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ASSIGNMENT 2:
(LIBRARY SYSTEM) :

PROBLEM STATEMENT:

Book(**Book_id,** Title, Author, Subject, Price)

Borrower(**B_id**, B_name, Addr, Contact, Age)

Borrows(**Book_id, B_id**, Date_of_issue, Date_of_return, Fine)

Create the above tables with appropriate SQL commands. Define all integrity constraints and enter sufficient data. Write SQL commands for following queries and give the output for each query.

i) Find out the books with maximum price.
ii) Find out the books of Computer Science with maximum price.
iii) Find out the total no. of books under each subject in the above database.
iv) Find out the total no. of books priced above 500 under each subject in the database.
v) Find out the subject of the book for which more than or equal to two books exists in the database.
vi) Display the average age of the borrowers whose name starts with 'S'.
vii) Display borrower name who lives in Kolkata
viii) Display the title of Books whose author's name is of 5 characters.
ix) Display the title of Books whose author's name's 3rd letter is 't'.

SOLUTION:

- ***DATABASE CREATION AND USE:***

```
mysql> create database first4;

Query OK, 1 row affected (0.00 sec)
```

```
mysql> use first4;
Database changed
```

TABLE CREATION:

- **BOOK**

```
mysql> create table Book
   -> (
   -> Book_id varchar(7) primary key,
   -> Title varchar(20),
   -> Author varchar(20),
   -> Subject varchar(20),
   -> Price int(6)
   -> );
Query OK, 0 rows affected (0.09 sec)
```

- **BORROWER**

```
mysql> create table Borrower
   -> (
   -> B_id varchar(5) primary key,
   -> B_name varchar(20) not null,
   -> Addr varchar(10),
   -> Contact bigint(15),
   -> Age int(3)
   -> );
Query OK, 0 rows affected (0.14 sec)
```

- **BORROWS**

```
mysql> create table Borrows
   -> (
   -> Book_id varchar(7) references Book,
   -> B_id varchar(5) references Borrower,
   -> Date_of_issue date,
   -> Date_of_return date,
   -> Fine int(5)
   -> );
Query OK, 0 rows affected (0.05 sec)
```

INTIGRITY CONSTRAINTS:

- **BOOK**

```
mysql> desc Book;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| Book_id | varchar(7)  | NO   | PRI | NULL    |       |
| Title   | varchar(20) | YES  |     | NULL    |       |
| Author  | varchar(20) | YES  |     | NULL    |       |
| Subject | varchar(10) | YES  |     | NULL    |       |
| Price   | int(6)      | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

- **BORROWER**

```
mysql> desc Borrower;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| B_id    | varchar(5)  | NO   | PRI | NULL    |       |
| B_name  | varchar(20) | NO   |     | NULL    |       |
| Addr    | varchar(10) | YES  |     | NULL    |       |
| Contact | int(15)     | YES  |     | NULL    |       |
| Age     | int(3)      | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
5 rows in set (0.02 sec)
```

- **BORROWS**

```
mysql> desc Borrows;
+----------------+------------+------+-----+---------+-------+
| Field          | Type       | Null | Key | Default | Extra |
+----------------+------------+------+-----+---------+-------+
| Book_id        | varchar(7) | YES  |     | NULL    |       |
| B_id           | varchar(5) | YES  |     | NULL    |       |
| Date_of_issue  | date       | YES  |     | NULL    |       |
| Date_of_return | date       | YES  |     | NULL    |       |
| Fine           | int(5)     | YES  |     | NULL    |       |
+----------------+------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

TUPLE INSERTION:

- **BOOK**

```
mysql> insert into Book values('bk01','Initial
Mathamatics','Patra','Mathematics',800);
Query OK, 1 row affected (0.13 sec)

mysql> insert into Book values('bk02','Funda of Stats','Matariya','Statistics',800);
Query OK, 1 row affected (0.13 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Book;
+---------+----------------------+----------+------------------+-------+
| Book_id | Title                | Author   | Subject          | Price |
+---------+----------------------+----------+------------------+-------+
| bk01    | Initial Mathamatics  | Patra    | Mathematics      |   800 |
| bk02    | Funda of Stats       | Matariya | Statistics       |   800 |
| bk03    | Computer A B C D     | Sinha    | Computer Science |   720 |
| bk04    | Calculas Analysis    | Abel     | Mathematics      |   650 |
| bk05    | Maths Analysis       | Rudin    | Mathematics      |   330 |
| bk06    | Computer Fundamental | Simona   | Computer Science |   470 |
+---------+----------------------+----------+------------------+-------+
6 rows in set (0.00 sec)
```

- **BORROWER**

```
 mysql> insert into Borrower values('bo01','Saheb','Kolkata',9847752101,25);
Query OK, 1 row affected (0.06 sec)

mysql> insert into Borrower values('bo02','Smita','Asam',7454845210,30);
Query OK, 1 row affected (0.11 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Borrower;
+------+--------+------------+------------+------+
| B_id | B_name | Addr       | Contact    | Age  |
+------+--------+------------+------------+------+
| bo01 | Saheb  | Kolkata    | 9847752101 |   25 |
| bo02 | Smita  | Asam       | 7454845210 |   30 |
| bo03 | Aman   | Kolkata    | 9899845120 |   55 |
| bo04 | Kabita | Kolkata    | 8958412561 |   45 |
| bo05 | Sima   | Krishnagar | 8899747152 |   65 |
| bo06 | Ananta | Bidhanpur  | 9932254125 |   20 |
+------+--------+------------+------------+------+
6 rows in set (0.00 sec)
```

- **BORROWS**

```
mysql> insert into Borrows values('bk05','b02','2019-05-14','2019-06-21',31);
Query OK, 1 row affected (0.13 sec)

mysql> insert into Borrows values('bk04','b01','2018-07-14','2018-07-30',9);
Query OK, 1 row affected (0.06 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from Borrows;
+---------+------+---------------+----------------+------+
| Book_id | B_id | Date_of_issue | Date_of_return | Fine |
+---------+------+---------------+----------------+------+
| bk05    | b02  | 2019-05-14    | 2019-06-21     |   31 |
| bk04    | b01  | 2018-07-14    | 2018-07-30     |    9 |
| bk05    | b03  | 2019-05-14    | 2019-06-21     |   62 |
| bk02    | b06  | 2018-11-22    | 2019-01-21     |   53 |
| bk05    | b02  | 2019-05-15    | 2019-06-21     |   30 |
| bk05    | b02  | 2019-10-19    | 2019-10-26     |    0 |
+---------+------+---------------+----------------+------+
```

6 rows in set (0.00 sec)

QUERY EXECUTION:

i> mysql> select * from Book where price in(select max(price) from Book);

```
+---------+--------------------+----------+-------------+-------+
| Book_id | Title              | Author   | Subject     | Price |
+---------+--------------------+----------+-------------+-------+
| bk01    | Initial Mathamatics | Patra    | Mathematics |   800 |
| bk02    | Funda of Stats      | Matariya | Statistics  |   800 |
+---------+--------------------+----------+-------------+-------+
```

2 rows in set (0.05 sec)

ii> mysql> select * from Book where Subject like 'Computer Science' and price in(select max(price) from Book where subject like 'Computer Science');

```
+---------+-----------------+--------+-----------------+-------+
| Book_id | Title           | Author | Subject         | Price |
+---------+-----------------+--------+-----------------+-------+
| bk03    | Computer A B C D | Sinha  | Computer Science |   720 |
+---------+-----------------+--------+-----------------+-------+
```

1 row in set (0.00 sec)

iii> mysql> select Subject,count(Book_id) 'Total number of Books' from Book group by Subject;

```
+-----------------+----------------------+
| Subject         | Total number of Books |
+-----------------+----------------------+
| Computer Science |                    2 |
| Mathematics     |                    3 |
| Statistics      |                    1 |
+-----------------+----------------------+
```

3 rows in set (0.11 sec)

iv> mysql> select Subject,count(Book_id) 'Total number of Books where price>500' from Book where price>500 group by Subject;

```
+-----------------+----------------------+
| Subject         | Total number of Books where price>500 |
+-----------------+----------------------+
| Computer Science |                    1 |
| Mathematics     |                    2 |
| Statistics      |                    1 |
+-----------------+----------------------+
```

3 rows in set (0.00 sec)

v> mysql> select Subject 'Subject for which more than equal to 2 books exists in the database',count(Book_id) from Book group by Subject having count(Book_id)>=2;

```
+-----------------------------------------------------------------+----------------+
| Subject for which more than equal to 2 books exists in the database | count(Book_id) |
```

```
+-----------------------------------------------------------------+----------+
| Computer Science                                                |        2 |
| Mathematics                                                     |        3 |
+-----------------------------------------------------------------+----------+
2 rows in set (0.00 sec)
```

vi> mysql> select avg(age) 'Average age' from Borrower where b_name like 'S%';

```
+-------------+
| Average age |
+-------------+
|     40.0000 |
+-------------+
1 row in set (0.02 sec)
```

vii> mysql> select b_name from Borrower where Addr like 'Kolkata';

```
+--------+
| b_name |
+--------+
| Saheb  |
| Aman   |
| Kabita |
+--------+
3 rows in set (0.00 sec)
```

viii> mysql> select title from book where author like '_____';

```
+--------------------+
| title              |
+--------------------+
| Initial Mathamatics |
| Computer A B C D    |
| Maths Analysis      |
+--------------------+
3 rows in set (0.00 sec)
```

ix> mysql> select title from book where author like '__t%';

```
+--------------------+
| title              |
+--------------------+
| Initial Mathamatics |
| Funda of Stats      |
+--------------------+
2 rows in set (0.00 sec)
```