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Assignment No. 1

Assignment Topic: Data models

1. Define Data model? Explain types with examples?

Data Models:-

It defines the design of a database.

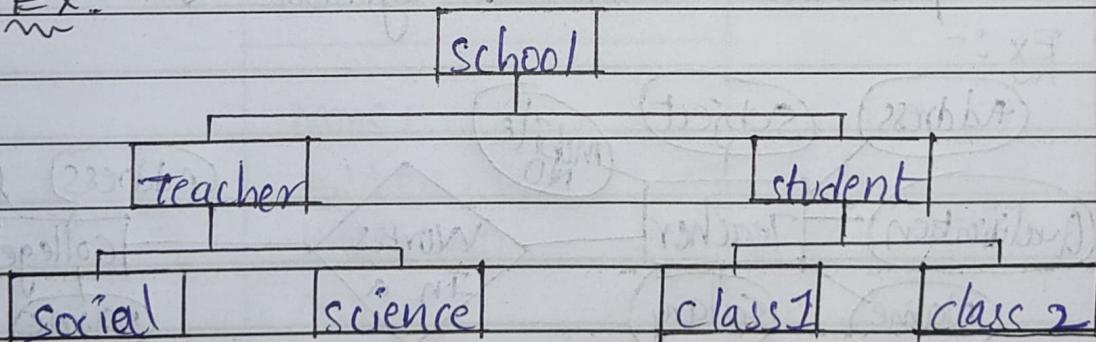
There are 5 types of Data models.

1. Hierarchical Data model
2. Network Data model
3. Entity Relationship Data model
4. Relational Data model
5. Object oriented Data model

1. Hierarchical Data model:-

It represents the data in pre-structure. It follows one to many relationship. The condition of this Data model is one parent can contain more than one children, but one children can contain only one parent.

Ex:-

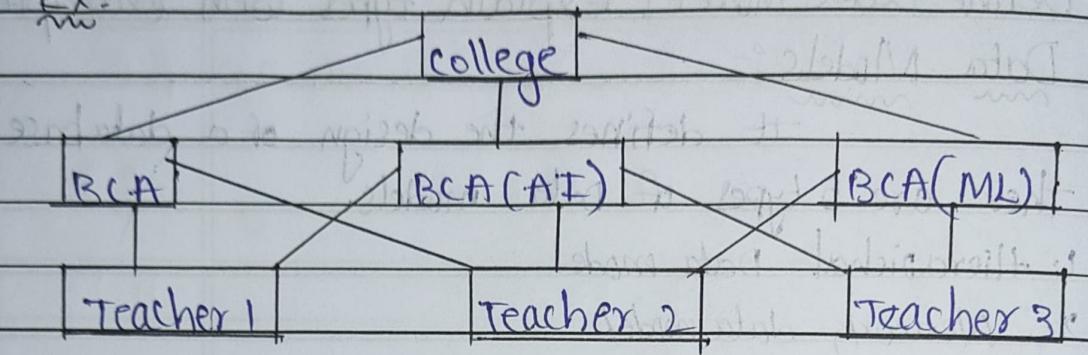


2. Network Data model :-

It represents the data in graph structure. It follows many to many relationship.

The condition is one parent can have more than one children and also one children can have more than one parent.

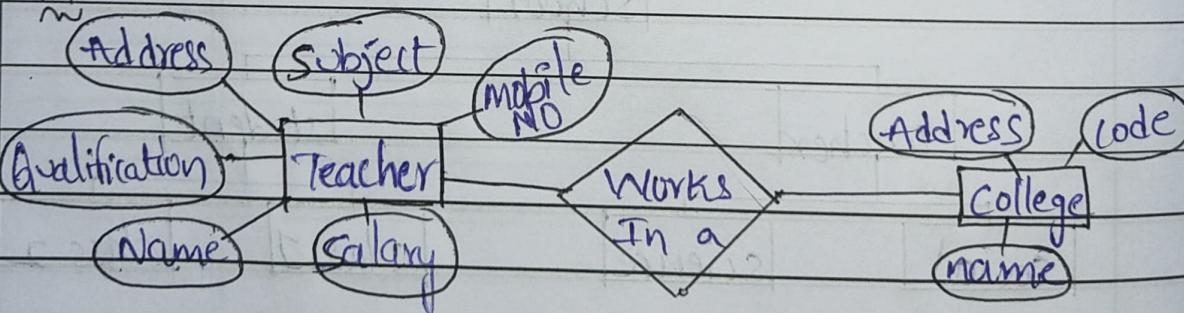
Ex:-



3. Entity Relationship Data model :-

It is also known as ER Model. It contains Entity, Attributes & Relationship. Entity is a real world object. It may be a person, place, thing etc.. It is represented in Rectangle symbol " $\boxed{\quad}$ ". Attributes defines the properties of an entity, it is represented in oval symbol " \circlearrowleft ". Relationship is used to connect the two entities, it is represented in rhombus symbol " \diamond ".

Ex :-



4. Relational Data Models :-

It is also known as RDBMS. The Data is represented in tables. Tables

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contains rows and columns. Rows are known as tuples. Column headers are known as Attributes. Each table must contain table name. Tables are also known as Relation.

Ex:-

Student			Relation
Tuples	ID	Name	Attributes
1		Sethu	BCA
2		Vardhan	BCA(AI)

5. Object oriented data models :-

object is a person, place, thing etc...

Each object contains data and method.

Ex:-

	Student	object
	name,	
	Address,	data
	Mobile.NO,	
	course	
	read(), write()	methods

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Assignment No. 2

Assignment Topic : File system vs Data Base System

2. File system Vs DataBase System approach?

File system

1. The file system is a built software that manages and organises the files in the computer

2. redundancy of data is present in file System

3. There is no effective query processing

4. Data is distributed in many files so that sharing the data is not easy

5. There is less data consistency

6. It is less complex as compared to database system

7. It is less expensive

Database System

1. DBMS is a user defined software that is used for managing and storing the data.

2. There is no data redundancy

3.

3. Effective query processing is present in DBMS

4. Due to centralized data, sharing is easy

5. There is more data consistency.

6. It is more complex in handling the data when compared to file system

7. It is more expensive.

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Assignment Topic : Keys in RDBMS

3. Define Keys? Explain the types of keys.

Keys:-

Key is an attribute or set of attributes that are used to identify unique no. of tuples in a relation. There are 4 types of keys, they are

1. primary key

2. super key

3. candidate key

4. Foreign key.

1. Primary Key:-

It is a first key used to identify particular rows in a table. It doesn't accept duplicate values and none values. It can't be changed in any time.

Ex:-

H.T.NO	Name	age
8220	sethu	18
8221	Vardhan	19

In the above example H.T.NO is the primary key.

2. Super Key:-

It is a combination of key

attribute & non-key attribute

Ex:-

Student

HT. NO	Name	Marks	Super Keys :-
8220	sethu	75	{ HT. NO, name }
8221	vardhan	76	{ HT. NO, marks }
8222	mahendra	78	

3. Candidate key :-

Except primary key remaining key attributes are candidate keys. The values in candidate key are may or may not be changed.

Ex:-

HT. NO	Name	Marks	mobile.NO	Email
8220	sethu	75	79935	sethu@gmail.
8221	vardhan	76	79936	vardhan@gmail

In the above example mobile-number & email are the candidate keys, because a person can change their mobile.NO, Email ID at any time.

4. Foreign key :-

It is used to create a relationship between two tables. It contains duplicate values.

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$E_{x'}$ -

Primary Key
↑ Person

↑ Person

Person	Name
Id	
3D4	sethu
305	vardhaman
306	mahendra

Primary Key

Product

Foreign Key

product	Name	person
7d		Id
1288	Rice	304P
1289	oil	304
1290	sugar	305
1291	salt	306

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Assignment Topic : Normal forms

4. Define Normalization & Explain the different types of Normal Forms with an Example?

A) Normalization :-

The process of dividing the large tables into smaller tables is known as Normalization. It is implemented by using different normal forms. With the help of normal forms we can arrange the data in a standard tabular format.

The types of normal forms are

1. 1NF (first normal forms) - ✓
2. 2NF (second normal forms)
3. 3NF (Third normal forms)
4. ~~4NF~~ BCNF (Boyce-codd normal forms)

First Normal form (1NF) :-

It is also known as 1NF.

This normal form defines each cell in a table must contain only single value.

Ex:-

Before 1NF

Id	Name	mobile-NO
1	sethu	7993588220,
2	Vardhan	8996720221
3	Nithin	3261027161

After 1NF

Id	Name	mobile NO.
1	Sethu	7993588220
2	Vardhan	8996720221
2	Vardhan	3261021161

2. Second Normal Form (2NF) :-

It is also known as 2NF.

This normal form defines there is no partial functional dependency. & every table must contain only one primary key.

Before 2NF

Emp Id	Emp name	Address	Dept Id	Dept - name
123	Sethu	Tpt	001	ABC
321	Vardhan	plm	002	MNR

After 2NF

Employee			Department	
Emp Id	Emp name	Address	Dept Id	Dept - name
123	Sethu	Tpt	001	ABC
321	Vardhan	plm	002	MNR

3. Third Normal Form (3NF) :-

It is also known as 3NF. This normal form defines every relation must contain only one primary key & there is no transitive dependency.

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College code	College name	Principle name
012	ABC	Sethu
013	DEF	Vardhan

College code	College name	College code	Principle name
012	ABC	012	Sethu
013	DEF	013	Vardhan

4. Boyce-Codd Normal form :-

It is also known as BCNF. It is an advanced version of 3NF. It is mainly used in large databases. The rules are similar to 3NF.

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Assignment Topic : ER model & its components

5. Define ER model? Explain the components of ER model?

A) It was developed by Peter Chen in 1976. The ER diagram explains the relationships among entities present in the database.

These are 3 components of an ER model they are

1. Entities

2. Attributes

3. Relationships.

1. Entities :-

The entity is a real world object it may be a person, place, thing etc. It is represented by using rectangular symbol 

There are two types of entities they are

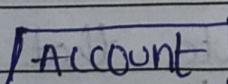
1. Strong entity

2. Weak entity

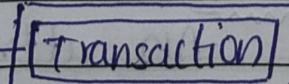
* Strong entity is an independent object and weak entity is a dependent object.

* Weak entity is denoted by  double rectangle symbol.

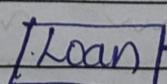
Ex:-

 Account

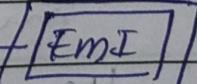
Strong entity

 Transaction

Weak entity

 Loan

Strong entity

 EMI

Weak entity

2. Attributes :-

It defines the properties of an entity. It is denoted by using ellipse (oval) symbol . There are 4 types attributes. They are.

1. Key attribute

2. Composite attribute

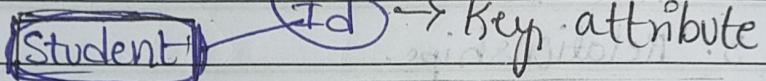
3. Multivalue attribute

4. Derived attribute

1. Key Attribute :-

An attribute that contains unique values is known as key attribute.

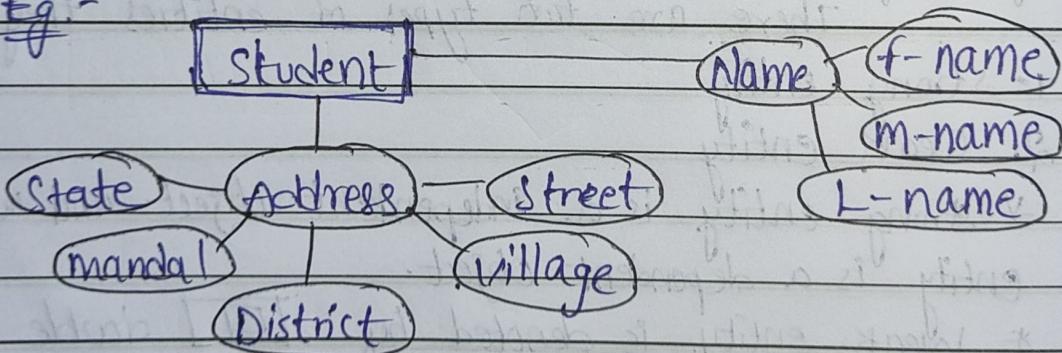
Ex:-



2. Composite Attribute :-

An attribute containing combination of other attributes is known as composite attribute.

Eg:-



In the above example :-

'name & address' are the composite attributes.

3. Multivalue Attribute :-

An attribute that stores multiple values is known as multivalue.

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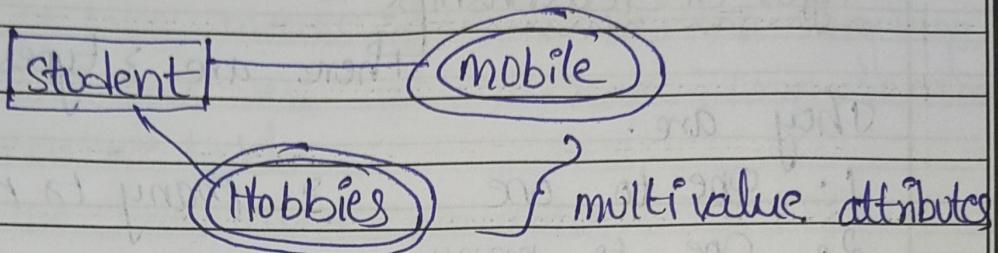
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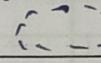
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attributes. It is represented by using double ellipse symbol .

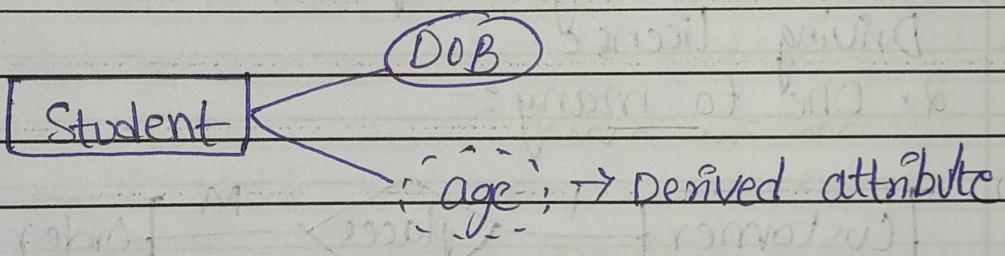
Eg:-



4. Derived attributes :-

An attribute is derived from another attribute is known as derived attribute. It is represented by using dashed ellipse .

Eg:-



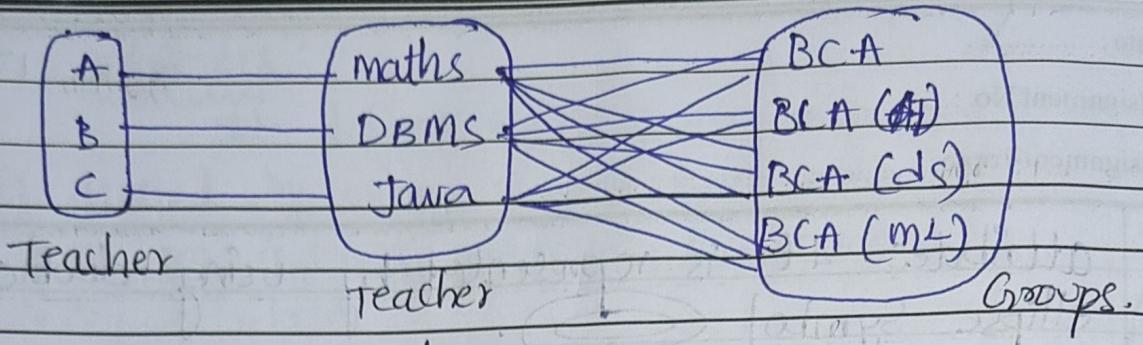
5. Relationship:-

It is used to connect two entities. It is represented by using rhombus symbol .

Relationship set :-

It defines set of relations of same type.

Teachers.



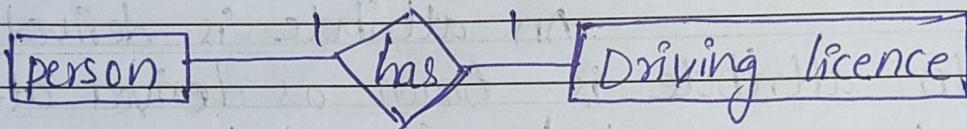
Types of relationships :-

There are 3 types of relationships

They are.

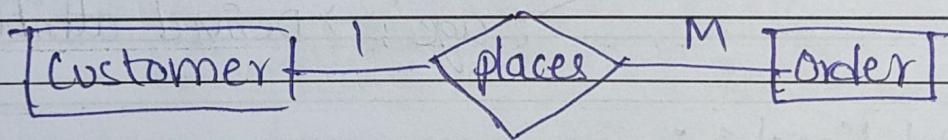
1. One to one
2. One to many
3. Many to many

1. One to one :-



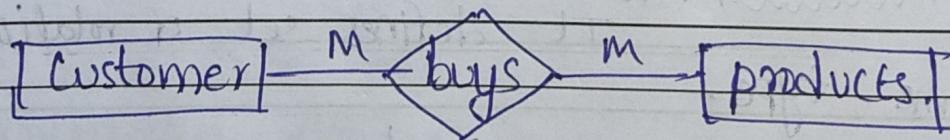
In the above eg one person contains only one Driving license.

2. One to many :-



In the above example, one customer can place many orders.

3. many to many :-



In the above example, many customer buys many products.

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Assignment Topic : DDL & DML commands

Q. Explain DDL & DML commands with an example?

A) DDL Command :-

→ DDL means Data definition language

2. These commands are used to create, drop, rename, alter, truncate tables.

3. These are autosaved commands.

The types of commands are

1. Create 4. Truncate

2. Alter 5. Rename.

3. Drop

1. Create :-

It is used to create a new table in the database

Syntax:-

create table tablename (column names
data types);

Ex:-

create table ^{Sethu}tablename (id int, name varchar(20), marks
int);

2. Alter :-

It is used to changing the structure of a table. The change may be either adding a new attribute or dropping a attribute.

Syntax:-

1. Alter table tablename add columnname datatype;

2. Alter table tablename drop column column name;

Ex:-

1. Alter table sethu add mobile_num int;

2. Alter table sethu drop column marks;

3. Drop :-

It is used to remove the entire table along with data in a database.

Syntax:-

Drop table tablename;

Ex:-

drop table sethu;

4. Truncate :-

It is used to remove the all rows in a table but not the entire structure of a table.

Syntax:-

Truncate table tablename;

Ex:-

Truncate table sethu;

5. Rename :-

It is used to change the table name

Syntax:-

Rename oldtablename to newtablename;

Ex:-

Rename sethu to BCA;

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DML commands:

DML means Data manipulation language. the types of DML commands are

1. Insert

2. Update

3. Delete.

1. Insert:-

It is used to add new data in a table.

Syntax:-

insert into tablename values (value1, value2 ..);

Ex:-

insert into bca values (1, 'sethu', 786534);

2. Update:-

It is used to modify row data in a table based on where condition.

Syntax:-

update tablename set column name = value
where condition;

Ex:-

update bca set name = 'vardhan' where id=1;

3. Delete:-

It is used to remove the rows in a

table based on where condition.

Syntax:-

Delete from tablename where condition;

Ex:-

delete from bra where id=1;

Q. Define joins & Explain the types of joins in SQL?

A) Joins:-

Join is a SQL operation that combines data from two tables based on related column. It allows you to merge rows from different tables into a single result set.

Types:-

There are 4 types of joins

1. Inner join 3. Right join

2. Left join 4. Full join

1. Inner join:-

It returns only the rows that have matching values in both tables.

2. Left join:-

It returns all rows from the left table and matching rows from the right table. It gives null values when the values are not matched.

3. Right join:-

It returns rows from right table and matching rows from the left table. It gives null values when the values are not matched.

4. Full join:-

It returns rows from both tables

including null values where there are no matches.

Ex:-

Create table emp(name varchar(5), deptid int);

insert all into emp(name, deptid) :

values ('ravi', 12)

into emp(name, deptid)

values ('sony', 13)

into emp(name, deptid)

values ('mju', 14)

into emp(name, deptid)

values ('rani', 12)

select * from dual;

Create table dep(dname varchar(5), deptid int);

insert all into dep(dname, deptid) :

values ('Abc', 12)

into dep(dname, deptid)

values ('mno', 13)

into dep(dname, deptid)

values ('pqr', 14)

into dep(dname, deptid)

values ('def', 15)

select * from dual;

Select * from emp;

Select * from dep;

select emp.name, dep.dname from emp inner

join dep on emp.deptid = dep.deptid;

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Output :-

Name	D.name
ravi	abc
raju rani	abc
Sony	mno
raju	pqr

Insert into emp values ('ram', 16);

select * from emp;

select * from dep;

select emp.name, dep.dname from emp left
join dep on emp.deptid = dep.deptid;Output :-

name	D.name
Ravi	abc
Rani	abc
Sony	mno
raju	pqr
ram	

Select emp.name, dep.dname from emp right

join dep on emp.deptid = dep.deptid;

	name	D-name	
	Ravi	abc	
	Sony	mno	
	raju	pqr	
	rani	abc	
		def	

select emp-name, dep-dname from emp full join
dep on emp.deptid = dep-deptid;

	name	D-name	
	ravi	abc	
	Sony	mno	
	raju	pqr	
	rani	abc	
	ram	def	

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Assignment Topic: Relational set operation.

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8. Explain the different types of relational set operations with an example?

i) These operations are performed on tables to manipulate the data.

There are 4 types of set operations they are.

1. union

2. union all

3. intersect

4. minus.

When we perform these operations we need two tables. These operations uses two select statements.

The no. of columns must be same in both the tables while performing set operations.

union :-

This operation returns the rows from both the tables duplicate rows occurs only one time.

union all :-

It returns all the rows from both the tables including duplicate rows.

intersect :-

It returns the rows that are common in both the tables.

minus :-

It returns the rows that are present in 1st table but not in 2nd table.

Ex:-

Create table bra (id int, name varchar(5));

Insert into bra values (1, 'ragu');

Insert into bra values (2, 'ravi');

Select * from bra;

Create table bsc (id int, name varchar(5));

Insert into bsc values (1, 'sony');

Insert into bsc values (2, 'ragu');

Select * from bsc;

Select * from bra union select * from bsc;

Select * from bra union all select * from bsc;

Select * from bra intersect select * from bsc;

Select * from bra minus select * from bsc;

Q. Define cursor? Explain the types of cursors in PL/SQL?

A) cursor is a temporary work area created in system memory. It stores results of queries that is executed by SQL select statement.

They are 2 types of cursors they are.

1. Implicit cursor.

2. Explicit cursor.

1. Implicit cursor:-

They are automatically created by SQL software internally when SQL statement is executed in SQL software. The cursor automatically allocates memory.

2. Explicit cursor:-

These are user-defined cursor.

We can create our own cursors with any user-defined name. It is used to process queries result one row at a time. To create user defined cursors we have to follow four steps.

1. Create the cursor and declare variables in cursor.

2. Open the cursor to allocate memory.

3. Fetch the cursor into cursor variable.

4. Close the cursor to release allocated memory.

Ex:-

```
create table emp(id int, name varchar(5), sal int);
insert into emp values (1, 'raju', 2000);
insert into emp values (2, 'rani', 3000);
```

select * from emp;

Set serveroutput on

Declare

a-id int;

a-name varchar(5)

cursor a-emp is select id, name from emp;

begin

open a-emp;

fetch a-emp into a-id, a-name;

dbms-output.put-line ('id:' || a-id);

dbms-output.put-line ('name:' || a-name);

close a-emp;

end;

/

10. Procedure :-

~~~~~

It is a block of code which performs specific tasks. These are reusable code blocks that perform specific actions. They have been defined with a specific name after creating procedure. We have to call the procedure using procedure name.

There are 3 types of parameters used in procedures they are: In, Out, InOut.

In parameter :-

~~~~~

It is used to send data to the procedure.

Out parameter :-

~~~~~

It returns data from the procedure.

In Out parameter :-

~~~~~

It is a combination of In and Out parameter.

Syntax:-

~~~~~

Create or replace procedure procedure name (parameters  
InOut, InOut data types.);

IS / AS

Begin

... procedure body ...

end;

/

Ex:- procedure without parameters.

Create or replace procedure bca  
is

Begin

dbms\_output.putline('hi');

End;

/

output:-

procedure successfully created

calling the procedure

begin

bca;

end;

/

output:- hi

Ex:-

procedure with parameters (In, out)

Create or replace procedure bca(a int, b int,  
c out int)

is

Begin

c=a+b;

end;

/

Calling the procedure :-

declare

c int;

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```
begin  
bca(5,3,c);  
dbms-output.put-line("the value of c is : "||c);  
end;  
,
```

Output : The value of c is 8.

Ex :-

procedure with parameters (in)  
create or replace procedure bca (a inout in)  
is

```
Begin  
a:=out;  
End;  
,
```

Calling the procedure

declare

a int;

begin

bca(s)

```
dbms-output.put-line('the value of a is : '||a);  
end;  
,
```