Data types in mysql

- Numeric
- Date and Time
- String Types.

Let us now discuss them in detail.

Numeric Data Types

MySQL uses all the standard ANSI SQL numeric data types, so if you're coming to MySQL from a different database system, these definitions will look familiar to you. The following list shows the common numeric data types and their descriptions −

- **INT** − A normal-sized integer that can be signed or unsigned. If signed, the allowable range is from -2147483648 to 2147483647. If unsigned, the allowable range is from 0 to 4294967295. You can specify a width of up to 11 digits.
- **TINYINT** − A very small integer that can be signed or unsigned. If signed, the allowable range is from -128 to 127. If unsigned, the allowable range is from 0 to 255. You can specify a width of up to 4 digits.
- **SMALLINT** − A small integer that can be signed or unsigned. If signed, the allowable range is from -32768 to 32767. If unsigned, the allowable range is from 0 to 65535. You can specify a width of up to 5 digits.
- **MEDIUMINT** − A medium-sized integer that can be signed or unsigned. If signed, the allowable range is from -8388608 to 8388607. If unsigned, the allowable range is from 0 to 16777215. You can specify a width of up to 9 digits.
- **BIGINT** − A large integer that can be signed or unsigned. If signed, the allowable range is from -9223372036854775808 to 9223372036854775807. If unsigned, the allowable range is from 0 to 18446744073709551615. You can specify a width of up to 20 digits.
- **FLOAT(M,D)** − A floating-point number that cannot be unsigned. You can define the display length (M) and the number of decimals (D). This is not required and will default to 10,2, where 2 is the number of decimals and 10 is the total number of digits (including decimals). Decimal precision can go to 24 places for a FLOAT.
- **DOUBLE(M,D)** − A double precision floating-point number that cannot be unsigned. You can define the display length (M) and the number of decimals (D). This is not required and will default to 16,4, where 4 is the number of decimals. Decimal precision can go to 53 places for a DOUBLE. REAL is a synonym for DOUBLE.
- **DECIMAL(M,D)** − An unpacked floating-point number that cannot be unsigned. In the unpacked decimals, each decimal corresponds to one byte. Defining the display length (M)

Date and Time Types

The MySQL date and time datatypes are as follows −

- **DATE** – A date in YYYY-MM-DD format, between 1000-01-01 and 9999-12-31. For example, December 30th, 1973 would be stored as 1973-12-30.
- **DATETIME** – A date and time combination in YYYY-MM-DD HH:MM:SS format, between 1000-01-01 00:00:00 and 9999-12-31 23:59:59. For example, 3:30 in the afternoon on December 30th, 1973 would be stored as 1973-12-30 15:30:00.
- **TIMESTAMP** – A timestamp between midnight, January 1st, 1970 and sometime in 2037. This looks like the previous DATETIME format, only without the hyphens between numbers; 3:30 in the afternoon on December 30th, 1973 would be stored as 19731230153000 (YYYYMMDDHHMMSS).
- **TIME** – Stores the time in a HH:MM:SS format.
- **YEAR(M)** – Stores a year in a 2-digit or a 4-digit format. If the length is specified as 2 (for example YEAR(2)), YEAR can be between 1970 to 2069 (70 to 69). If the length is specified as 4, then YEAR can be 1901 to 2155. The default length is 4.

String Types

Although the numeric and date types are fun, most data you'll store will be in a string format. This list describes the common string datatypes in MySQL.

- **CHAR(M)** – A fixed-length string between 1 and 255 characters in length (for example CHAR(5)), right-padded with spaces to the specified length when stored. Defining a length is not required, but the default is 1.
- **VARCHAR(M)** – A variable-length string between 1 and 255 characters in length. For example, VARCHAR(25). You must define a length when creating a VARCHAR field.
- **Nvarchar** stores Unicode or Non-English character data types, and it can contain a maximum of 4000 characters. It supports ASCII values as well as special characters. To support multiple languages, nvarchar is a must.

- **BLOB or TEXT** – A field with a maximum length of 65535 characters. BLOBs are "Binary Large Objects" and are used to store large amounts of binary data, such as images or other types of files. Fields defined as TEXT also hold large amounts of data. The difference between the two is that the sorts and comparisons on the stored data are **case sensitive** on BLOBs and are **not case sensitive** in TEXT fields. You do not specify a length with BLOB or TEXT.
- **TINYBLOB or TINYTEXT** – A BLOB or TEXT column with a maximum length of 255 characters. You do not specify a length with TINYBLOB or TINYTEXT.
- **MEDIUMBLOB or MEDIUMTEXT** – A BLOB or TEXT column with a maximum length of 16777215 characters. You do not specify a length with MEDIUMBLOB or MEDIUMTEXT.
- **LONGBLOB or LONGTEXT** – A BLOB or TEXT column with a maximum length of 4294967295 characters. You do not specify a length with LONGBLOB or LONGTEXT.

- **ENUM** – An enumeration, which is a fancy term for list. When defining an ENUM, you are creating a list of items from which the value must be selected (or it can be NULL). For example, if you wanted your field to contain "A" or "B" or "C", you would define your ENUM as ENUM ('A', 'B', 'C') and only those values (or NULL) could ever populate that field.

To create table

1. CREATE TABLE IF NOT EXISTS newpublisher

```
(pub_id varchar(8) NOT NULL UNIQUE DEFAULT '' ,
pub_name varchar(50) NOT NULL  DEFAULT '' ,
pub_city varchar(25) NOT NULL  DEFAULT '' ,
country varchar(25) NOT NULL DEFAULT 'India',
country_office varchar(25) ,
no_of_branch int(3),
pub_date date,
CHECK ((country='India' AND pub_city='Mumbai')
OR (country='India' AND pub_city='New Delhi')) ,
PRIMARY KEY (pub_id));
```

2. CREATE TABLE IF NOT EXISTS newauthor

(id int NOT NULL AUTO_INCREMENT,

aut_id varchar(8),

aut_name varchar(50),

country varchar(25),

home_city varchar(25) NOT NULL,

PRIMARY KEY (id));

to create a simple table

create table mytable(

id int,

name varchar(30));

constraints in the table

These are of 2 types

1. field level constraint- the constraint which you need to write immediately after column declaration are column level constraints
2. Table level constraint--- the constraints which are based on multiple columns, or dependent on some other column, then it is good to use table level constraint.

constraints

Not null	field level	It does not allow to add null values in the table
default	field level	If user does not specify any value, then instead null what value can be added in the column is defined with default constraint salary decimal(9,2) default 10000
primary key	table level	It does not allow null values and duplicate values, so values should be unique and not null In a table there can be only one primary key.
unique	field level	It does not allow duplicate values, but allows any number of null values
check constraint	table level	Before entering data in the column, if you want to check some condition, and if the condition is true, then only store the data, otherwise show error
foreign key constraint	table level	while entering value in the column, if you want to refer the value of primary key of

on delete <action> on update<action>		the same table or different table

create table product(

pid int primary key,

pname varchar(30) not null,

qty int check(qty>0),

price decimal(9,2) check (price between 1000 and 10000))

create table student(

sid int primary key,

sname varchar(30) not null,

marks int check(marks between 0 and 100),

address varchar(20),

email varchar(20))

create table person(

pid int primary key,

panme varchar(20),

address varchar(20) default ‘pune’)

To delete the table

drop table <tablename>

It will delete data along with the table structure.

To create table student_marks

```
create table stud_marks(
    sid int ,
    cname varchar(2),
marks int check(marks between 0 and 100,
grade enum('A','B','C'),
primary key(sid,cname)
)
```

create a table product

(pid, panme, qty,price,catid,sid)

create a table category

(cid, cname, description)

create a table salesman

(sid, sname, address)

pid	number	primary key
pname	varchar(25)	
qty	number	qty>0
price	float	price>10
catid	number	foreign key references cid of category
sid	number	foreign key references sid of salesman

category

cid	number	primary key
cname	varchar(30)	
description	varchar(100)	

Salesman

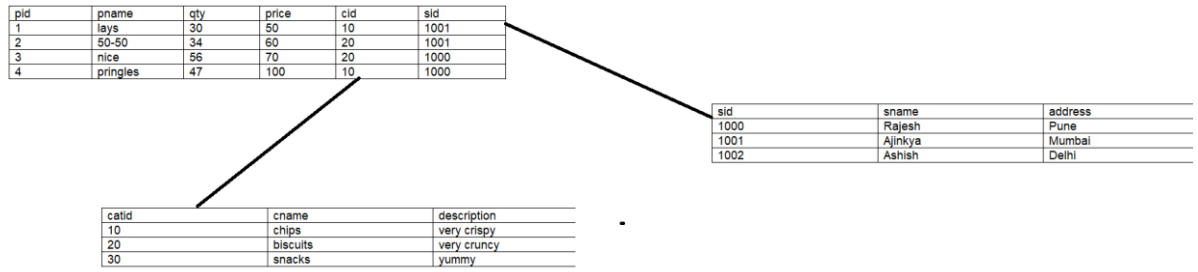
sid	number	primary key
sname	varchar(30)	
address	varchar(40)	

category

catid	cname	description
10	chips	very crispy
20	biscuits	very cruncy
30	snacks	yummy

sid	sname	address
1000	Rajesh	Pune
1001	Ajinkya	Mumbai
1002	Ashish	Delhi

pid	pname	qty	price	cid	sid
1	lays	30	50	10	1001
2	50-50	34	60	20	1001
3	nice	56	70	20	1000
4	pringles	47	100	10	1000




```
create table category(
cid int primary key,
cname varchar(20),
description varchar(100));
```

```
create table salesman(
sid int primary key,
sname varchar(20),
address varchar(20));
```

```
create table product(
pid int primary key,
pname varchar(20),
qty int check(qty>0),
price float(9,2),
catid int,
sid int,
constraint fk_cat foreign key(catid) references category(cid)
on delete set null
on update cascade,
constraint fk_sid foreign key(sid) references salesman(sid)
on delete set null
on update cascade)
```

insert into category values(10,'chips','very crispy');

Query OK, 1 row affected (0.00 sec)

mysql> insert into category values(11,'biscuits','very crunchy');

Query OK, 1 row affected (0.00 sec)

mysql> insert into category values(12,'snacks','yummy');

create owner table to store (ownerid, oname,address)

create vehicle table to store(vid,vname,make,model,company,ownerid,sid)

ownerid is a foreign key references owner table (ownwerid)

sid is a foreign key references salesman table (sid)

create a table salesman to store (sid, sname, address)

<table>
<tr><td>create table owner(
ownerid int primary key ,
oname varchar(20),
oaddress varchar(20))</td><td rowspan="2">create table vehicle(
vid int primary key ,
vaname varchar(20),
make varchar(20),
model varchar(20),
company varchar(20),
ownerid int ,
sid int ,
constraint f_ownerid foreign key (ownerid)
references owner(ownerid)
on delete set null
on update cascade ,
constraint f_sid foreign key (sid) references
salesman(sid)
on delete set null
on update cascade);</td></tr>
<tr><td>create table salesman(
sid int primary key,
sname varchar(20),
saddrerss varchar(20))</td></tr>
</table>

on delete (action)

on update (action)

action values.

cascade	if delete from parent table, then delete matching rows from child table, if update from parent table, then change the value is child table also
set null	if delete from parent table, then set value to null in matching rows from child table, if update from parent table, then set value to null in matching rows in child table
no action	if on delete and on update clause is not used, then values from the parent table an be deleted only if, the corresponding value does not exists in the child table

DML statements

insert	insert into <table> values(<values for all columns) insert into<table>(list of columns) values(<values for specified columns	insert into mytable values(12,'xxx','pune') insert into mytable(id,name) values(13,'yyy')
update	update <table> set fiedl1=val1,field2=val2, ... where <condition> if where cluse is not used then it will update all the rows	update mytable set name='ccc',addr='yyy' where id=12
delete	delete from <table> where <condition> if where cluse is not used then it will delete all the rows	delete from mytable where id=12
to insert multiple rows in a table	INSERT INTO tbl_name (a,b,c) VALUES (1,2,3), (4,5,6), (7,8,9);	insert into salesman(sid,sname,address) values(11,'xxx','Pune'), (12,'yyy','pune'), (13,'zzzz','mumbai');

to delete the table ----drop table will delete all the rows and will also delete data from the table

drop table <table name>

drop table emp;

to delete all the rows from the table

truncate table <table name>---it will delete all the rows from the table, but keep empty table as it is.

To set autocommit off

set autocommit=0;

To set autocommit on

set autocommit=1;

trauncate VS delete

Truncate	delete
It is a DDL statement, hence changes gets autocommit	it is DML statement, so auto commit is not there
roll back is not possible	roll back is possible
where cluse cannot be used	in delete where clause can be used

To change the table structure use Alter table <table name>

add column	alter table mytable add addr int first|after id;	alter table mytable add addr11 varchar(20) after id alter table mytable -> add addr11 varchar(20) after id, -> add addr12 int first;
delete the column	alter table <table name> drop column <colname>	alter table mytable drop column addr11
modify the existing column	alter table <table name> modify <existing column name> <modified details>	alter table mytable modify location varchar(50) alter table mytable modify location varchar(50) not NULL
rename the column	alter table <table name> CHANGE COLUMN old_name new_name column_definition	alter table mytable change location mylocation varchar(50)
add constraint	alter table < table name > add constraint <cn> foreign key ..... alter table < table name > add primary key(id)	
delete constraint	alter table < table name > drop constraint <cn>	
rename table	alter table <old table name> rename to <new table name>	alter table mytable rename to mytable11

ALTER TABLE User

ADD CONSTRAINT userProperties

FOREIGN KEY(properties)

REFERENCES Properties(ID)