

Indexes:-

<u>EMP</u>				
EMPNO	ENAME	SAL	DEPNO.	Rowid
5	A	5000	1	x001
4	A	6000	1	x002
1	C	7000	1	x003
2	P	9000	2	x005
3	E	8000	2	x006

- Present in all RDBMS, all DBMS and some programming language also.
- To speed up the searching.
- select * from emp where empno = 1;
- To speed up the select statement with a where clause.

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Indemp. Inbuilt automatic

Rowid.	DeptNo.
x001	1
x002	2
x003	3
x004	4
x005	5

- indexes are automatically invoked by MySQL and when required.
- select * from emp where empno = 1;
 - 1) read
 - 2) compile
 - 3) plan
 - 4) execute
- Execution plan: - plan created by MySQL as how it is going to execute the select statement

create index;

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- In other RDBMS: -
insert / update / delete;
REINDEX;
- indexes are automatically updated by MySQL for all DML operation.
- select * from emp where ename = 'D';
- select * from emp where sal > 7000;
- no upper limit on the number of indexes per table
- larger the no. of indexes, the slower would be the DML operations.
- you cannot index text & blob
- duplicate values are not stored in an index
- null values are not stored in index.

- select * from emp where empno is null;
(full table scan) (very slow)
- select * from emp where empno = 0;
- select * from emp where empno = ' ';
- select * from emp
where empno = 2 and sal > 5000;

• if you have 2 or more independent columns in where clauses, then create separate indexes for each column; MySQL will use both the indexes as and when required.

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- select * from emp
where deptno = 1 and empno = 1

• Composite index:-

Combine 2 or more interdependent columns in a single index

• index key: column or set of columns on whose basis the index has been created.

• you can combine up to 32 column in a composite index.

index key.		
IND-DEPTNO-EMPNO.		
Rowid	Deptno	empno.
x001	1	1
x002	1	2
x003	1	3
x004	2	4
x005	3	5

← ~~Primary~~ secondary index key

~~Primary~~ Primary index key.

Conditions when an index should be created:-

- if select statement has a where clause
 - select * from emp where empno = 1;
 - select * from emp where empno = 5;
 - select * from emp where empno < 2;
 - select * from emp where empno > 1;

- if select statement retrieves $\leq 25\%$ of table data
- primary key and unique columns should always be indexed
(because it is better for searching.)

<u>Dept</u>			
	Deptno	Dname	Loc.
2001	1	TRN	Bby
2002	2	Exp	DIK
2003	3	Mkt.	cal.

- select dname, ename from emp, dept
where dept.deptno = emp.deptno;

<u>I1</u>	
Rowid.	Deptno
2001✓	1✓
2002	2
2003	3
2004	2
2005	2

<u>I2.</u>	
Rowid	Deptno.
X001✓	1✓
X002✓	1✓
X003✓	1✓
X004	2
X005	2.

- Common columns in join operations should always be indexed.

- select * from emp where ~~deptno~~^{empno} = 1.

command to create index:

Create index indexname on table(column);

- Create index i-emp-empno on emp(empno);
- select * from emp where empno = 1;
- create index i-emp-ename on emp(ename);
- create index i-emp-sal on emp(sal);

to see which all indexes are created for a particular tables;

- show indexes from emp;

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to see all the indexes on all the tables in the database:-

- use information - schema;
select * from statistics;

- statistics is a system table.

- by default all indexes are in ascending order
(common for all RDBMS).

- Create index i-emp-empno on emp(empno desc);

- Create index i-orders-onum on emp(onum desc);

to create composite index:

- Create index i-emp-deptno-empno on emp(deptno,
empno);

primary
index key
↓

secondary
index
key

- create index i-emp-deptno-empno on emp
(deptno desc, empno);

- create index i-emp-deptno-empno on emp
(deptno desc, empno desc);

to drop the index:

- drop index i-emp-empno on emp;

- Create unique index i-emp-empno on emp(empno);

- works like normal index

- performs one extra function;

it won't allow the user to insert duplicate values for EMPNO.

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Types of indexes:-

1. Normal index

2. unique index

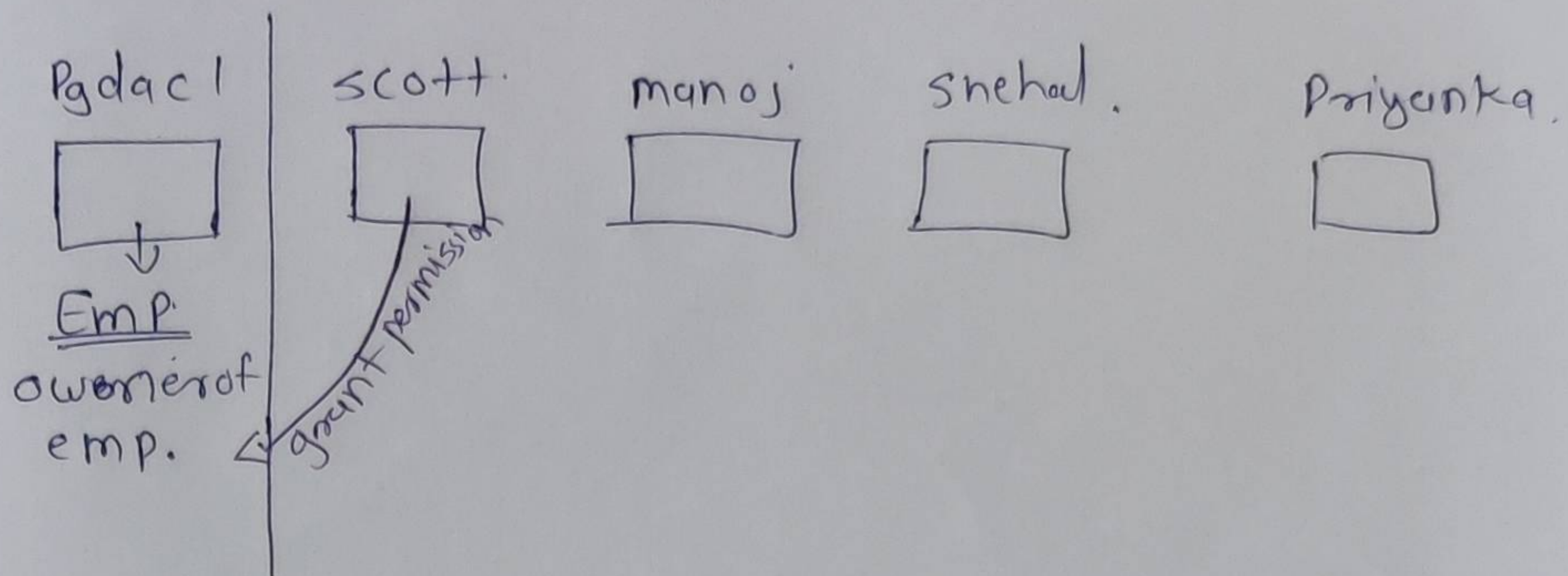
3. clustered index, etc.

4. bitmap index

(advanced features in Oracle).

Privileges:-

Grant & Revoke (DCL),



PgDAC - MySQL (user) ←

- grant select on emp to scott;
- grant insert on emp to scott;
- grant update on emp to scott;
- grant delete on emp to scott;

We cannot grant drop command & create command.

- grant select, insert on emp to scott;
- grant all on emp to scott;
- grant select on emp to scott, manoj, snehal;
- grant select, insert on emp to scott, manoj, snehal;

Revoke

- revoke select on emp from scott;
- grant select on emp to public;

to see the granted and received permission:-

- select * from information-schema-table-privileges;

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