Experiment No 4A
Aim: Apply Integrity constraints for the specified system
Class: SE Comp
Year: 2020-21
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Integrity Constraints:

- Integrity constraints are a set of rules that are used to maintain the quality of information inside a given record.
- Integrity constraints ensure that the data insertion, updation, and other operations are performed in such a way that data integrity is not affected.
- Thus, integrity constraint is used to guard against accidental damage to the database.

Domain Constraints:

- Domain constraints can be defined as the definition of a valid set of values for an attribute.
- The data type of domain includes string, character, integer, time, date, currency, etc. The value of the attribute must be available in the corresponding domain.

Entity integrity constraints:

- The entity integrity constraint states that primary key value can't be null.
- This is because the primary key value is used to identify individual rows in relation and if the primary key has a null value, then we can't identify those rows.
- A table can contain a null value other than the primary key field.

Referential Integrity Constraints:

- A referential integrity constraint is specified between two tables.
- In the Referential integrity constraints, if a foreign key in Table 1 refers to the Primary Key of Table 2, then every value of the Foreign Key in Table 1 must be null or be available in Table 2.

Key constraints:

- Keys are the entity set that is used to identify an entity within its entity set uniquely.
- An entity set can have multiple keys, but out of which one key will be the primary key. A primary key can contain a unique and null value in the relational table.

Create database Studios and Movies with the following integrity constraints:

1. Enforce primary key constraint on studio_id and movie_title columns
2. Not null constraint on name column
3. Unique constraint on city column
4. Default Constraint on release_date column
5. Check constraint on genre column
6. Referential integrity constraint on studio_id column of movies table

Query:

```
create table studios (
     studio_id int(3) primary key,
     name varchar(20) not null,
     city varchar(20) unique,
     state varchar(30) default 'Maharashtra'
);
```

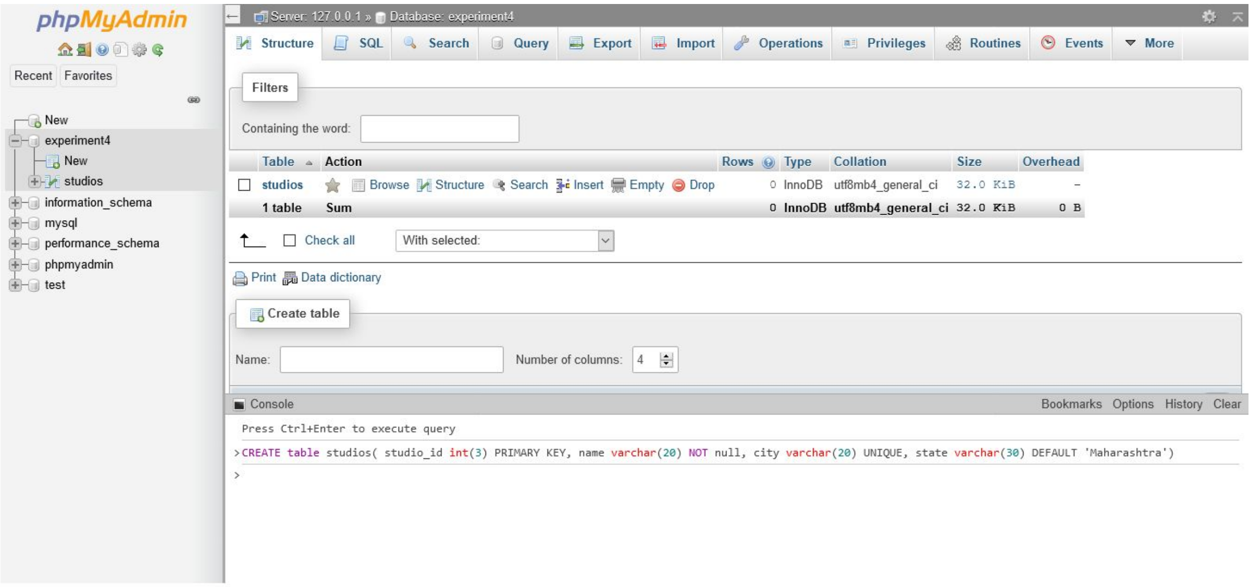


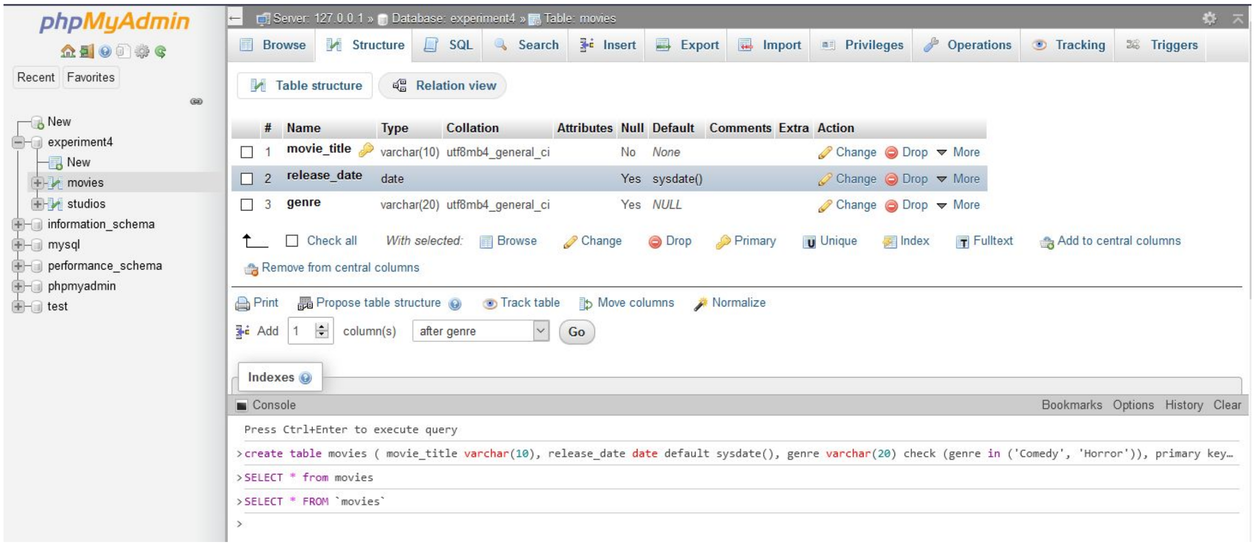
	Table	Action	Rows	Type	Collation	Size	Overhead
□	studios	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	32.0 KiB	-
	1 table	Sum	0	InnoDB	utf8mb4_general_ci	32.0 KiB	0 B

```
Press Ctrl+Enter to execute query
>CREATE table studios( studio_id int(3) PRIMARY KEY, name varchar(20) NOT null, city varchar(20) UNIQUE, state varchar(30) DEFAULT 'Maharashtra')
>
```

Query:

```
create table movies (
     movie_title varchar(10),
     release_date date default sysdate(),
     genre varchar(20) check (genre in ('Comedy', 'Horror')),
     primary key (movie_title)
);

select * from movies
```



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	movie_title	varchar(10)	utf8mb4_general_ci		No	*None*			Change Drop More
□	2	release_date	date			Yes	sysdate()			Change Drop More
□	3	genre	varchar(20)	utf8mb4_general_ci		Yes	*NULL*			Change Drop More

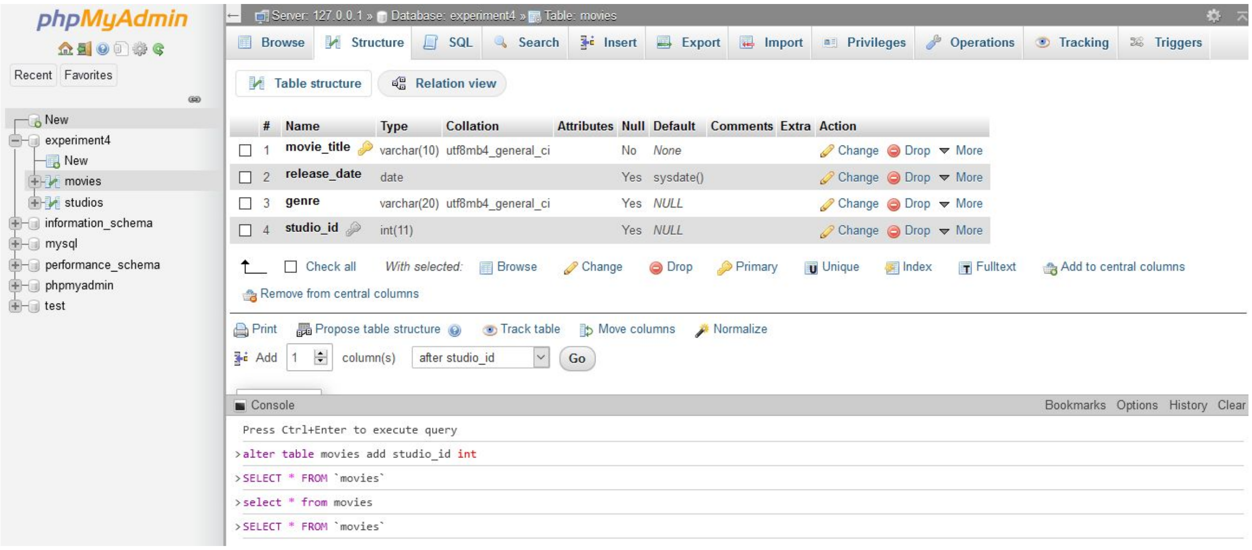
Add 1 column(s) after genre

```
Press Ctrl+Enter to execute query
>create table movies ( movie_title varchar(10), release_date date default sysdate(), genre varchar(20) check (genre in ('Comedy', 'Horror')), primary key…
>SELECT * from movies
>SELECT * FROM `movies`
>
```

Query:

```
alter table movies add foreign key (studio_id) references
studios (studio_id);

select * from movies
```



	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	movie_title	varchar(10)	utf8mb4_general_ci		No	None			Change Drop More
□	2	release_date	date			Yes	sysdate()			Change Drop More
□	3	genre	varchar(20)	utf8mb4_general_ci		Yes	NULL			Change Drop More
□	4	studio_id	int(11)			Yes	NULL			Change Drop More

```
Press Ctrl+Enter to execute query
>alter table movies add studio_id int
>SELECT * FROM `movies`
>select * from movies
>SELECT * FROM `movies`
```

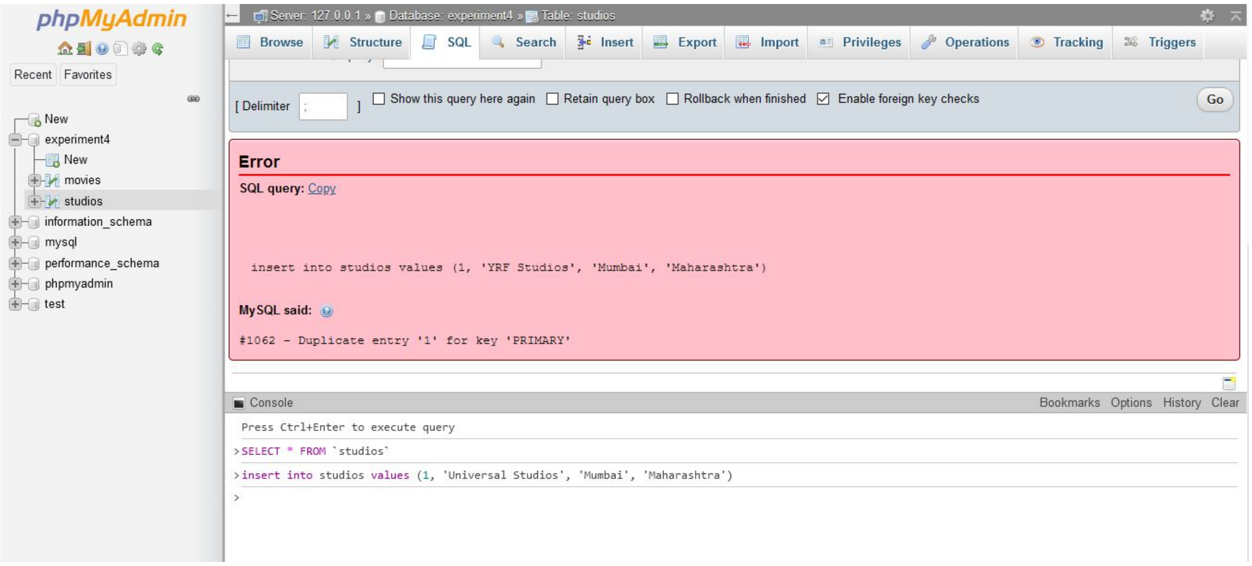
Query:

```
insert into studios values (
     1, ’YRF Studios', 'Mumbai', 'Maharashtra'

);
```

Expected Output:

Should throw an error since primary key entries cannot be duplicate & id ‘1’ already exists



[Delimiter ;] ☐ Show this query here again ☐ Retain query box ☐ Rollback when finished ☑ Enable foreign key checks

Error

SQL query: Copy

```
insert into studios values (1, 'YRF Studios', 'Mumbai', 'Maharashtra')
```

MySQL said:

```
#1062 - Duplicate entry '1' for key 'PRIMARY'
```

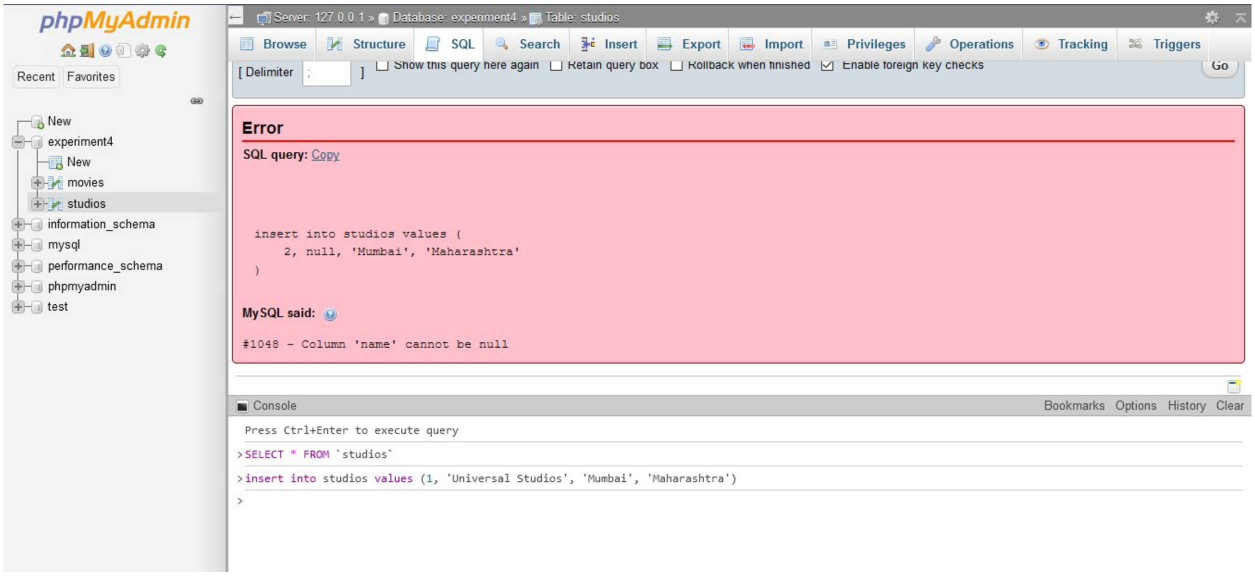
```
Press Ctrl+Enter to execute query
>SELECT * FROM `studios`
>insert into studios values (1, 'Universal Studios', 'Mumbai', 'Maharashtra')
>
```

Query:

```
insert into studios values (
     2, null, 'Mumbai', 'Maharashtra'

);
```

Expected Output:
Should throw an error since the second column has a ‘not null’ constraint



Error

SQL query: Copy

```
insert into studios values (
    2, null, 'Mumbai', 'Maharashtra'
)
```

MySQL said:

```
#1048 - Column 'name' cannot be null
```

```
Press Ctrl+Enter to execute query
>SELECT * FROM `studios`
>insert into studios values (1, 'Universal Studios', 'Mumbai', 'Maharashtra')
>
```

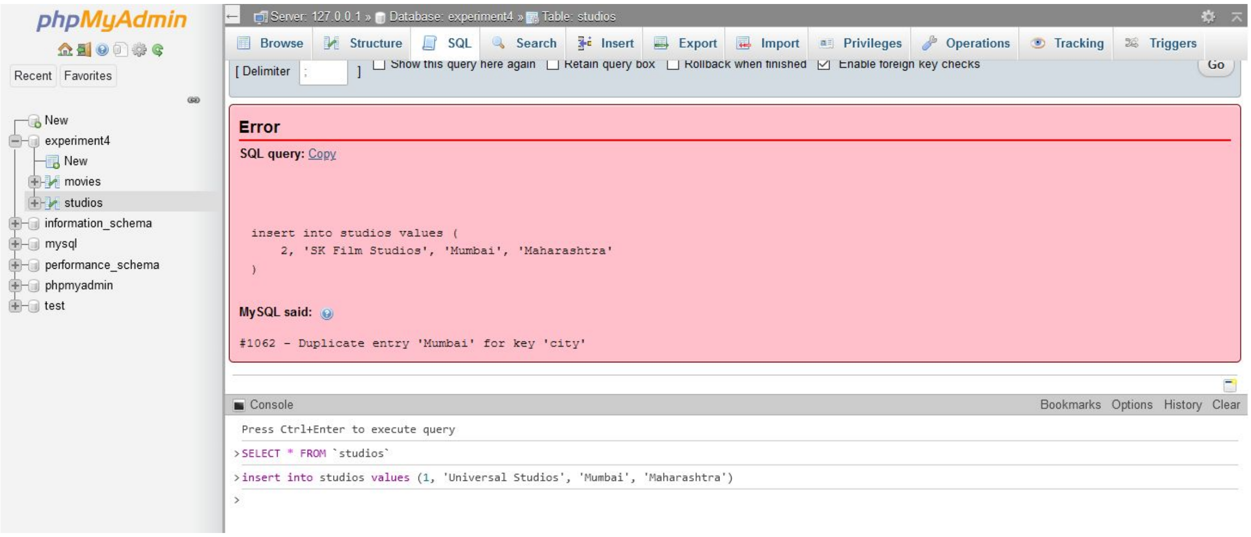
Query:

```
insert into studios values (
     2, ‘SK Film Studios’, 'Mumbai', 'Maharashtra'

);
```

Expected Output:

Should throw an error since the third column is unique and ‘Mumbai’ already exists



phpMyAdmin
Recent Favorites
New
experiment4
New
movies
studios
information_schema
mysql
performance_schema
phpmyadmin
test
Server: 127.0.0.1 » Database: experiment4 » Table: studios
Browse Structure SQL Search Insert Export Import Privileges Operations Tracking Triggers
Go
Console
Bookmarks Options History Clear

[Delimiter ;] □ Show this query here again □ Retain query box □ Rollback when finished ☑ Enable foreign key checks

Error

SQL query: Copy

```
insert into studios values (
    2, 'SK Film Studios', 'Mumbai', 'Maharashtra'
)
```

MySQL said:

```
#1062 - Duplicate entry 'Mumbai' for key 'city'
```

```
Press Ctrl+Enter to execute query
>SELECT * FROM `studios`
>insert into studios values (1, 'Universal Studios', 'Mumbai', 'Maharashtra')
>
```

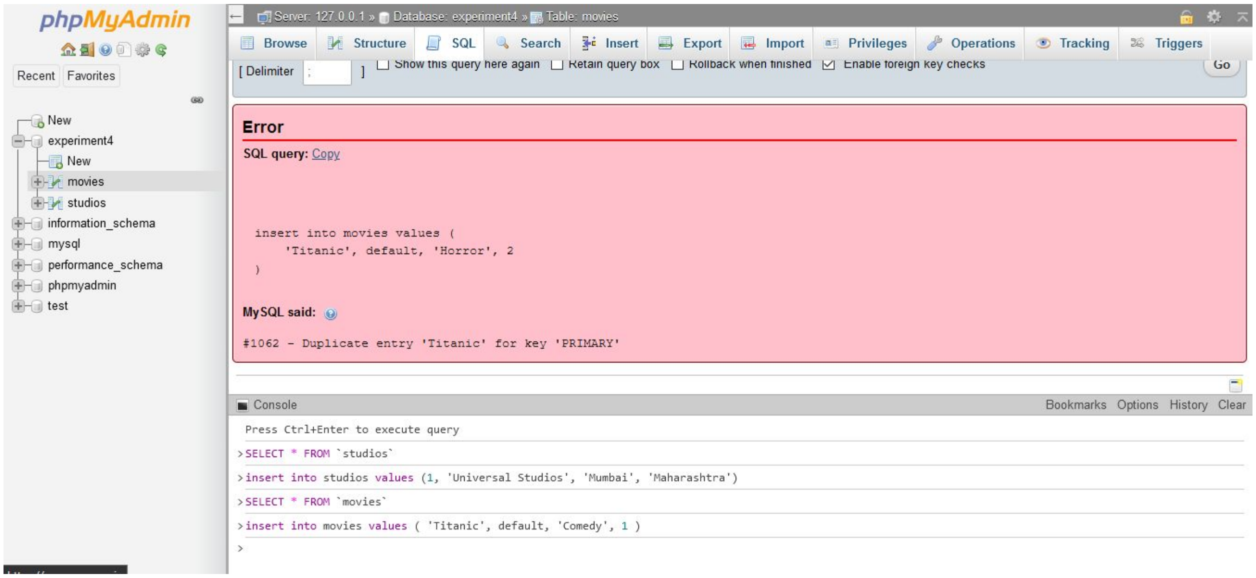
Query:

```
insert into movies values (
     ‘Titanic’, default, ‘Horror’, 2

);
```

Expected Output:

Should throw an error since the movie title is a primary key & ‘Titanic’ already exists



Error

SQL query: Copy

```
insert into movies values (
    'Titanic', default, 'Horror', 2
)
```

MySQL said:

```
#1062 - Duplicate entry 'Titanic' for key 'PRIMARY'
```

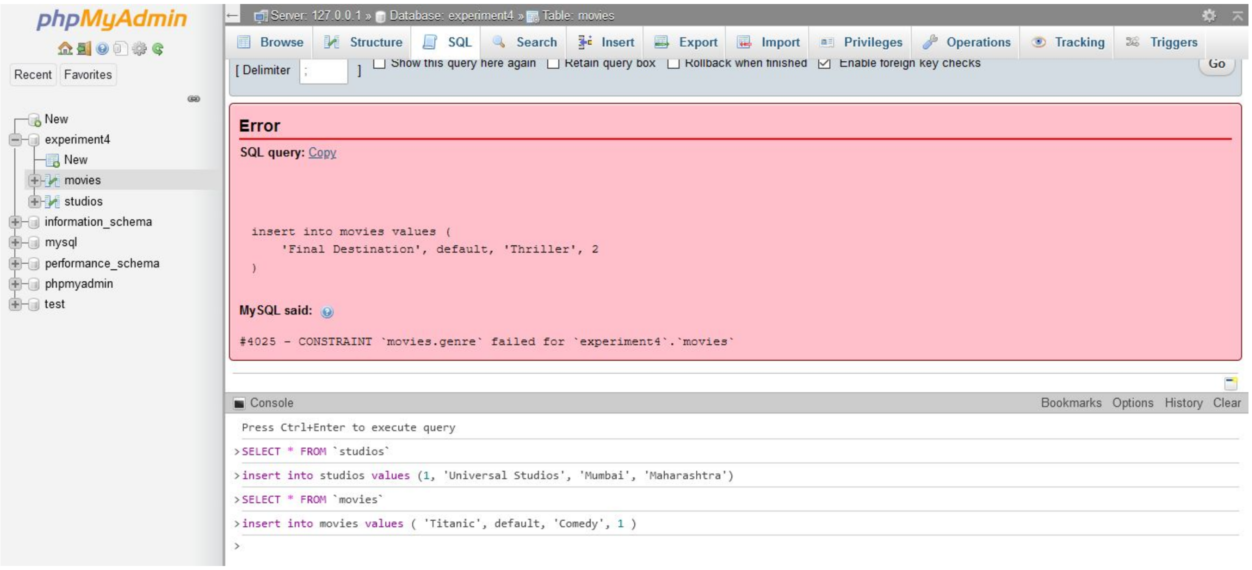
```
Press Ctrl+Enter to execute query
>SELECT * FROM `studios`
>insert into studios values (1, 'Universal Studios', 'Mumbai', 'Maharashtra')
>SELECT * FROM `movies`
>insert into movies values ( 'Titanic', default, 'Comedy', 1 )
>
```

Query:

```
insert into movies values (
     ‘Final Destination’, default, ‘Thriller’, 2

);
```

Expected Output:
Should throw an error since the genre column checks & only allows values where the genre is ‘comedy’ or ‘horror’



Error

SQL query: Copy

```
insert into movies values (
    'Final Destination', default, 'Thriller', 2
)
```

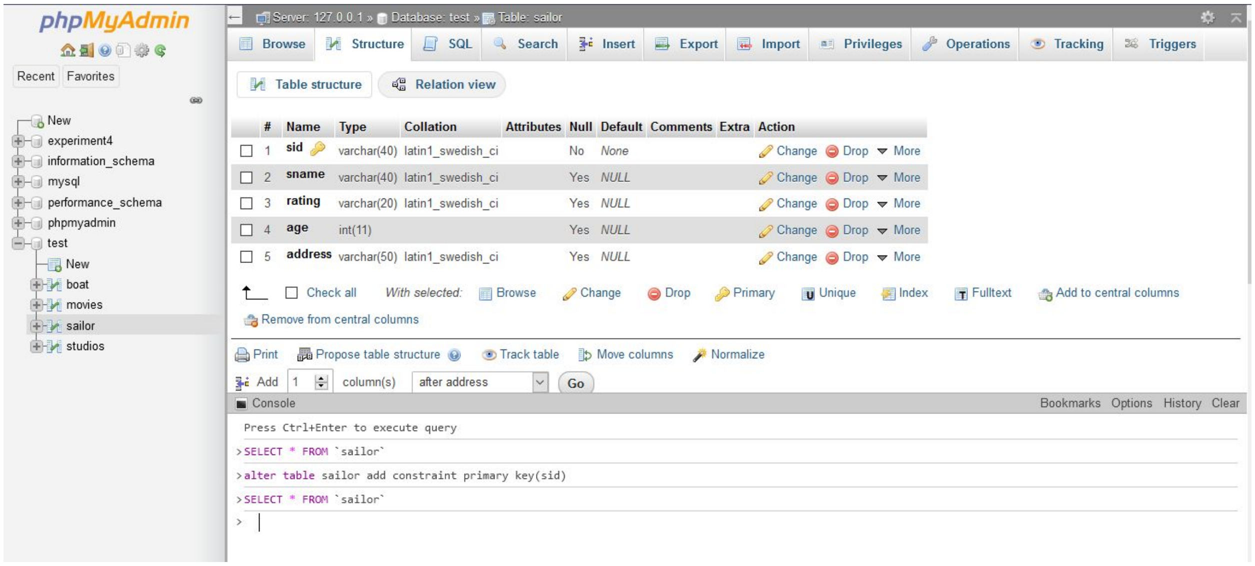
MySQL said:

```
#4025 - CONSTRAINT `movies.genre` failed for `experiment4`.`movies`
```

```
 Press Ctrl+Enter to execute query
>SELECT * FROM `studios`
>insert into studios values (1, 'Universal Studios', 'Mumbai', 'Maharashtra')
>SELECT * FROM `movies`
>insert into movies values ( 'Titanic', default, 'Comedy', 1 )
>
```

Query:

```
alter table sailor add constraint primary key (sid)
```

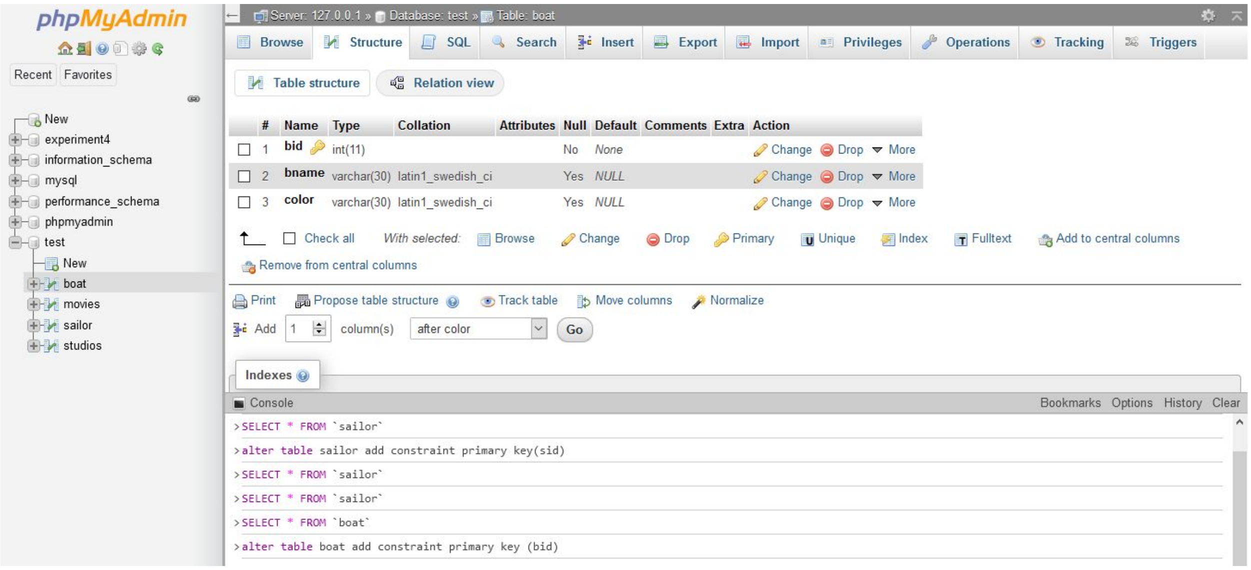


#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	sid	varchar(40)	latin1_swedish_ci		No	None			Change Drop More
2	sname	varchar(40)	latin1_swedish_ci		Yes	NULL			Change Drop More
3	rating	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More
4	age	int(11)			Yes	NULL			Change Drop More
5	address	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More

```
Press Ctrl+Enter to execute query
>SELECT * FROM `sailor`
>alter table sailor add constraint primary key(sid)
>SELECT * FROM `sailor`
>
```

Query:

```
alter table boat add constraint primary key (bid)
```

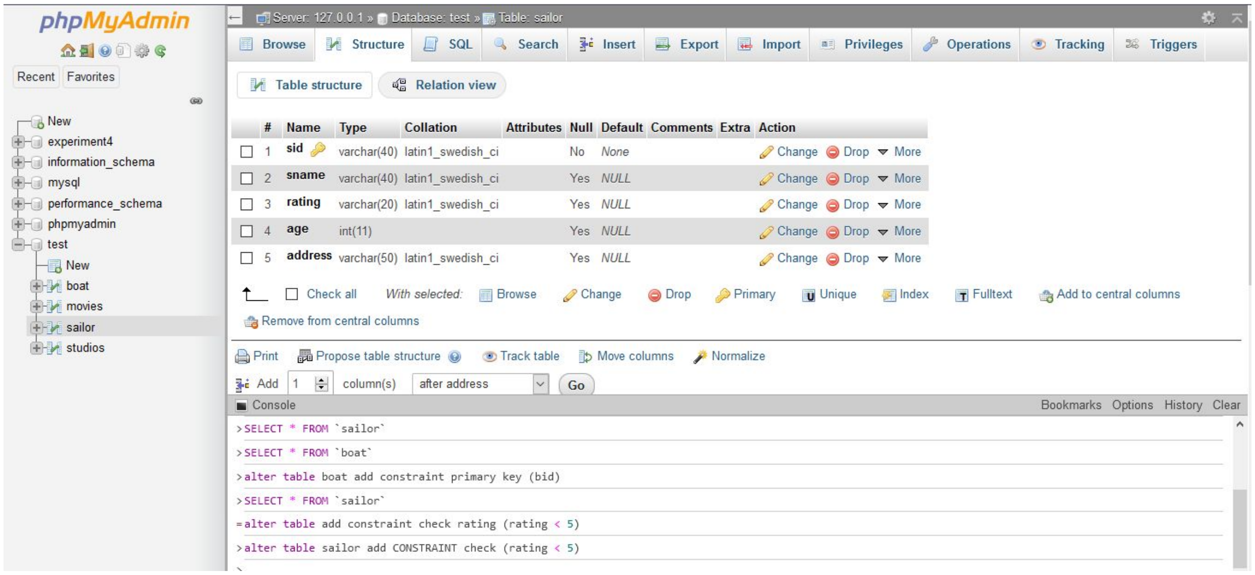


#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	bid	int(11)			No	None			Change Drop More
2	bname	varchar(30)	latin1_swedish_ci		Yes	NULL			Change Drop More
3	color	varchar(30)	latin1_swedish_ci		Yes	NULL			Change Drop More

```
>SELECT * FROM `sailor`
>alter table sailor add constraint primary key(sid)
>SELECT * FROM `sailor`
>SELECT * FROM `sailor`
>SELECT * FROM `boat`
>alter table boat add constraint primary key (bid)
```

Query:

```
alter table sailor add constraint check (rating < 5)
```

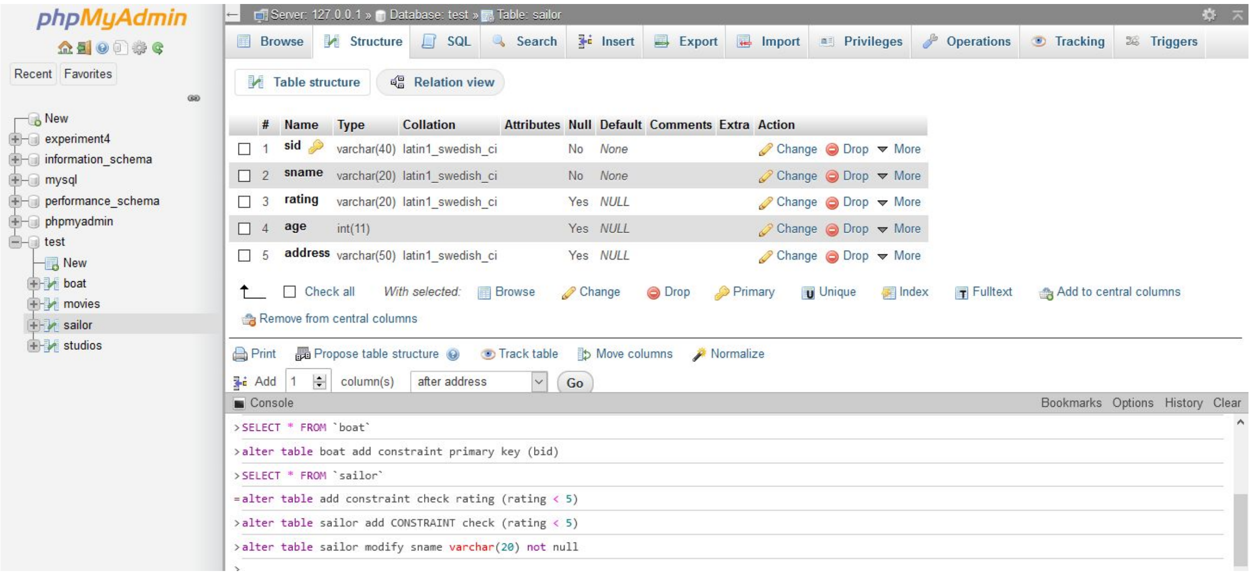


	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	sid	varchar(40)	latin1_swedish_ci		No	None			Change Drop More
□	2	sname	varchar(40)	latin1_swedish_ci		Yes	NULL			Change Drop More
□	3	rating	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More
□	4	age	int(11)			Yes	NULL			Change Drop More
□	5	address	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More

```
>SELECT * FROM `sailor`
>SELECT * FROM `boat`
>alter table boat add constraint primary key (bid)
>SELECT * FROM `sailor`
=alter table add constraint check rating (rating < 5)
>alter table sailor add CONSTRAINT check (rating < 5)
>
```

Query:

```
alter table sailor modify sname varchar(20) not null
```

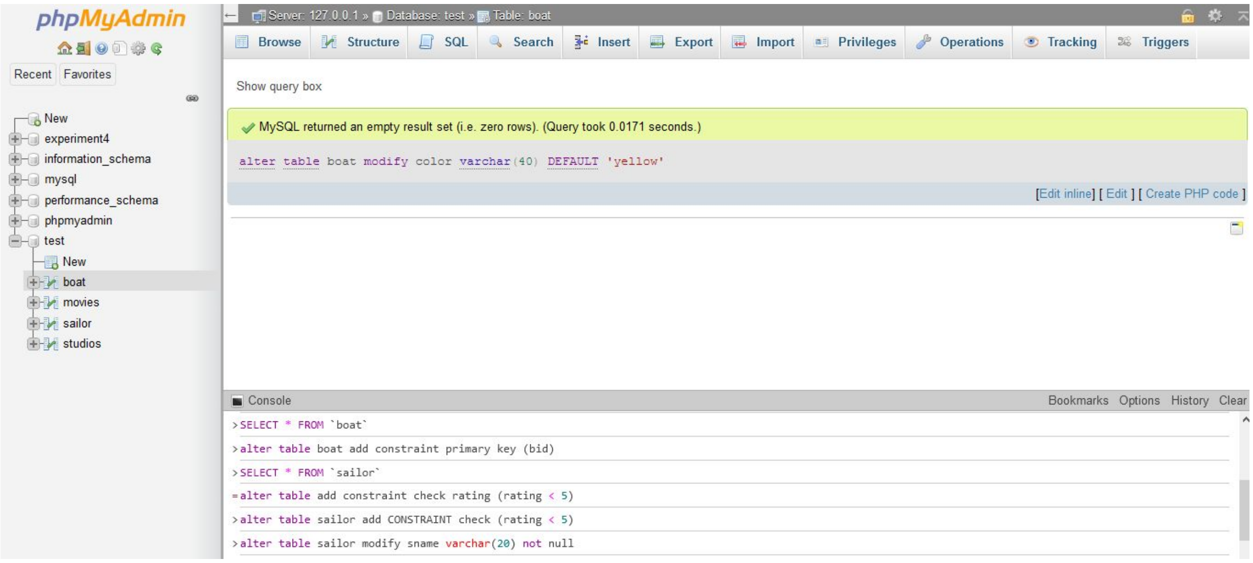


	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
□	1	sid	varchar(40)	latin1_swedish_ci		No	None			Change Drop More
□	2	sname	varchar(20)	latin1_swedish_ci		No	None			Change Drop More
□	3	rating	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More
□	4	age	int(11)			Yes	NULL			Change Drop More
□	5	address	varchar(50)	latin1_swedish_ci		Yes	NULL			Change Drop More

```
>SELECT * FROM `boat`
>alter table boat add constraint primary key (bid)
>SELECT * FROM `sailor`
=alter table add constraint check rating (rating < 5)
>alter table sailor add CONSTRAINT check (rating < 5)
>alter table sailor modify sname varchar(20) not null
>
```

Query:

```
alter table boat modify color varchar(40) default 'yellow'
```



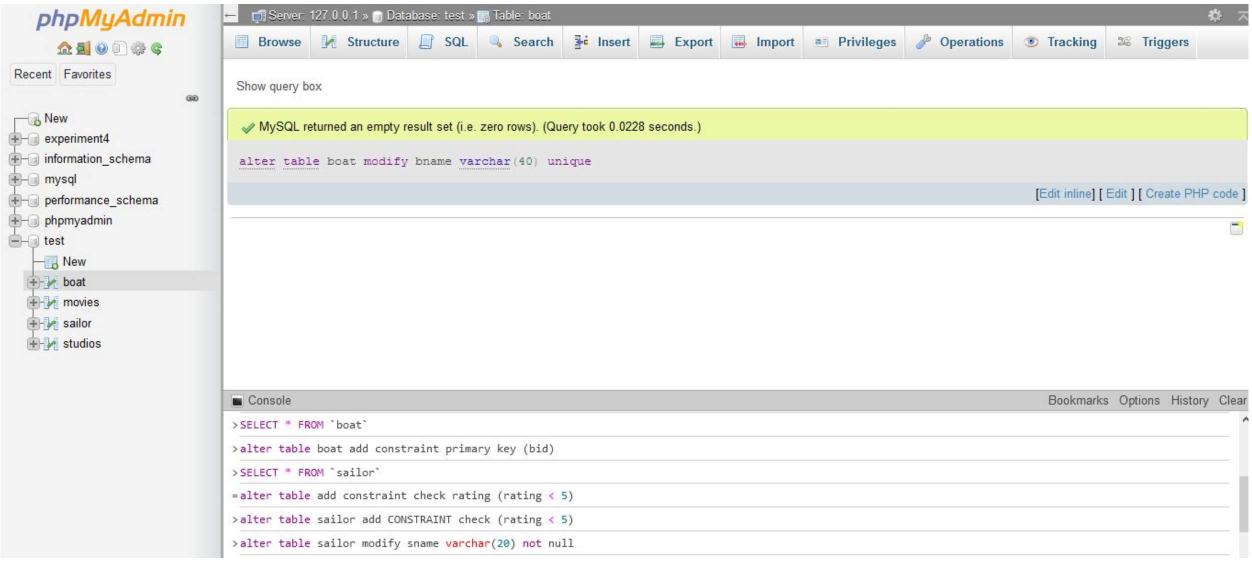
✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0171 seconds.)

```
alter table boat modify color varchar(40) DEFAULT 'yellow'
```

```
>SELECT * FROM `boat`
>alter table boat add constraint primary key (bid)
>SELECT * FROM `sailor`
=alter table add constraint check rating (rating < 5)
>alter table sailor add CONSTRAINT check (rating < 5)
>alter table sailor modify sname varchar(20) not null
```

Query:

```
alter table boat modify bname varchar(40) unique
```



✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0228 seconds.)

```
alter table boat modify bname varchar(40) unique
```

```
>SELECT * FROM `boat`
>alter table boat add constraint primary key (bid)
>SELECT * FROM `sailor`
=alter table add constraint check rating (rating < 5)
>alter table sailor add CONSTRAINT check (rating < 5)
>alter table sailor modify sname varchar(20) not null
```