EXPERIMENT-3

AIM: Examples on Implemnetation of Constraints
PRIMARY KEY, FOREIGN KEY, CHECK, NOT NULL, UNIQUE

PRIMARY KEY:
The PRIMARY KEY constraint uniquely identifies each record in a table

Adding a PRIMARY KEY:

a)Using Create:

Syntax:
1.create table table_name(col_1 datatype(size),col_2 datatype(size),…,PRIMARY KEY(col_name));
2.create table table_name (col_1 datatype(size),col_2 datatype(size) PRIMARY KEY,…);
Example:

1. create table PROJECT_91(Pname varchar(30),Pnumber int,Plocation varchar(20) ,Dnum int,primary key(Pnumber));
   desc PROJECT_91;
2. create table PROJECT_91(Pname varchar(30), Pnumber int primary key , Plocation varchar(20),Dnum int);
   desc PROJECT_91;

Output:

Field	Type	Null	Key	Default	Extra
Pname	varchar(30)	YES		NULL	
Pnumber	int	NO	PRI	NULL	
Plocation	varchar(20)	YES		NULL	
Dnum	int	YES	MUL	NULL	

b)Using Alter:

Syntax:
alter table table_name add primary key (col_name);
Example:

alter table PROJECT_91 add primary key (Pnumber);
desc PROJECT_91;

Output:

Field	Type	Null	Key	Default	Extra
Pname	varchar(30)	YES		NULL	
Pnumber	int	NO	PRI	NULL	
Plocation	varchar(20)	YES		NULL	
Dnum	int	YES	MUL	NULL	

Drop a PRIMARY KEY:
Syntax:

Alter table table_name drop primary key;

Example:

```
alter table DEPT_LOCATIONS_91 drop primary key;
desc DEPT_LOCATIONS_91;
```

Output :

	Field	Type	Null	Key	Default	Extra
▶	Dnumber	int	YES		NULL	
	Dlocation	varchar(30)	YES		NULL	

FOREIGN KEY:

A FOREIGN KEY is a key used to link two tables
A FOREIGN KEY is a field(or collection of fields) in one table that refers to the PRIMARY KEY In another table

Adding a FOREIGN KEY:

Syntax:

a)Using Create:
1.create table table_name(col_1 datatype(size),col_2 datatype(size),….,FOREIGN KEY (col_name) references table_name (col_name));
2.create table table_name(col_1 dataype(size),col_2 datatype(size) references table_name (col_name),..,);

Example:

```
CREATE table EMPLOYEE_93(Fname varchar(15),Minit char(1),Lname varchar(15),Ssn int,Bdate date,Address varchar(30),Sex char(1),Salary decimal(10,2),Super_ssn int, Dno int,FOREIGN KEY ( Dno ) references DEPARTMENT_91 (Dnumber),primary key(Ssn));
desc EMPLOYEE_91;
```

b)Using Alter:
alter table table_name add foreign key(col_name) references table_name(col_name);

Example:

```
alter table EMPLOYEE_91 add foreign key (Dno) references
 department_91 (dnumber);
desc EMPLOYEE_91 ;
```

Output:

	Field	Type	Null	Key	Default	Extra
▶	Fname	varchar(15)	YES		NULL	
	Minit	char(1)	YES		NULL	
	Lname	varchar(15)	YES		NULL	
	Ssn	int	NO	PRI	NULL	
	Bdate	date	YES		NULL	
	Address	varchar(30)	YES		NULL	
	Sex	char(1)	YES		NULL	
	Salary	decimal(10,2)	YES		NULL	
	Super_ssn	int	YES		NULL	
	Dno	int	YES	MUL	NULL	

NOT NULL:

By default, a column can hold NULL values

The NOT NULL constraint enforces a column to NOT accept NULL values

Syntax:

Using Create:

create table table_name (col_1 datatype(size),col_2 datatype(size) NOT NULL,……..);

Example:

create table EMPLOYEE_91(Fname varchar(15),Minit char,Lname varchar(15),Ssn int NOT NULL,Bdate date,Address varchar(30),Sex char,Salary decimal(10,2),Super_ssn int,Dno int,primary key(Ssn));

desc EMPLOYEE_91;

Using Alter:

alter table table_name modify col_name datatype(size) NOT NULL;

Example:

ALTER table EMPLOYEE_91 modify Ssn int NOT NULL;

desc EMPLOYEE_91;

Output :

Field	Type	Null	Key	Default	Extra
Fname	varchar(15)	YES		NULL	
Minit	char(1)	YES		NULL	
Lname	varchar(15)	YES		NULL	
Ssn	int	NO	PRI	NULL	
Bdate	date	YES		NULL	
Address	varchar(30)	YES		NULL	
Sex	char(1)	YES		NULL	
Salary	decimal(10,2)	YES		NULL	
Super_ssn	int	YES		NULL	
Dno	int	YES	MUL	NULL	

UNIQUE:

The UNIQUE constraint ensures that all values in a column are different

a)Using Create:

Syntax:

create table table_name(col_1 datatype(siize),col_2 datatype(size),…,col_n datatype(size), UNIQUE (col_name));

Example:

create table EMPLOYEE_91(Fname varchar(15),Minit char,Lname varchar(15),Ssn int NOT NULL ,Bdate date,Address varchar(30),Sex char,Salary decimal(10,2),Super_ssn int,Dno int,primary key(Ssn), UNIQUE(Ssn));

desc EMPLOYEE_91;

b)Using Alter:

Syntax:

alter table table_name add UNIQUE (column_name);

Example:

ALTER table EMPLOYEE_91 ADD UNIQUE(ssn);

desc EMPLOYEE_91;

Output:

Field	Type	Null	Key	Default	Extra
Fname	varchar(15)	YES		NULL	
Minit	char(1)	YES		NULL	
Lname	varchar(15)	YES		NULL	
Ssn	int	NO	PRI	NULL	
Bdate	date	YES		NULL	
Address	varchar(30)	YES		NULL	
Sex	char(1)	YES		NULL	
Salary	decimal(10,2)	YES		NULL	
Super_ssn	int	YES		NULL	
Dno	int	YES	MUL	NULL	

CHECK:

The CHECK constraint is used to limit the values range that can be placed in a column

Syntax:

a)Using CREATE:

Create table table_name(col_1 datatype(size),col_2 datatype(size),…,col_n datatype(size), CHECK (col_name condition value));

Example:

```
CREATE table EMPLOYEE_91(Fname varchar(15),Minit char(1),Lname
varchar(15),Ssn int NOT NULL,Bdate date,Address varchar(30),Sex
char(1),Salary decimal(10,2),Super_ssn int, Dno int ,foreign key  ( Dno )
references DEPARTMENT_91(Dnumber),CHECK(sex=”M”));
desc EMPLOYEE_91;
```

b)Using Alter:

alter table table_name add CHECK (col_ condition value);

Example:

```
ALTER table EMPLOYEE_91 Add CHECK(Sex=”M”);
desc EMPLOYEE_91;
```

Output:

Field	Type	Null	Key	Default	Extra
Fname	varchar(15)	YES		NULL	
Minit	char(1)	YES		NULL	
Lname	varchar(15)	YES		NULL	
Ssn	int	NO	PRI	NULL	
Bdate	date	YES		NULL	
Address	varchar(30)	YES		NULL	
Sex	char(1)	YES		NULL	
Salary	decimal(10,2)	YES		NULL	
Super_ssn	int	YES		NULL	
Dno	int	YES	MUL	NULL	

CREATE:

The CREATE TABLE statement is used to create a new table in a database

Syntax:

create table table_name (column_1 datatype(size),column_2 datatype(size),….);

CREATION OF DEPT_LOACTIONS_TABLE:

mysql> Create table dept_locations_91(dnumber int,dlocation varchar(30) not null ,primary key (dnumber,dlocation),foreign key(dnumber) references department(dnumber));

	Field	Type	Null	Key	Default	Extra
▶	dnumber	int	NO	PRI	NULL	
	dlocation	varchar(30)	NO	PRI	NULL	

CREATION OF PROJECT TABLE:

Mysql> create table project_91 (pname varchar(30),pnumber int,plocation varchar(20),dnum int,primary key(pnumber));

	Field	Type	Null	Key	Default	Extra
▶	pname	varchar(30)	YES		NULL	
	pnumber	int	NO	PRI	NULL	
	plocation	varchar(20)	YES		NULL	
	dnum	int	YES	MUL	NULL	

CREATION OF WORKS_ON TABLE:

Mysql> create table works_on_91(essn int , pno int, hours decimal(6,2),primary key(essn,pno));

	Field	Type	Null	Key	Default	Extra
▶	essn	int	NO	PRI	NULL	
	pno	int	NO	PRI	NULL	
	hours	decimal(6,2)	YES		NULL	

CREATION OF DEPENDENTS TABLE:

Mysql> CREATE TABLE dependent_91(essn INT,dependent_name VARCHAR(30),sex VARCHAR(10),bdate DATE,relationship VARCHAR(20),PRIMARY KEY (essn , dependent_name));

	Field	Type	Null	Key	Default	Extra
▶	essn	int	NO	PRI	NULL	
	dependent_name	varchar(30)	NO	PRI	NULL	
	sex	varchar(10)	YES		NULL	
	bdate	date	YES		NULL	
	relationship	varchar(20)	YES		NULL	

INSERT:

The INSERT INTO statement is used to insert new records in a table

Synatx:

insert into table_name (col_1,col_2,..,col_n) values (data_1,data_2,..,data_n);

INSERTION INTO DEPT_LOCATIONS TABLE:

Mysql> insert into dept_locations_91 values
(1,'houston'),(4,'stafford'),(5,'bellaire'),(5,'sugarland'),(5,'houston');

dnumber	dlocation
1	houston
4	stafford
5	bellaire
5	houston
5	sugarland
NULL	NULL

INSERTION INTO PROJECT TABLE;
Mysql> insert into project_91 values
('product_x',1,'bellaire',5),('product_y',2,'sugarland',5),('product_z',3,'houston',5),('computerization',10,'stafford',4),('reorganization',20,'houston',1),('newbenefits',30,'stafford',4);

pname	pnumber	plocation	dnum
product_x	1	bellaire	5
product_y	2	sugarland	5
product_z	3	houston	5
computerization	10	bellaire	5
reorganization	20	houston	1
newbenefits	30	stafford	4
NULL	NULL	NULL	NULL

INSERTION INTO WORKS_ON TABLE:

Mysql> insert into works_on_91 values
(123456789,1,32.5),(123456789,2,7.5),(666884444,3,40.0),(453453453,1,20.0),(453453453,2,20.0),(333445555,2,10.0),(333445555,3,10.0),(333445555,10,10.0),(333445555,20,10.0),(999887777,30,30.0),
(999887777,10,10.0),(987987987,10,35.0),(987987987,30,5.0),(987654321,30,20.0),(987654321,20,15.0),(888665555,20,null);

essn	pno	hours
123456789	1	32.50
123456789	2	7.50
333445555	2	10.00
333445555	3	10.00
333445555	10	10.00
333445555	20	10.00
453453453	1	20.00
453453453	2	20.00
666884444	3	40.00
888665555	20	NULL
987654321	20	15.00
987654321	30	20.00
987987987	10	35.00
987987987	30	5.00
999887777	10	10.00
999887777	30	30.00
NULL	NULL	NULL

INSERTION INTO DEPENDENTS TABLE:

Mysql> insert into dependent_91 values (333445555,'alice','f','1986-04-05','daughter'),(333445555,'theodore','m','1983-10-25','son'),(333445555,'joy','f','1958-05-03','spouse'),
(987654321,'abner','m','1942-02-08','spouse'),(123456789,'michael','m','1988-01-04','son'),(123456789,'alice','f','1988-12-30','daughter'),(123456789,'elizabeth','f','1967-05-05','spouse');

essn	dependent_name	sex	bdate	relationship
123456789	alice	f	1988-12-30	daughter
123456789	elizabeth	f	1967-05-05	spouse
123456789	michael	m	1988-01-04	son
333445555	alice	f	1986-04-05	daughter
333445555	joy	f	1958-05-03	spouse
333445555	theodore	m	1983-10-25	son
987654321	abner	m	1942-02-08	spouse
NULL	NULL	NULL	NULL	NULL