

Lab 1:

Title of the Exercise: DATA DEFINITION LANGUAGE (DDL) COMMANDS**a) Procedure for doing the experiment:**

Step no.	Details of the step
1	DDL COMMAND It is used to communicate with database. DDL is used to: <ul style="list-style-type: none"> ➤ Create an object. ➤ Alter the structure of an object. ➤ To drop the object created.
2	The commands used are: Create, Alter, Drop, Truncate
3	INTEGRITY CONSTRAINT An integrity constraint is a mechanism used to prevent invalid data entry into the table. It has enforcing the rules for the columns in a table. The types of the integrity constraints are: <ul style="list-style-type: none"> a) Domain Integrity b) Entity Integrity c) Referential Integrity
4	a) Domain Integrity: This constraint sets a range and any violations that take place will prevent the user from performing the manipulation that caused the breach. It includes: <ul style="list-style-type: none"> ➤ Not Null constraint: While creating tables, by default the rows can have null value .the enforcement of not null constraint in a table ensure that the table contains values. ➤ Principle of null values: <ul style="list-style-type: none"> ❖ Setting null value is appropriate when the actual value is unknown, or when a value would not be meaningful. ❖ A null value is not equivalent to a value of zero. ❖ A null value will always evaluate to null in any expression. ❖ When a column name is defined as not null, that column becomes a mandatory i.e., the user has to enter data into it. ❖ Not null Integrity constraint cannot be defined using the alter table command when the table contain rows.
5	<ul style="list-style-type: none"> ➤ Check Constraint: Check constraint can be defined to allow only a particular range of values. When the manipulation violates this constraint, the record will be rejected. Check condition cannot contain sub queries.
6	b) Entity Integrity Maintains uniqueness in a record. An entity represents a table and each row of a table represents an instance of that entity. To identify each row in a table uniquely we need to use this constraint. There are 2 entity constraints: <ul style="list-style-type: none"> ➤ Unique key constraint: <ul style="list-style-type: none"> ❖ It is used to ensure that information in the column for each record is unique, as with telephone or drivers license ints. ❖ It prevents the duplication of value with rows of a specified column in a set of column.

	<ul style="list-style-type: none"> ❖ A column defined with the constraint can allow null value. If unique key constraint is defined in more than one column i.e., combination of column cannot be specified. ❖ Maximum combination of columns that a composite unique key can contain is 16. <p>➤ Primary Key Constraint:</p> <ul style="list-style-type: none"> ❖ A primary key avoids duplication of rows and does not allow null values. ❖ It can be defined on one or more columns in a table and is used to uniquely identify each row in a table. ❖ These values should never be changed and should never be null. ❖ A table should have only one primary key. ❖ If a primary key constraint is assigned to more than one column or combination of column it is said to be composite primary key, which can contain 16 columns.
7	<p>c) Referential Integrity:</p> <ul style="list-style-type: none"> ➤ It enforces relationship between tables. ➤ To establish parent-child relationship between 2 tables having a common column definition, we make use of this constraint. ➤ To implement this, we should define the column in the parent table as primary key and same column in the child table as foreign key referring to the corresponding parent entry. <p>➤ Foreign key:</p> <ul style="list-style-type: none"> ❖ A column or combination of column included in the definition of referential integrity, which would refer to a referenced key. ❖ Referenced key It is a unique or primary key upon which is defined on a column belonging to the parent table.

Data Types:**Exact Numerics**

bigint	numeric
bit	smallint
decimal	smallmoney
int	tinyint
money	

Approximate Numerics

float	real
-------	------

Date and Time

date	datetimeoffset
datetime2	smalldatetime
datetime	time

Character Strings

char	varchar
text	

Unicode Character Strings

nchar	nvarchar
ntext	

Binary Strings

binary	varbinary
image	

Other Data Types

cursor	timestamp
hierarchyid	uniqueidentifier
sql_variant	xml
table	Spatial Types

2. SQL Commands:**❖ CREATE TABLE:**

- ❖ It is used to create a table
- ❖ **Syntax:** Create table tablename
(column_name1 data_type constraints,
column_name2 data_type constraints ...
)

Example:

Create table Emp (EmpNo int, EName VarChar(15), Job Char(10) constraint un unique, DeptNo int CONSTRAINT FKKey2 REFERENCES DEPT(DeptNo));

Create table stud (sname nvarchar(20) not null, rollno int not null, dob datetime not null);

Rules:

- a) Reserved words cannot be used.
- b) Underscore, numerals, letters are allowed but not blank space.
- c) Maximum length for the table name is 30 characters.
- d) Different tables should not have same name.
- e) We should specify a unique column name.
- f) We should specify proper data type along with width.
- g) We can include "not null" condition when needed. By default it is „null“.

❖ ALTER TABLE

❖ Alter command is used to:

1. Add a new column
2. Modify the existing column definition.
3. To include or drop integrity constraint.

Syntax:

alter table tablename add/ alter column (attribute datatype(size));

Example:

Alter table emp add phone_no nvarchar (20);

Alter table emp alter column phone_no int;

ALTER TABLE EMP ADD CONSTRAINT Pkey1 PRIMARY KEY (EmpNo);

❖ DROP TABLE

❖ It will delete the table structure provided the table should be empty.

Example: drop table prog20; Here prog20 is table name

❖ TRUNCATE TABLE

❖ If there is no further use of records stored in a table and the structure has to be retained then the records alone can be deleted.

Syntax: TRUNCATE TABLE <TABLE NAME>;

Example: Truncate table stud;

➤ DESC

❖ This is used to view the structure of the table.

Example: desc emp;

DOMAIN INTEGRITY**Example:**

Create table cust(custid int not null, name nvarchar(10));

Alter table emp alter column ename nvarchar(30) not null; **CHECK CONSTRAINT**

Example:

Create table student (regno int, mark int constraint b check (mark >=0 and mark <=100));

Alter table student add constraint b2 check (regno<=4);

ENTITY INTEGRITY**a) Unique key constraint****Example:**

Create table cust(custid int constraint un unique, name nvarchar(10));

b) Alter table cust add constraint c unique(custid);**c) Primary Key Constraint****Example:**

Create table stude(regno int primary key, name char(20));

3. Queries:

Before going through this follow following steps:

- i. Lunch mysql through shell.
mysql -u root -p
- ii. Create database dbLAB1.
- iii. Use the created database.
- iv. To view columns of table → show columns from tblname;

Q1. Create a table called EMP with the following structure.

Name	Type
EMPNO (primary key)	INT
ENAME	NVARCHAR(20)
JOB	NVARCHAR(10)
DEPTNO	INT
SAL	INT

Allow NULL for all columns except ename and job.

Solution:

1. Understand create table syntax.
2. Use the create table syntax to create the said tables.
3. Create primary key constraint for each table as understand from logical table structure.

SQL> create table emp(empno int primary key, ename nvarchar(20)not null,job nvarchar(10) not null, deptno int, sal int);
Table created.

Q2: Add a column experience to the emp table. experience numeric null allowed.

1. Learn alter table syntax.
2. Define the new column and its data type.
3. Use the alter table syntax.

Ans: SQL> alter table emp add experience int;
Table altered

Q3: Modify the column width of the job field of emp table.

1. Use the alter table syntax.
2. Modify the column width and its data type.

Ans: SQL> alter table emp Modify COLUMN job nvarchar(12); Table altered. SQL> alter table emp modify column job varchar(13);
Table altered.

Q4: Create dept table with the following structure

Name	Type
DEPTNO	INT
DNAME	NVARCHAR(10)
LOC	NVARCHAR(10)

Deptno as the primarykey

1. Understand create table syntax.
2. Decide the name of the table.
3. Decide the name of each column and its data type.
4. Use the create table syntax to create the said tables.
5. Create primary key constraint for each table as understand from logical table structure.

Ans: SQL> `create table dept(deptno int primary key,dname nvarchar(10),loc nvarchar(10));`
Table created.

Q5: create the emp1 table with ename and empno, add constraints to check the empno value while entering (i.e) empno > 100.

1. Learn alter table syntax.
2. Define the new constraint [columns name type]
3. Use the alter table syntax for adding constraints.

Ans: SQL> `create table emp1(ename nvarchar(10),empno int, check(empno>100));`
Table created.

Q6: drop a column experience to the emp table.

1. Learn alter table syntax.
2. Use the alter table syntax to drop the column.

Ans: SQL> `alter table emp drop column experience;`
Table altered.

Q7: Truncate the emp table and drop the dept table

1. Learn drop, truncate table syntax.

Ans: SQL> `truncate table emp;`
Table truncated.

SQL> `drop table dept;`
Table dropped.

4. Result:

Thus the data definition language commands was performed and implemented successfully.

QUESTIONS AND ANSWERS

1. Define the terms DDL.
2. What are the categories of SQL command?
3. What is integrity constraint?
4. List the types of constraint.

5. Primary Key Constraint .

6. Referential Integrity