Bytes , Cost

```
select e.employee_id,e.first_name,d.department_name
from hr.employees E, hr.departments D
where e.department_id = d.department_id
```

Alter your session set optimizer_mode = first_rows ; rerun the above query and get execution plan – is there any change in execution, interpret the plan.

Assignment 2:

Enable SQL tracing at the sessions level. Execute many SELECT and DML statements, disable sql tracing.

Generate TKPROF report the trace file and interpret the report

Assignment 3:

Gather optimizer statistic on EMPLOYEE Table of HR schema with individual histograms on MANAGER_ID, SALARY columns and extended histogram on (DEPARTMENT_ID, JOB_ID)

Assignment 4:

The below query does a FTS and filter

```
SELECT * FROM EMPLOYEES WHERE MANAGER_ID IS NULL;
```

Create required indexes and make necessary changes to the Query to avoid FTS and go for Index Range Scan

