

VASAVI COLLEGE OF ENGINEERING

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(Affiliated to Osmania University)

Hyderabad - 500 031.

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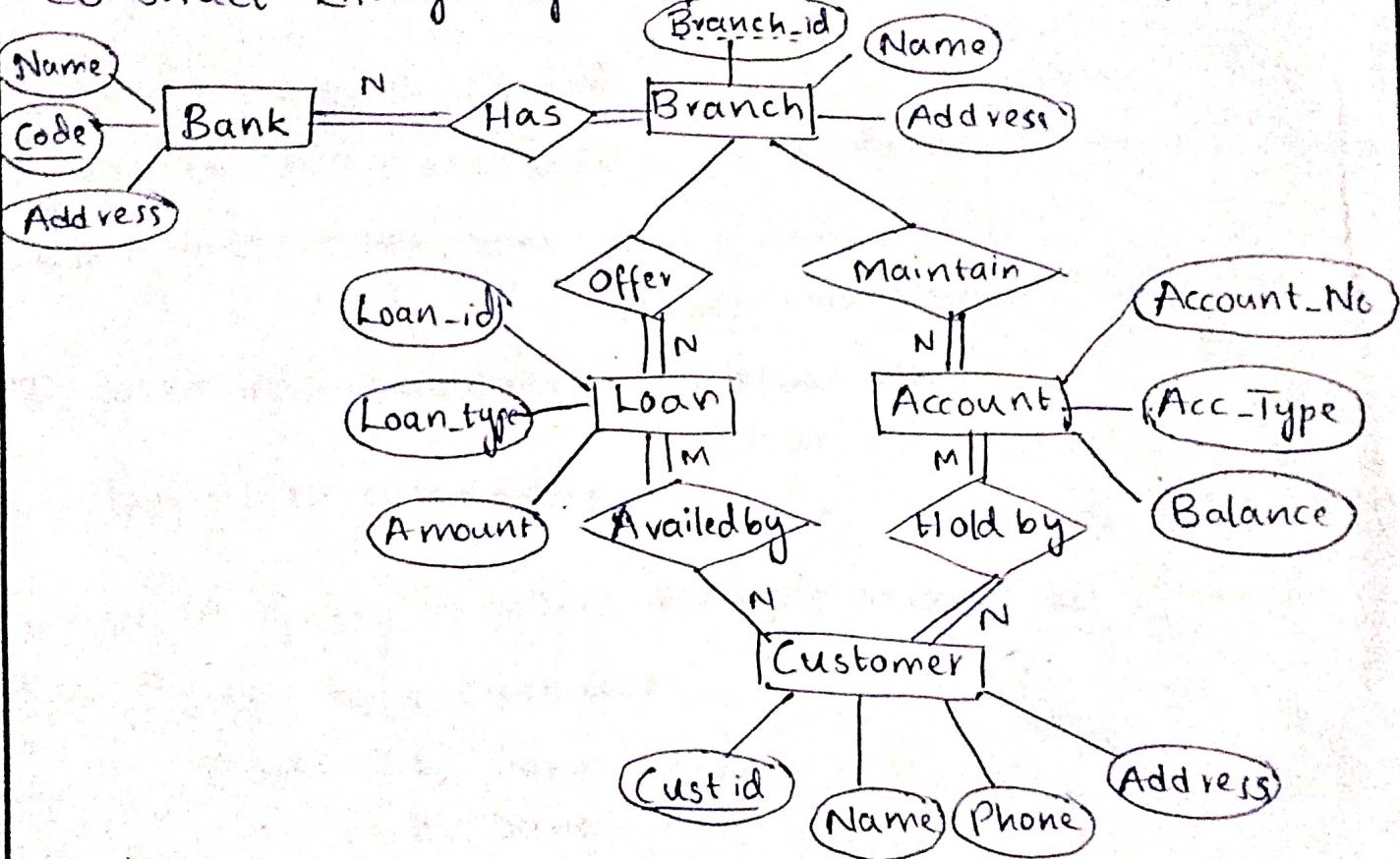
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DBMS Prelab-1 :

1

Construct Entity diagram for bank in a bank application



2

Write a program to create a relation.

Syntax to create a relation (table) in SQL :

```
Create TABLE table_name (column1 datatype,  
                      column2 datatype,  
                      ...  
                     );
```

Ans

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eg: create table customers (ID Number, Name Varchar(50),
Age Number);

(3) Write a program to add a record in database.

Ans Syntax to add a record (row) to a database table in SQL:

insert into table_name (column1, column2, ...)
values (value1, value2, ...);

eg: insert into customers (ID, Name, Age)
values (2, 'John', 30);

(or) insert into customers values (2, 'John', 30);

(4) Write a query to insert multiple records in sql.

Eg: insert into customers
values (1, 'John', 30),
(2, 'Jane', 25),
(3, 'Mike', 35);

(5) Write a command to rollback which undo the process.

Ans The roll back command is used in transactions to revert any modifications made since the transaction began.

Syntax: **ROLLBACK;**

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Eg: To illust

BEGIN TRANSACTION;

- perform some modifications (insert, update, ^{delete} modify)
- If there's an issue or we want to rollback, execute;

ROLLBACK;

- If changes are intended, execute;

COMMIT;

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DBMS Prelab-2

- ① Write a query to find the employee name whose name starts with 'K'.
 * Select ename from emp where ename like 'K%';
- ② Differentiate Primary key & Foreign key with an example.

Primary Key	Foreign Key
★ A column or set of columns in a table that uniquely identifies each record in that table	★ Column or set of columns that refers to primary key of another table.
★ It ensures the uniqueness and integrity of the data within the table	★ It establishes a relationship between two tables based on their key attributes
★ <u>Ex:</u> In a table "Student" with StudentID (primary key), Name & Age. StudentID uniquely identifies each student in the table	★ In a table named "Courses" with attributes, CourseID (primary key), CourseName and StudentID (foreign key). StudentID in 'Courses' refers to StudentID in 'Students' table

StudentID	Name	Age
1	John	20
2	Jane	22
3	David	19

CourseID	CourseName	StudentID
101	Math	1
102	Science	2
103	History	3

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- ⑤ Write a query to find the data in ascending order of employee table

select * from emp order by ename asc;

- ④ Write a query to find the average salary of an employee.

select avg(sal) as average-salary from emp;

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DBMS Prelab-3

① Differentiate the SQL operations with examples.

(i) Between (ii) In (iii) Like (iv) Distinct :

Ans (i) Between : to retrieve values within a specified range

ex: select * from emp where ~~age~~ ^{sal} between 1000 and 2000;

(ii) In : to check if a value matches any value in a list or subquery

ex: select * from emp where deptno in (10, 20);

(iii) Like ; to perform two pattern matching on strings

ex: Select * from emp where ename like 'S%';

(iv) Distinct : to return unique or distinct values from a column

ex: select distinct sal from emp;

② Differentiate Weak and Strong entity set? Represent with diagram.

* Weak entity set cannot be uniquely identified by its attributes alone. It depends on the existence of a related strong entity set for identification. While, a strong entity set can be uniquely identified by its attribute, without relying on any other entity set.

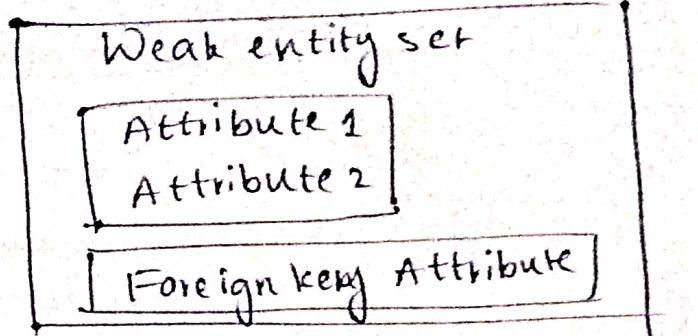
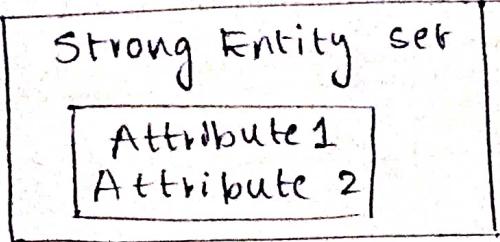
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* In weak entity set, foreign key attribute is present that references to the strong entity set for identification.

③ Write queries on set operators.

(i) Union: Combines 2 or more select statements & remove duplicates

(select deptno from emp) union (select deptno from another -table)

(ii) Intersect: Common rows b/w 2 select statements

(select ename from emp) intersect (select ename from another -table)

(iii) Minus / Except: rows in first select statement that are not present in 2nd select statement.

(select ename from emp) minus (select ename from another -table)

④ Write a query to view the records of a table.

Syntax : select * from table_name;

ex : select * from emp;

To select particular records we could use 'where' statement with a condition.

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PRELAB QUESTIONS -4 :

- 1) Write a query on group by clause?
→ select department, count(*) as employee-count from employees group by department;
- 2) Differentiate the following string function with examples:
(i) substr (ii) instr (iii) trim (iv) rpad.
(i) substr → used to extract a portion of string based on specified starting position and length.
(ii) instr → used to find the position of a substring within a string. It returns the position of first occurrence of the substring.
(iii) trim → used to remove specified characters from the beginning or end of a string.
(iv) rpad → used to right pad a string with specified character until it reaches a specified length.
- 3) Write a query on date functions with syntaxes:

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1) CURRENT_DATE:

Select CURRENT_DATE as current_date;

2) CURRENT_TIMESTAMP:

Select CURRENT_TIMESTAMP as current_timestamp;

3) DATEADD:

Select DATEADD(interval,value,date) as new_date;

4) DATEDIFF:

Select DATEDIFF(interval,start-date,end-date)
as difference;

5) EXTRACT:

Select EXTRACT(part FROM date) as
extracted_value;

4) How to specify alias names to columns give one example?

→ Select column_name AS alias_name from
table_name;

PRELAB QUESTIONS-5:

1) Write a query to merge 2 tables using joins:

dname,

→ select empno, ename, deptno, _n from emp

natural join dept

2) Write a query using correlated query

→ select order-id, order-date, customer-id

from orders o where exists (select 1

from customers c where c.customer-id

= o.customer-id AND c.country = 'USA').

3) Differentiate between relational algebra and
relational calculus:

→ Relational algebra is a procedural query language
that defines a set of operations to manipulate
relational data. It focuses on the mathematical
and transformations applied to relations or
tables.

→ Relational calculus is a non-procedural language
that defines the desired result without

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specifying the sequence of operations to obtain it.

It focuses on describing what data should be retrieved rather than how to retrieve.

Q) Differentiate projection and selection with examples

→ Projection is an operation that retrieves specific columns from relation while discarding remaining columns.

Ex: $\Pi_{empid, sal}(\text{emp})$;

→ Selection is an operation that retrieves specific rows from a relation that satisfy a given condition

Ex: $\sigma_{age < 30}(\text{emp})$.

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PRELAB QUESTIONS-6:

- 1) Differentiate the 3NF and BCNF.
→ 3NF is a level of database normalization that estimates transitive dependencies with a relation.
In 3NF, every non-key attribute must depend on the candidate keys of the table.
- BCNF is a level of normalization that eliminates all non-trivial functional dependencies with a relation.
- 2) Differentiate the trivial and non-trivial FDs?
→ A trivial functional dependency is a dependency where the right hand side is a subset of the left hand side.
→ Non-trivial functional dependency is a dependency where the right hand side is not a subset of the left hand side.
- 3) Write a query to display each institute name with no. of students.

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Select i.institute-name, count(s.student_id) as
student_count from Institutes i join Students s
ON i.institute_id = s.institute_id group by
i.institute-name;

- 4) Write a query to find the distinct student ids in
the student relation.

Select distinct student_id from student;

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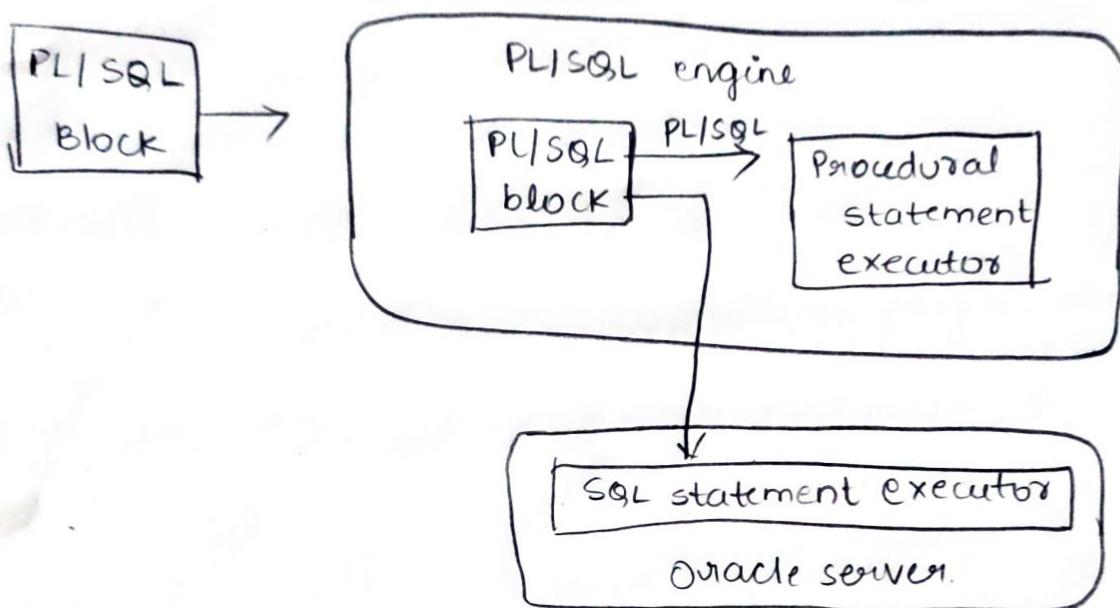
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PRE-LAB-7

- 1) Write about PL/SQL execution environment.



The execution environment has mainly 5 components.

1. Oracle database server
2. PL/SQL compiler
3. Runtime Engine
4. Memory and session management
5. security and access control.

- 2) Construct various sections of PL/SQL block?

1. Declaration block

variables used in program are declared here

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BEGIN

executable sections containing PL/SQL statements

EXCEPTION

statements for dealing with errors

END;

/

- 3) Write a query using %rowtype in PL/SQL block?

declare

emp-rec employees%ROWTYPE;

begin

select * into emp-rec from emp where eno=100;

dbms_output.put_line ('Employee ID : ' || emp-rec.eno);

dbms_output.put_line ('First Name : ' || emp-rec.firstname);

end;

/

- 4) Write a query using % type in PL/SQL.

DECLARE

emp-id employees.employee_id%TYPE;

BEGIN

emp-id := 100;

SELECT salary INTO emp-salary from employees where

dbms_output.put_line ('Employee ID : ' || emp-id);

END;

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Prelab-8

- ① Distinguish Procedure and functions.

Procedures	functions
→ Does not have a return value.	→ must have a return value.
→ cannot be used within expressions	→ can be used within expressions
→ Typically called using CALL Statement or directly referencing the name.	→ called within an expression or SQL statement.
→ Performs actions or modifies data.	→ computes and returns a specific output value.

- 2) How to create a procedure and a function.

Procedure creation: Create [or replace] procedure

procedure-name [(parameter_1 [IN|OUT|IN OUT] datatype, ...)]
[IS | AS]

Function Creation:-

Create (or replace) function function-name [(parameter_1 [IN|OUT]
NOUT] datatype,)] return return_datatype [IS | AS]

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- 3) How to drop a stored procedure.

Syntax to drop a stored procedure:

drop procedure procedurename;

- 4) Construct the Nested query with IN operator?

Select ename from emp where deptno IN (select
deptno from dept where deptno IN (10,20,30));

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Pselab - 9

- 1) Differentiate explicit and Implicit cursors

Explicit cursors	Implicit cursors
<ul style="list-style-type: none">→ These are explicitly declared using the 'CURSOR' Keyword→ you have complete control over explicit cursors and need to manually perform operations like opening, fetching and closing cursor <p>Syntax :-</p> <pre>CURSOR cursor-name IS SELECT column1, column2 from table-name;</pre>	<ul style="list-style-type: none">→ Implicit cursors are not explicitly declared. They are automatically created by oracle whenever any SQL statement is executed..→ You don't have direct over implicit cursors. Oracle manages their lifecycles.→ These are convenient for simple queries. <p>Syntax:</p> <pre>select column1, column2 INTO variable1, variable2 from table-name;</pre>

- 2) Write a PL/SQL program using implicit cursor attributes

DECLARE

```
v-employee-id employees.employee-id %TYPE;  
v-first-name employees.first-name %TYPE;  
v-salary employees.salary %TYPE;
```

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BEGIN

```
select employee_id, first_name, salary INTO v_employee_id,  
v_first_name, v_salary from employees where dept_id = 10;  
dbms_output.put_line('Employee ID: ' || v_employee_id);  
dbms_output.put_line(' FirstName: ' || v_first_name);  
dbms_output.put_line(' salary: ' || v_salary);
```

EXCEPTION

```
when no_data_found then  
dbms_output.put_line('No data found:');  
when others then  
dbms_output.put_line('An error occurred: ' || SQLERRM);
```

end;

/

- 3) How do you declare a parameterized error ?

DECLARE

```
TYPE cursor_type IS REF CURSOR;  
dep_id dept.dept_id%TYPE := 10;  
v_cursor cursor_type;  
emp_id emp.empno%TYPE;  
ename emp.ename%TYPE;
```

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Salary emp. sal %TYPE;

BEGIN

Open v-cursor FOR Select emp_id, name, salary from emp
where ~~dept_id~~ ~~dept_id~~ dept_id = dep_id ;

for emp IN v-cursor loop

emp_id := emp.emp_id;

name := emp.ename;

salary := emp.sal;

dbms_output.put_line('Employee ID:' || emp_id);

dbms_output.put_line('First Name:' || name);

dbms_output.put_line('Salary:' || sal);

dbms_output.put_line('END');

end loop;

closev_cursor;

END;

/

4) Write the steps involved in using a explicit cursor.

1. Declare the cursor variable, specifying the select statement that defines the result set to be fetched.

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- 2 • Declare variables to store the fetched data, compatible with the data types of the columns being selected.
- 3 • Open the cursor and associate it with the result set.
- 4 • Use the fetch statement to retrieve the next row from the cursor's result set and assign the values
- 5) Close the cursor to release resources.

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DBMS Poelab - 10

- 1) Which sql statement can be used in triggers .

In sql , various statements can be used within triggers to perform specific actions when certain events occur.

We can use 1. Insert trigger , 2. UPDATE trigger ,
3. Delete trigger 4. SELECT trigger.

- 2) Differentiate before and after triggers.

Before Trigger

→ Executed before the event is triggered.

→ They allow you to perform actions or validations before the actual operation is performed on the table

After trigger

→ Executed after the event is triggered .

→ They allow you to perform actions based on the changes made by the triggering event .

- 3) How do you delete a trigger .?

Syntax : DROP TRIGGER trigger-name;