

P3. Integrity Constraints

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Creating a Database:

Creating Tables

```
create database NGO_DB;
```

```
CREATE TABLE Members (  
MembershipID int primary key,  
Name varchar(100),  
Gender varchar(10),  
Designation varchar(100),  
Mobile_No varchar(20),  
DOB varchar(50)  
);
```

```
CREATE TABLE Donation (  
DonorID int primary key,  
Donor_Name varchar(100),  
Donation_Amount varchar(100),  
Donation_Date varchar(20)  
);
```

```
CREATE TABLE Query (  
QueryID int primary key,  
Name varchar(100),  
Query_Description varchar(100),  
Query_Date varchar(20)  
);
```

```
CREATE TABLE Events (  
EventID int primary key,  
Event_Name varchar(100),  
Event_Description varchar(100),  
Event_Date varchar(20)
```

);

Inserting values into respective tables

insert into Members values (100,"Udit Gupta", "Male", "President",
"7891492201","11/09/1998");

insert into Members values (101,"Mitali Khandelwal", "Female", "Secretary",
"78945612312","10/11/2001");

insert into Members values (102,"Sopan Sharma", "Male", "Treasurer",
"7661120420","14/05/1998");

insert into Members values (103,"Nishant Jain", "Male", "Member",
"9659487562","07/04/1999");

Insert into Events values (501,"Rakhi Celebratiob", "Sample", "01/08/2021");

insert into Events values (502,"Independence Day Celebration", "Sample",
"15/08/2021");

insert into Donation values(1110,"UDit",2000,"15/08/2021");

insert into Donation values(1111,"Mitali",2000,"15/08/2021");

1. NOT NULL - column cannot have a NULL value

a. Not Null Constraint

39 • desc Members;

Result Grid

Field	Type	Null	Key	Default	Extra
MembershipID	int	NO	PRI	NULL	
Name	varchar(100)	NO		NULL	
Gender	varchar(10)	NO		NULL	
Designation	varchar(100)	NO		NULL	
Mobile_No	varchar(20)	NO		NULL	
DOB	varchar(50)	NO		NULL	

b. Inserting null value to NOT NULL field

41 • insert into Members values (105,"Udit Gupta", "Male", "Member", "7891492201",NULL);

42

Output

#	Time	Action	Message	Duration / Fetch
1	10:25:29	use NGO_DB	0 row(s) affected	0.000 sec
2	10:25:34	insert into Members values (105,"Udit Gupta", "Male", "Member", "7891492201",NULL)	Error Code: 1048. Column 'DOB' cannot be null	0.000 sec

2. UNIQUE - all values in a column are different

a. Unique Key Constraint

```
43 • ALTER TABLE Members
44   ADD UNIQUE (Mobile_No);
45 • desc Members
```

Result Grid

	Field	Type	Null	Key	Default	Extra
▶	MembershipID	int	NO	PRI	NULL	
	Name	varchar(100)	NO		NULL	
	Gender	varchar(10)	NO		NULL	
	Designation	varchar(100)	NO		NULL	
	Mobile_No	varchar(20)	NO	UNI	NULL	
	DOB	varchar(50)	NO		NULL	

b. Inserting value to check default constraint

```
46 • insert into Members values (105,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")
47 #
48
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:31:51	insert into Members values (105,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")	Error Code: 1062. Duplicate entry '7891492201' for key 'members.Mobile_No'	0.000 sec

3. PRIMARY KEY - NOT NULL and UNIQUE

a. Primary Key Constraint

Inserting same value for primary key field

```
48 • insert into Members values (100,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")
49 #
50
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:34:18	insert into Members values (100,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")	Error Code: 1062. Duplicate entry '100' for key 'members.PRIMARY'	0.000 sec

b. Inserting NULL value for primary key field

```
50 • insert into Members values (NULL,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")
51 #
52
53
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:35:29	insert into Members values (NULL,"Mudit Gupta", "Male", "Member", "7891492201","11/09/1998")	Error Code: 1048. Column 'MembershipID' cannot be null	0.000 sec

4. FOREIGN KEY - Uniquely identifies a row/record in another table

a. Foreign Key Constraint

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

```
55 ALTER TABLE Members
56 MODIFY COLUMN fk_events_id int;
57
58 ALTER TABLE Members
59 ADD FOREIGN KEY (fk_events_id) REFERENCES Events(EventID);
60
61 desc Members;
```

Field	Type	Null	Key	Default	Extra
MembershipID	int	NO	PRI		
Name	varchar(100)	NO			
Gender	varchar(10)	NO			
Designation	varchar(100)	NO			
Mobile_No	varchar(20)	NO	UNI		
DOB	varchar(30)	NO			
fk_events_id	int	YES	MUL		

Result 5 x

#	Time	Action	Message	Duration / Fetch
6	10:44:28	ALTER TABLE Members ADD fk_events_id varchar(255)	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.031 sec
7	10:44:41	ALTER TABLE Members ADD FOREIGN KEY (fk_events_id) REFERENCES Events(EventID)	Error Code: 3780. Referencing column 'fk_events_id' and referenced column 'EventID' in foreign key constraint...	0.016 sec
8	10:46:12	ALTER TABLE Members MODIFY COLUMN fk_events_id int	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.062 sec
9	10:46:16	ALTER TABLE Members ADD FOREIGN KEY (fk_events_id) REFERENCES Events(EventID)	5 row(s) affected Records: 5 Duplicates: 0 Warnings: 0	0.046 sec
10	10:48:27	desc Members	7 row(s) returned	0.015 sec / 0.000 sec

b. Inserting value that is not referenced by the related table

insert into Members values (106,"MUdit Gupta", "Male", "Member", "7891492101", "11/09/1998",504);

```
62
63 insert into Members values (106,"MUdit Gupta", "Male", "Member", "7891492101", "11/09/1998",504);
64
65
66
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:50:17	insert into Members values (106,"MUdit Gupta", "Male", "Member", "7891492101", "11/09/1998",504)	Error Code: 1452. Cannot add or update a child row: a foreign key constraint fails ('rgo_db`.`members`, CONSTRAINT...	0.015 sec

5. CHECK - all values in a column are in range values (one/many attributes)

a. Declaring Constraint

ALTER TABLE Donation

ADD CONSTRAINT chk_amount CHECK (Donation_Amount>=500);

b. #Inserting value that violates check constraint

```
65 ALTER TABLE Donation
66 ADD CONSTRAINT chk_amount CHECK (Donation_Amount>=500);
67
68 insert into Donation values(1115,"UDit",400,"15/08/2021");
69
70
71
72
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:55:22	insert into Donation values(1115,"UDit",400,"15/08/2021")	Error Code: 3819. Check constraint 'chk_amount' is violated.	0.000 sec

6. DEFAULT - Sets a default value for a column when no value is specified

```
70 ALTER TABLE Donation
71 ALTER Donation_Amount SET DEFAULT 500;
72
73
74
75
```

Output

#	Time	Action	Message	Duration / Fetch
1	10:56:53	ALTER TABLE Donation ALTER Donation_Amount SET DEFAULT 500	0 row(s) affected Records: 0 Duplicates: 0 Warnings: 0	0.015 sec

69

```

70 • ALTER TABLE Donation
71   ALTER Donation_Amount SET DEFAULT 500;
72 • desc Donation;

```

Result Grid

	Field	Type	Null	Key	Default	Extra
▶	DonorID	int	NO	PRI	NULL	
	Donor_Name	varchar(100)	YES		NULL	
	Donation_Amount	varchar(100)	YES		500	
	Donation_Date	varchar(20)	YES		NULL	

b. Inserting value to check default constraint

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

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Administration Schemas

Information

No object selected

Query 1

```

70 • ALTER TABLE Donation
71   ALTER Donation_Amount SET DEFAULT 500;
72 • desc Donation;
73
74
75 • insert into Donation values(1116,"UDit",DEFAULT,"15/08/2021");
76 • select * from Donation;

```

Result Grid

	DonorID	Donor_Name	Donation_Amount	Donation_Date
▶	1110	UDit	2000	15/08/2021
	1111	Hitai	2000	15/08/2021
	1116	UDit	500	15/08/2021

SQLAdditions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Donation 9 x

Output

Action Output

#	Time	Action	Message	Duration / Fetch
1	10:57:57	desc Donation	4 row(s) returned	0.000 sec / 0.000 sec
2	10:59:56	insert into Donation values(1116,"UDit",DEFAULT,"15/08/2021")	1 row(s) affected	0.015 sec
3	11:00:07	select * from Donation LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec

Object Info Session

Type here to search

30°C 11:00 AM 17-08-2021

7. auto-increment for a field

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

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Administration Schemas

Information: No object selected

Query 1 P2 p3* x

Limit to 1000 rows

```
78 CREATE TABLE Donor (  
79     Dnoid int PRIMARY KEY AUTO_INCREMENT,  
80     LastName varchar(255) NOT NULL,  
81     FirstName varchar(255),  
82     Age int,  
83     Amount varchar(255)  
84 );  
85  
86 ALTER TABLE Donor AUTO_INCREMENT=100;  
87  
88 insert into Donor(LastName,FirstName,Age,Amount) values("Gupta","UDit",22,"2000");  
89  
90 select * from Donor;  
91 #
```

Result Grid

	Dnoid	LastName	FirstName	Age	Amount
▶	100	Gupta	UDit	22	2000
*	NULL	NULL	NULL	NULL	NULL

Donor 11 x

Apply Revert Context H