

DBMS LABORATORY WITH MINI PROJECT

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2017-2018)

SEMESTER – V

Subject Code: **17CSL58**

IA Marks: **40**

Exam Marks: **60**

Exam Hours: **03**

Program - 1

Consider the following schema for a Library Database:

BOOK (Book_id, Title, Publisher_Name, Pub_Year)

BOOK_AUTHORS (Book_id, Author_Name)

PUBLISHER (Name, Address, Phone)

BOOK_COPIES (Book_id, Branch_id, No-of_Copies)

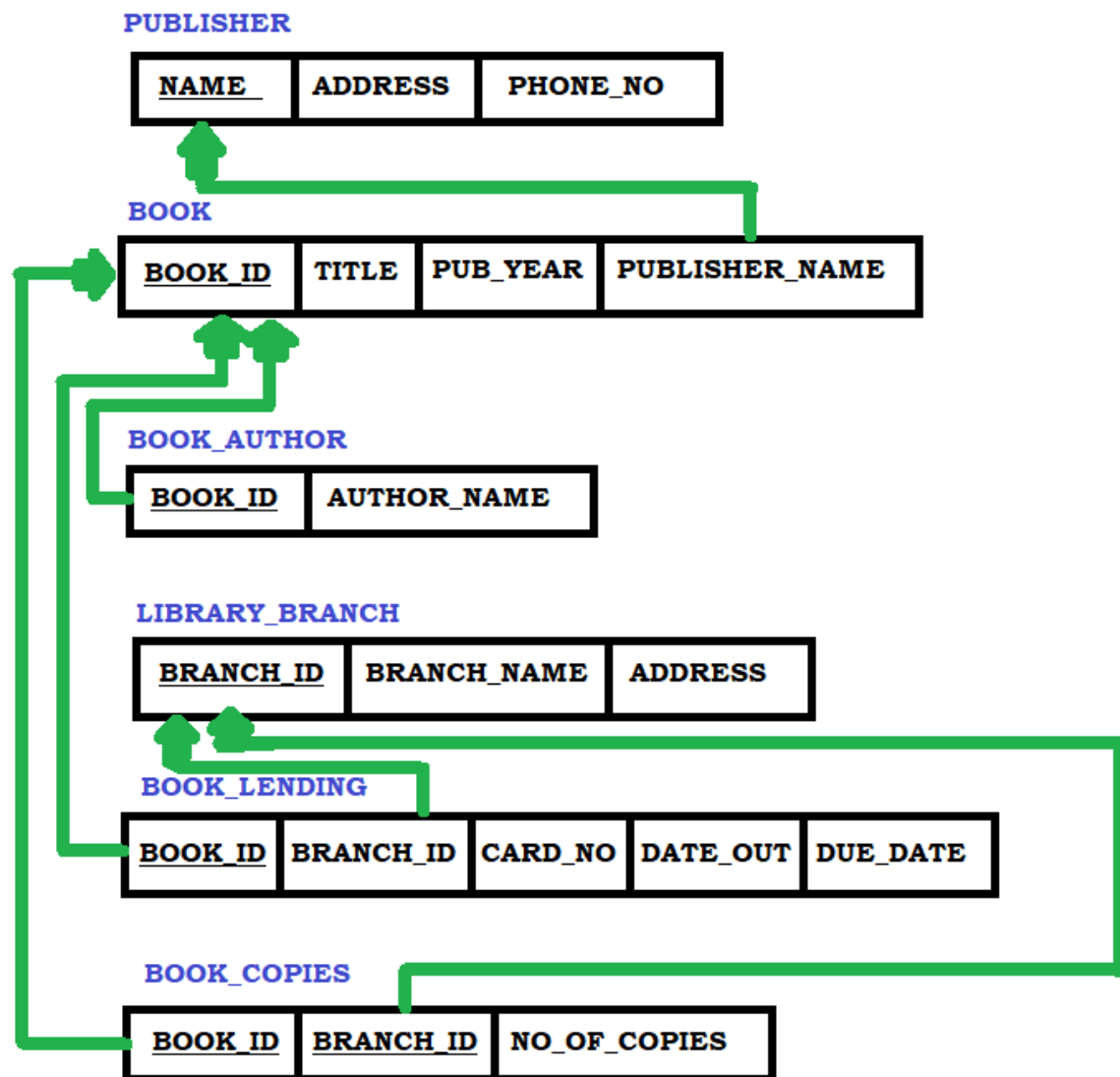
BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date)

LIBRARY_BRANCH (Branch_id, Branch_Name, Address)

Write SQL queries to:

1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.
2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.
3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
5. Create a view of all books and its number of copies that are currently available in the Library.

SCHEMA DIAGRAM:



STEPS TO OPEN THE ORACLE DATABASE – 10G EXPRESS EDITION

Step 1: Open the Browser (Preferred Chrome).

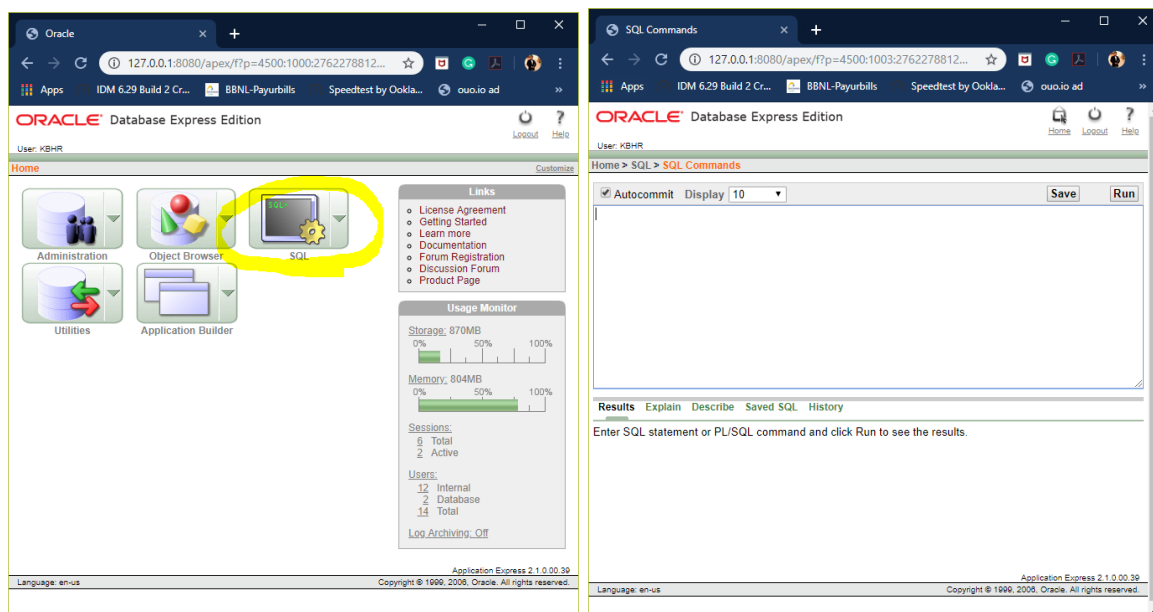
Step 2: <http://127.0.0.1:8080/> Enter the link on the browser.

Step 3: login with your id and password (finding difficulty in login in go to the link to know in-depth details

https://hemanthrajhemu.github.io/FutureVisionBIE/WP/5CSE/DBMS_LAB_INFO.html

(Note Username is the system by default & Password is the passkey you entered in the installation)

Step 4: Now click on SQL->SQL Commands. This is the place where we execute the SQL Commands.



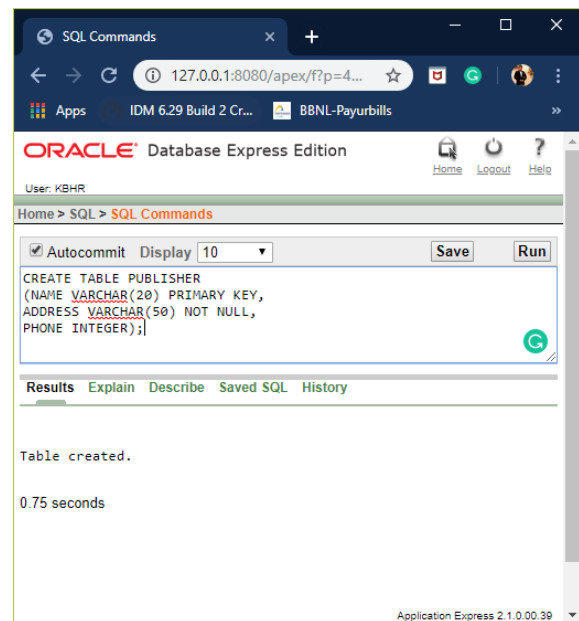
Step 5: you are in SQL Command Now you can Create table, create view, Run Queries here & lot more.

Create Table: (Follow the Schema Diagram in Creating the Data Base)

1. Create Table for PUBLISHER

CREATE TABLE PUBLISHER
(NAME VARCHAR(20) PRIMARY KEY,
ADDRESS VARCHAR(50) NOT NULL,
PHONE INTEGER);

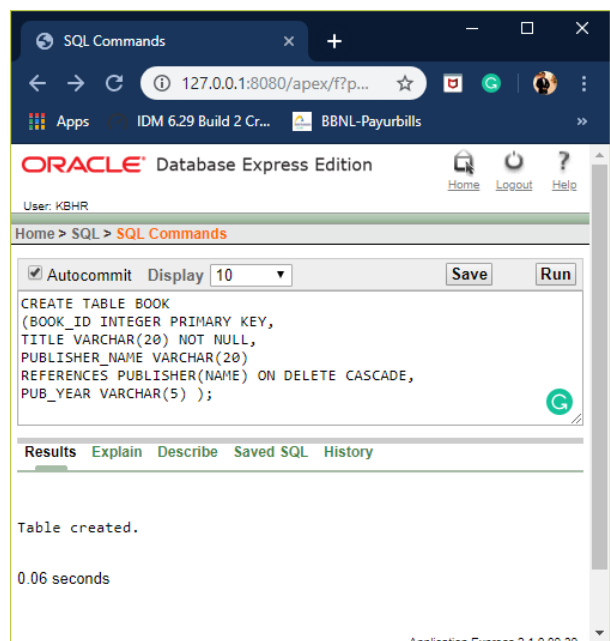
NOW RUN.



2. Create Table for BOOK

CREATE TABLE BOOK
(BOOK_ID INTEGER PRIMARY KEY,
TITLE VARCHAR(20) NOT NULL,
PUBLISHER_NAME VARCHAR(20)
REFERENCES PUBLISHER(NAME)
ON DELETE CASCADE,
PUB_YEAR VARCHAR(5));

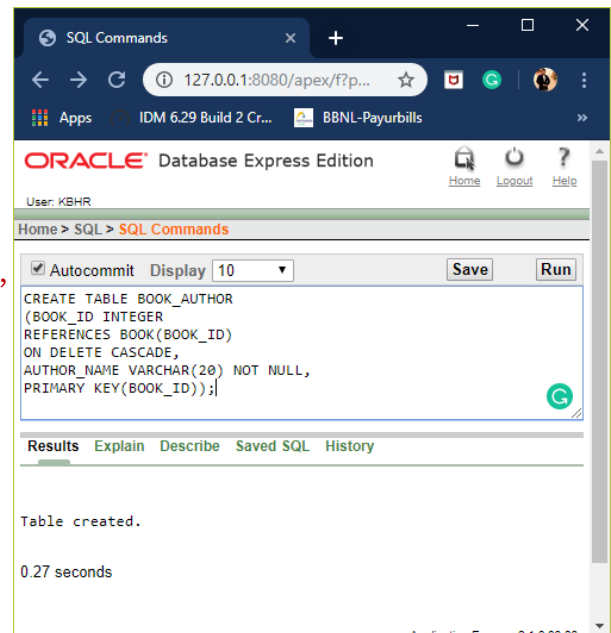
Now Click on Run.



3. Create Table for BOOK_AUTHOR

```
CREATE TABLE BOOK_AUTHOR
(BOOK_ID INTEGER
REFERENCES BOOK(BOOK_ID)
ON DELETE CASCADE,
AUTHOR_NAME VARCHAR(20) NOT NULL,
PRIMARY KEY(BOOK_ID));
```

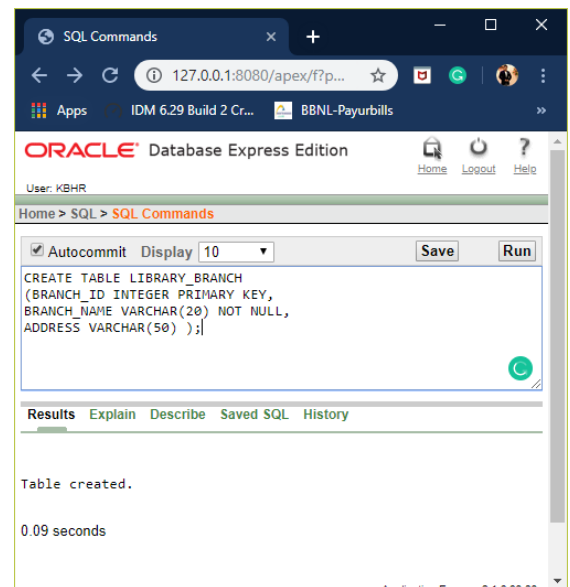
Click on Run.



4. Create Table for LIBRARY_BRANCH

```
CREATE TABLE LIBRARY_BRANCH
(BRANCH_ID INTEGER PRIMARY KEY,
BRANCH_NAME VARCHAR(20) NOT NULL,
ADDRESS VARCHAR(50) );
```

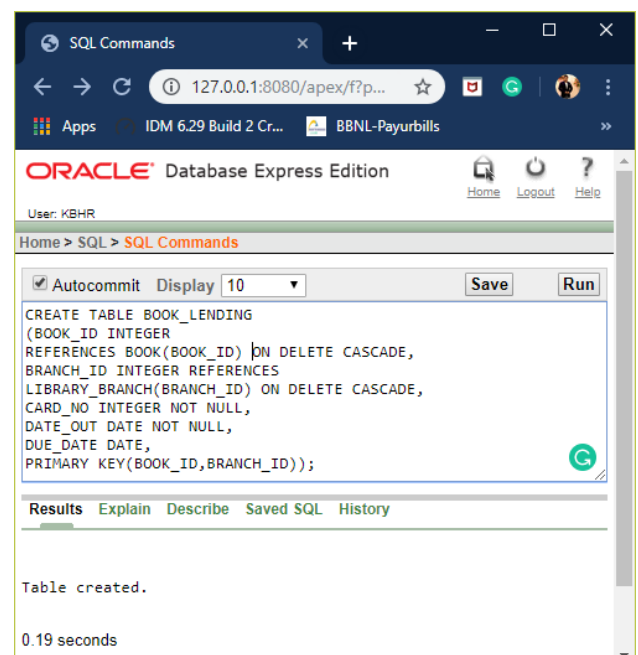
Click on Run.



5. Create Table for BOOK_LENDING

```
CREATE TABLE BOOK_LENDING
(BOOK_ID INTEGER
REFERENCES BOOK(BOOK_ID)
ON DELETE CASCADE,
BRANCH_ID INTEGER
REFERENCES
LIBRARY_BRANCH(BRANCH_ID)
ON DELETE CASCADE,
CARD_NO INTEGER NOT NULL,
DATE_OUT DATE NOT NULL,
DUE_DATE DATE,
PRIMARY KEY(BOOK_ID,BRANCH_ID));
```

Click on Run.



6. Create Table for BOOK_COPIES

```
CREATE TABLE BOOK_COPIES  
(BOOK_ID INTEGER  
REFERENCES BOOK(BOOK_ID)  
ON DELETE CASCADE,  
BRANCH_ID INTEGER  
REFERENCES  
LIBRARY_BRANCH(BRANCH_ID),  
NO_OF_COPIES INTEGER,  
PRIMARY KEY(BOOK_ID,BRANCH_ID) );
```

Click on Run.

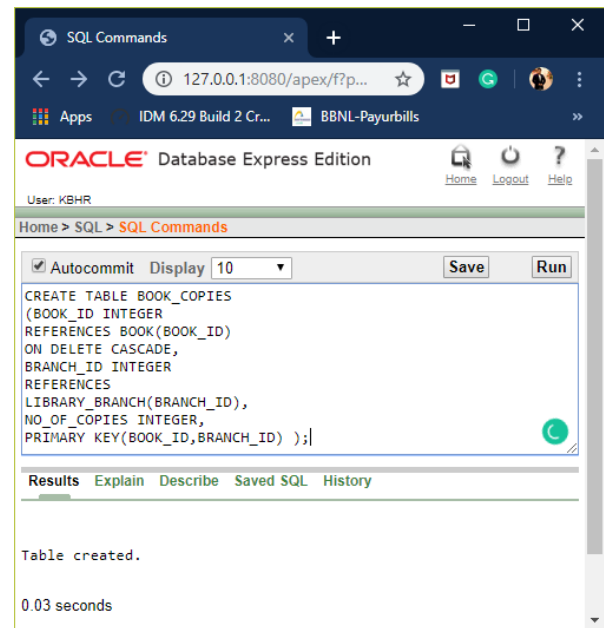


TABLE DESCRIPTION

1. DESC PUBLISHER;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window has the command `DESC PUBLISHER;` entered. The results are displayed in a table format.

Object Type: TABLE Object: PUBLISHER

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PUBLISHER	NAME	Varchar2	20	-	-	1	-	-	-
	ADDRESS	Varchar2	50	-	-	-	-	-	-
	PHONE	Number	-	-	0	-	✓	-	-

1 - 3

2. DESC BOOK;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window has the command `DESC BOOK;` entered. The results are displayed in a table format.

Object Type: TABLE Object: BOOK

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BOOK	BOOK_ID	Number	-	-	0	1	-	-	-
	TITLE	Varchar2	20	-	-	-	-	-	-
	PUBLISHER_NAME	Varchar2	20	-	-	-	✓	-	-
	PUB_YEAR	Varchar2	5	-	-	-	✓	-	-

1 - 4

3. DESC BOOK_AUTHOR;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the command `DESC BOOK_AUTHOR;`. The results are displayed in a table format.

Object Type: TABLE Object: BOOK_AUTHOR

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BOOK_AUTHOR	BOOK_ID	Number	-	-	0	1	-	-	-
	AUTHOR_NAME	Varchar2	20	-	-	-	-	-	-
									1 - 2

4. DESC LIBRARY_BRANCH;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the command `DESC LIBRARY_BRANCH;`. The results are displayed in a table format.

Object Type: TABLE Object: LIBRARY_BRANCH

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LIBRARY_BRANCH	BRANCH_ID	Number	-	-	0	1	-	-	-
	BRANCH_NAME	Varchar2	20	-	-	-	-	-	-
	ADDRESS	Varchar2	50	-	-	-	✓	-	-
									1 - 3

5. DESC BOOK_LENDING;

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL Commands window displays the command `DESC BOOK_LENDING;`. The results are shown in a table format.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BOOK_LENDING	BOOK_ID	Number	-	-	0	1	-	-	-
	BRANCH_ID	Number	-	-	0	2	-	-	-
	CARD_NO	Number	-	-	0	-	-	-	-
	DATE_OUT	Date	7	-	-	-	-	-	-
	DUE_DATE	Date	7	-	-	-	✓	-	-

1 - 5

6. DESC BOOK_COPIES;

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL Commands window displays the command `DESC BOOK_COPIES;`. The results are shown in a table format.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BOOK_COPIES	BOOK_ID	Number	-	-	0	1	-	-	-
	BRANCH_ID	Number	-	-	0	2	-	-	-
	NO OF COPIES	Number	-	-	0	-	✓	-	-

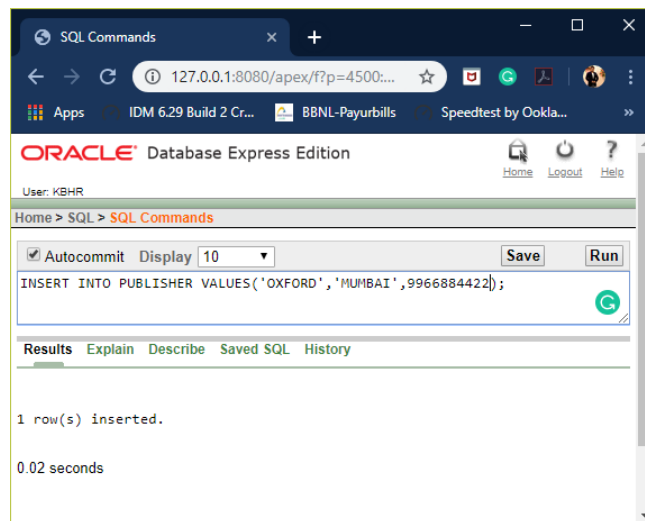
1 - 3

INSERTION OF VALUES TO TABLE

1. VALUES INTO PUBLISHER

INSERT INTO PUBLISHER VALUES(<NAME> , <ADDRESS>, <PHONE>);

```
INSERT INTO PUBLISHER VALUES('PEARSON','NEW DELHI',9996621456);  
INSERT INTO PUBLISHER VALUES('OXFORD','MUMBAI',9966884422);  
INSERT INTO PUBLISHER VALUES('MC GRAW HILL','CHENNAI', 8866333444);  
INSERT INTO PUBLISHER VALUES('O_REILLY','MANGLORE',9898989898);  
INSERT INTO PUBLISHER VALUES('APRESS & DREAMTECH','MAHARASTRA',  
9876549876);
```

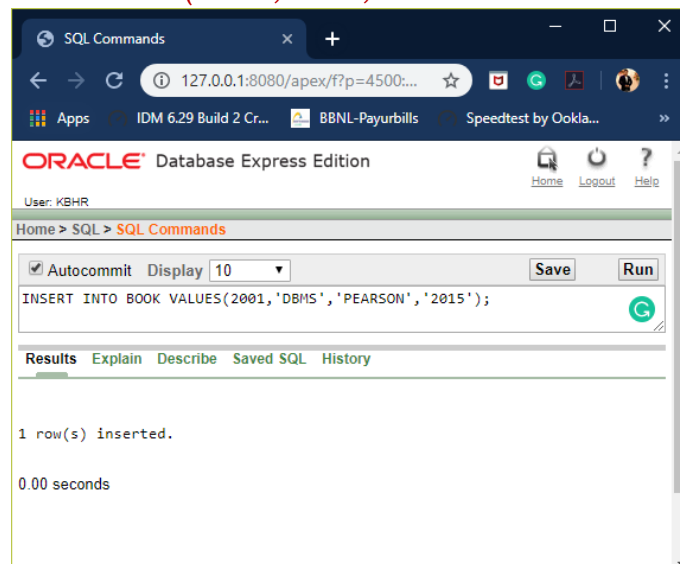


2. VALUES INTO BOOK

INSERT INTO BOOK

VALUES(<BOOK_ID>,<TITLE>,<PUBLISHER_NAME>,<PUB_YEAR>);

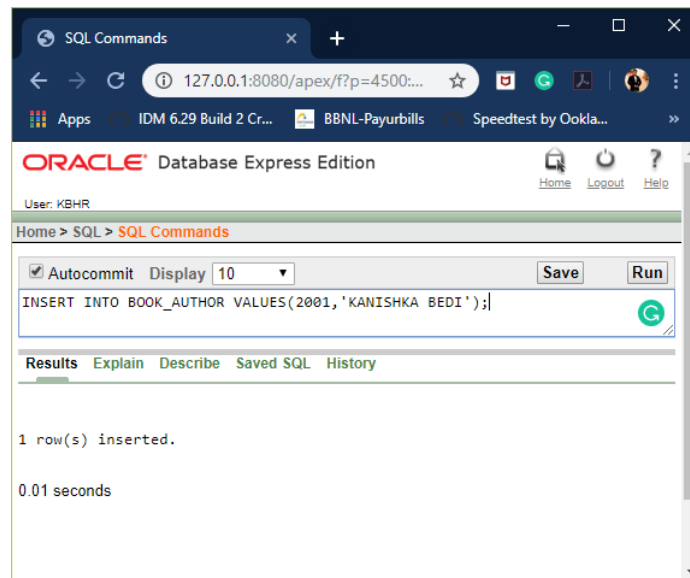
```
INSERT INTO BOOK VALUES(2001,'DBMS','PEARSON','2015');  
INSERT INTO BOOK VALUES(2002,'COMPUTER NETWORKS','OXFORD','2019');  
INSERT INTO BOOK VALUES(2003,'JAVA','MC GRAW HILL','2016');  
INSERT INTO BOOK VALUES(2004,'C PROGRAMMING','O_REILLY','2014');  
INSERT INTO BOOK VALUES(2005,'PHP','APRESS & DREAMTECH','2017');
```



3. VALUES INTO BOOK_AUTHOR

INSERT INTO BOOK_AUTHOR VALUES(<BOOK_ID>,<AUTHOR_NAME>);

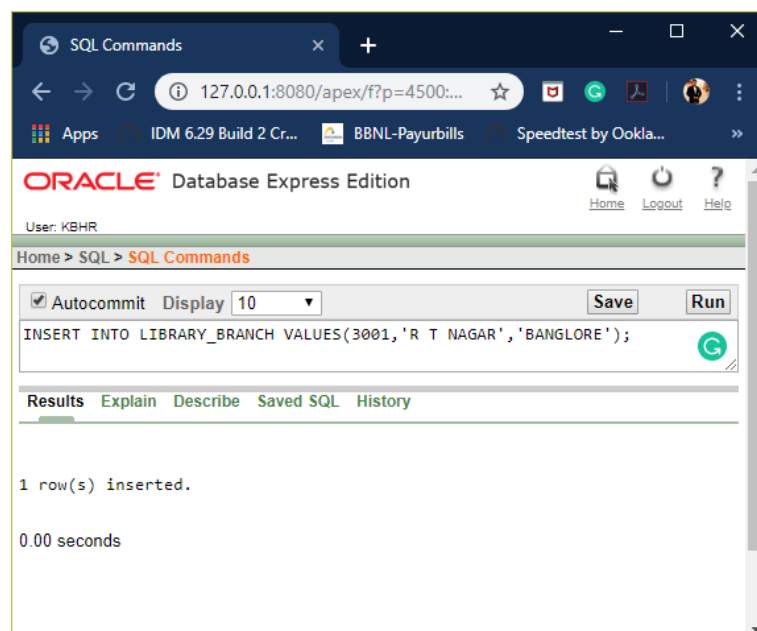
```
INSERT INTO BOOK_AUTHOR VALUES(2001,'KANISHKA BEDI');  
INSERT INTO BOOK_AUTHOR VALUES(2002,'POORNIMA M');  
INSERT INTO BOOK_AUTHOR VALUES(2003,'P C TRIPATHI');  
INSERT INTO BOOK_AUTHOR VALUES(2004,'P N REDDY');  
INSERT INTO BOOK_AUTHOR VALUES(2005,'VISHWA KIRAN');
```



4. VALUES INTO LIBRARY_BRANCH

**INSERT INTO LIBRARY_BRANCH
VALUES(<BRANCH_ID>,<BRANCH_NAME>,<ADDRESS>);**

```
INSERT INTO LIBRARY_BRANCH VALUES(3001,'R T NAGAR','BANGLORE');  
INSERT INTO LIBRARY_BRANCH  
VALUES(3002,'MALESHWARAM','BANGLORE');  
INSERT INTO LIBRARY_BRANCH VALUES(3003,'SECTOR 21','NODIA');  
INSERT INTO LIBRARY_BRANCH VALUES(3004,'KLS INSTITUTE','BELGAUM');  
INSERT INTO LIBRARY_BRANCH VALUES(3005,'YELAHANKA','BANGLORE');
```



5. VALUES INTO BOOK_LENDING

INSERT INTO BOOK_LENDING

VALUES(<BOOK_ID>,<BRANCH_ID>,<CARD_NO>,<DATE_OUT>,<DUE_DATE>);

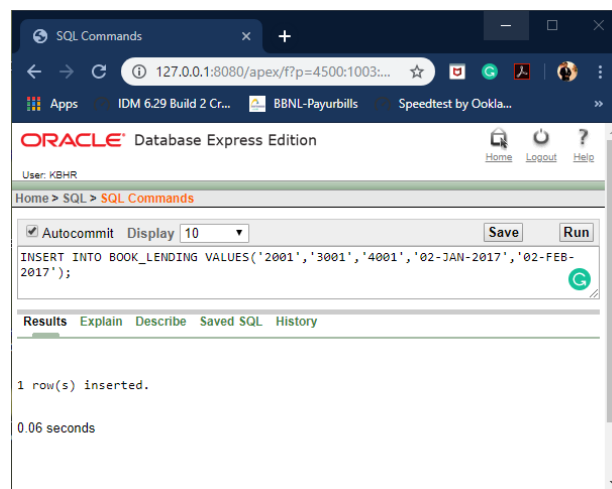
INSERT INTO BOOK_LENDING VALUES('2001','3001','4001','02-JAN-2017','02-FEB-2017');

INSERT INTO BOOK_LENDING VALUES('2002','3001','4001','07-JAN-2017','07-FEB-2017');

INSERT INTO BOOK_LENDING VALUES('2003','3001','4001','10-JAN-2017','10-FEB-2017');

INSERT INTO BOOK_LENDING VALUES('2004','3001','4001','20-JAN-2017','20-FEB-2017');

INSERT INTO BOOK_LENDING VALUES('2005','3002','4005','20-JAN-2017','20-FEB-2017');



6. VALUES INTO BOOK_COPIES

INSERT INTO BOOK_COPIES

VALUES(<BOOK_ID>,<BRANCH_ID>,<NO_OF_COPIES>);

INSERT INTO BOOK_COPIES VALUES(2001,3001,10);

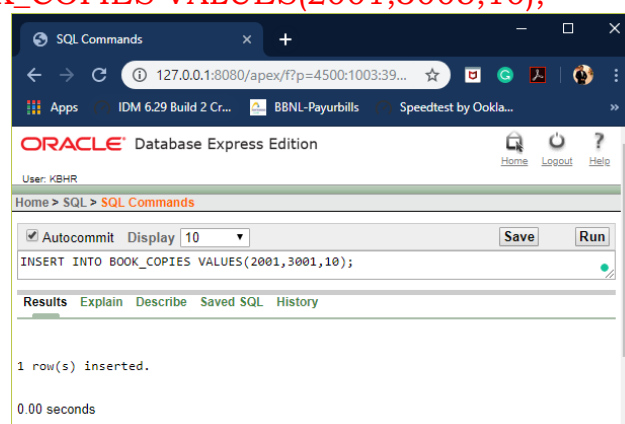
INSERT INTO BOOK_COPIES VALUES(2002,3001,10);

INSERT INTO BOOK_COPIES VALUES(2003,3001,10);

INSERT INTO BOOK_COPIES VALUES(2003,3002,10);

INSERT INTO BOOK_COPIES VALUES(2002,3002,10);

INSERT INTO BOOK_COPIES VALUES(2001,3005,10);



RETRIEVAL OF INSERTED VALUES

1. PUBLISHER:

SELECT * FROM PUBLISHER;

2. BOOK:

SELECT * FROM BOOK;

Oracle Database Express Edition interface showing the query results for 'SELECT * FROM PUBLISHER;'. The results table has columns: NAME, ADDRESS, and PHONE. There are 5 rows returned in 0.01 seconds.

NAME	ADDRESS	PHONE
PEARSON	NEW DELHI	9996621456
OXFORD	MUMBAI	9966884422
MC GRAW HILL	CHENNAI	8866333444
O_REILLY	MANGLORE	9999999999
APRESS & DREAMTECH	MAHARASTRA	9876549876

Oracle Database Express Edition interface showing the query results for 'SELECT * FROM BOOK;'. The results table has columns: BOOK_ID, TITLE, PUBLISHER_NAME, and PUB_YEAR. There are 5 rows returned in 0.00 seconds.

BOOK_ID	TITLE	PUBLISHER_NAME	PUB_YEAR
2001	DBMS	PEARSON	2015
2002	COMPUTER NETWORKS	OXFORD	2019
2003	JAVA	MC GRAW HILL	2016
2004	C PROGRAMMING	O_REILLY	2014
2005	PHP	APRESS & DREAMTECH	2017

3. BOOK_AUTHOR:

SELECT * FROM BOOK_AUTHOR;

4. LIBRARY_BRANCH

SELECT * FROM LIBRARY_BRANCH;

Oracle Database Express Edition interface showing the query results for 'SELECT * FROM BOOK_AUTHOR;'. The results table has columns: BOOK_ID and AUTHOR_NAME. There are 5 rows returned in 0.00 seconds.

BOOK_ID	AUTHOR_NAME
2001	KANISHKA BEDI
2002	POORNIMA M
2003	P C TRIPATHI
2004	P N REDDY
2005	VISHWA KIRAN

Oracle Database Express Edition interface showing the query results for 'SELECT * FROM LIBRARY_BRANCH;'. The results table has columns: BRANCH_ID, BRANCH_NAME, and ADDRESS. There are 5 rows returned in 0.00 seconds.

BRANCH_ID	BRANCH_NAME	ADDRESS
3001	R T NAGAR	BANGLORE
3002	MALESHWARAM	BANGLORE
3003	SECTOR 21	NODIA
3004	KLS INSTITUTE	BELGAUM
3005	YELAHANKA	BANGLORE

5. BOOK_LENDING:

SELECT * FROM BOOK_LENDING;

6. BOOK_COPIES:

SELECT * FROM BOOK_COPIES;

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL Commands window displays the query: `SELECT * FROM BOOK_LENDING;`. The query has been executed successfully, and the results are displayed in a table with 5 rows. The table has columns: BOOK_ID, BRANCH_ID, CARD_NO, DATE_OUT, and DUE_DATE. The results show 5 rows of data, with the first row being (2001, 3001, 4001, 02-JAN-17, 02-FEB-17). The status bar indicates that 5 rows were returned in 0.00 seconds.

BOOK_ID	BRANCH_ID	CARD_NO	DATE_OUT	DUE_DATE
2001	3001	4001	02-JAN-17	02-FEB-17
2002	3001	4001	07-JAN-17	07-FEB-17
2003	3001	4001	10-JAN-17	10-FEB-17
2004	3001	4001	20-JAN-17	20-FEB-17
2005	3002	4005	20-JAN-17	20-FEB-17

5 rows returned in 0.00 seconds [CSV Export](#)

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL Commands window displays the query: `SELECT * FROM BOOK_COPIES;`. The query has been executed successfully, and the results are displayed in a table with 6 rows. The table has columns: BOOK_ID, BRANCH_ID, and NO_OF_COPIES. The results show 6 rows of data, with the first row being (2001, 3001, 10). The status bar indicates that 6 rows were returned in 0.00 seconds.

BOOK_ID	BRANCH_ID	NO_OF_COPIES
2001	3001	10
2002	3001	10
2003	3001	10
2003	3002	10
2002	3002	10
2001	3005	10

6 rows returned in 0.00 seconds [CSV Export](#)

QUERIES

1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.

```
SELECT B.BOOK_ID, B.TITLE, B.PUBLISHER_NAME, A.AUTHOR_NAME,
C.NO_OF_COPIES, C.BRANCH_ID
FROM BOOK B, BOOK_AUTHOR A, BOOK_COPIES C
WHERE B.BOOK_ID=A.BOOK_ID AND B.BOOK_ID=C.BOOK_ID;
```

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window is active, displaying the following query:

```
SELECT B.BOOK_ID, B.TITLE, B.PUBLISHER_NAME, A.AUTHOR_NAME, C.NO_OF_COPIES, C.BRANCH_ID
FROM BOOK B, BOOK_AUTHOR A, BOOK_COPIES C
WHERE B.BOOK_ID=A.BOOK_ID AND B.BOOK_ID=C.BOOK_ID;
```

The query has been executed, and the results are displayed in a table with 6 rows and 6 columns. The columns are: BOOK_ID, TITLE, PUBLISHER_NAME, AUTHOR_NAME, NO_OF_COPIES, and BRANCH_ID. The results are as follows:

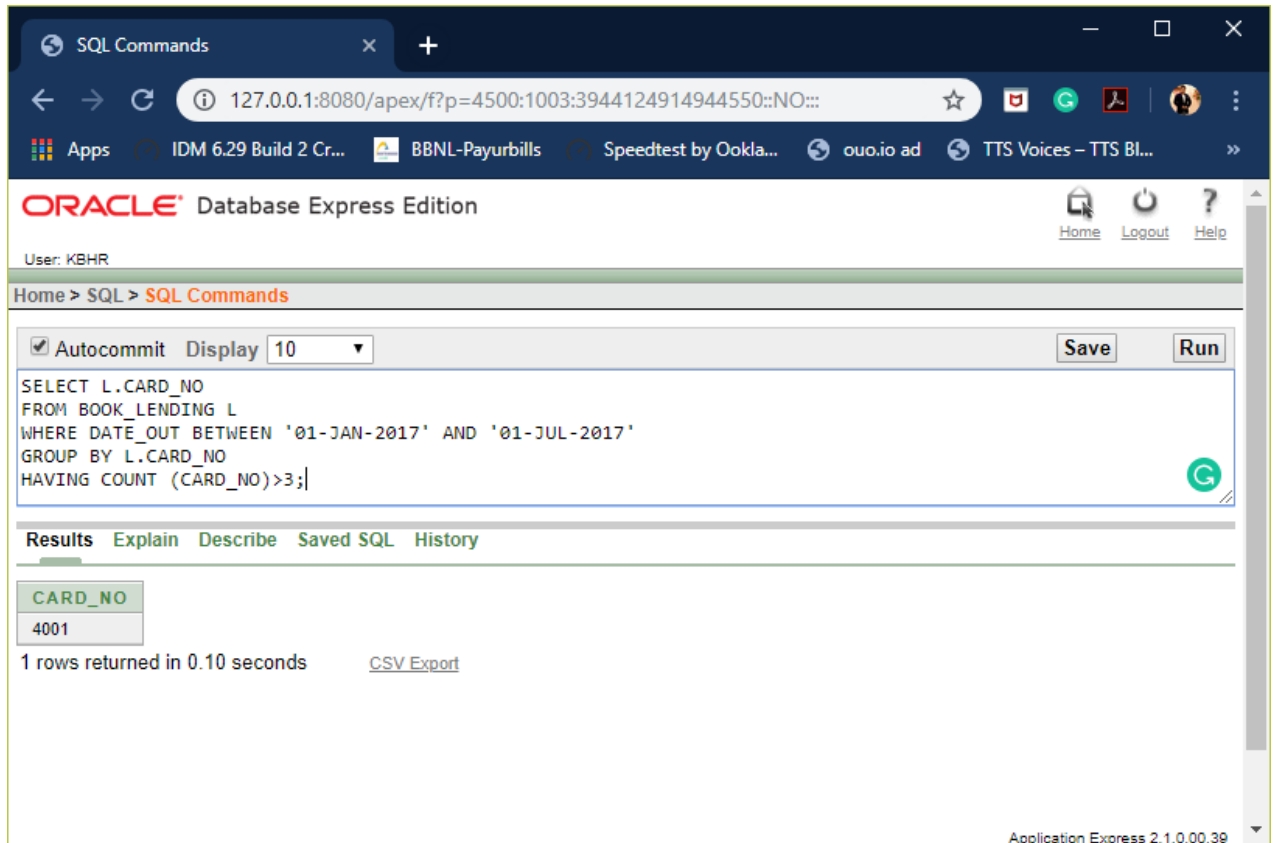
BOOK_ID	TITLE	PUBLISHER_NAME	AUTHOR_NAME	NO_OF_COPIES	BRANCH_ID
2001	DBMS	PEARSON	KANISHKA BEDI	10	3001
2002	COMPUTER NETWORKS	OXFORD	POORNIMA M	10	3001
2003	JAVA	MC GRAW HILL	P C TRIPATHI	10	3001
2003	JAVA	MC GRAW HILL	P C TRIPATHI	10	3002
2002	COMPUTER NETWORKS	OXFORD	POORNIMA M	10	3002
2001	DBMS	PEARSON	KANISHKA BEDI	10	3005

6 rows returned in 0.07 seconds [CSV Export](#)

Application Express 2.1.0.00.39

2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.

```
SELECT L.CARD_NO  
FROM BOOK_LENDING L  
WHERE DATE_OUT BETWEEN '01-JAN-2017' AND '01-JUL-2017'  
GROUP BY L.CARD_NO  
HAVING COUNT (CARD_NO)>3;
```



The screenshot shows the Oracle Database Express Edition interface. The browser address bar indicates the URL `127.0.0.1:8080/apex/f?p=4500:1003:3944124914944550::NO::`. The page title is "ORACLE Database Express Edition". The user is logged in as "User: KBHR". The "SQL Commands" tab is active, showing the following SQL query:

```
SELECT L.CARD_NO  
FROM BOOK_LENDING L  
WHERE DATE_OUT BETWEEN '01-JAN-2017' AND '01-JUL-2017'  
GROUP BY L.CARD_NO  
HAVING COUNT (CARD_NO)>3;
```

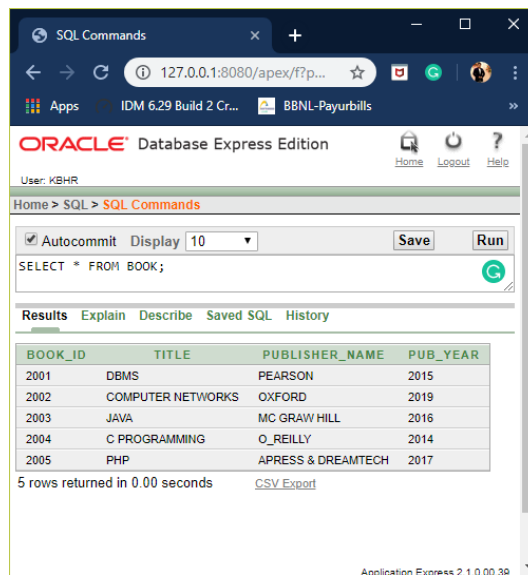
The query has been executed, and the results are displayed in a table with the following data:

CARD_NO
4001

Below the table, it states "1 rows returned in 0.10 seconds" and provides a link for "CSV Export". The bottom right corner of the application shows the version "Application Express 2.1.0.00.39".

3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.

SELECT * FROM BOOK;

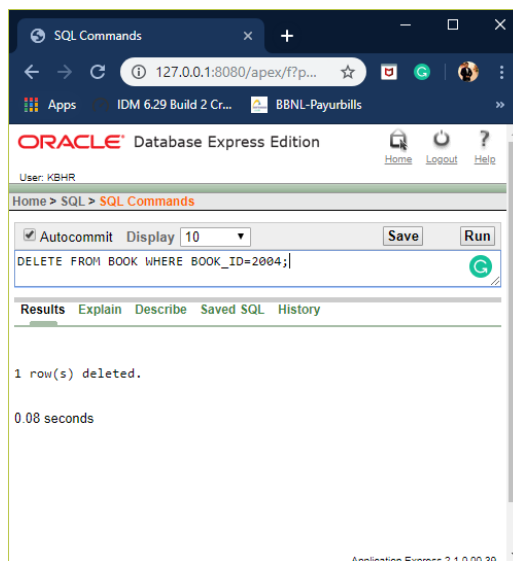


The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the query `SELECT * FROM BOOK;`. The results are displayed in a table with 5 rows.

BOOK_ID	TITLE	PUBLISHER_NAME	PUB_YEAR
2001	DBMS	PEARSON	2015
2002	COMPUTER NETWORKS	OXFORD	2019
2003	JAVA	MC GRAW HILL	2016
2004	C PROGRAMMING	O_REILLY	2014
2005	PHP	APRESS & DREAMTECH	2017

5 rows returned in 0.00 seconds

DELETE FROM BOOK WHERE BOOK_ID=2004;

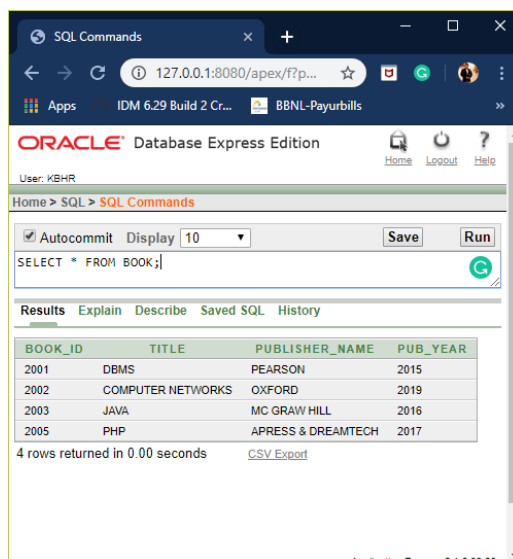


The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the query `DELETE FROM BOOK WHERE BOOK_ID=2004;`. The results show that 1 row was deleted.

1 row(s) deleted.

0.08 seconds

SELECT * FROM BOOK;



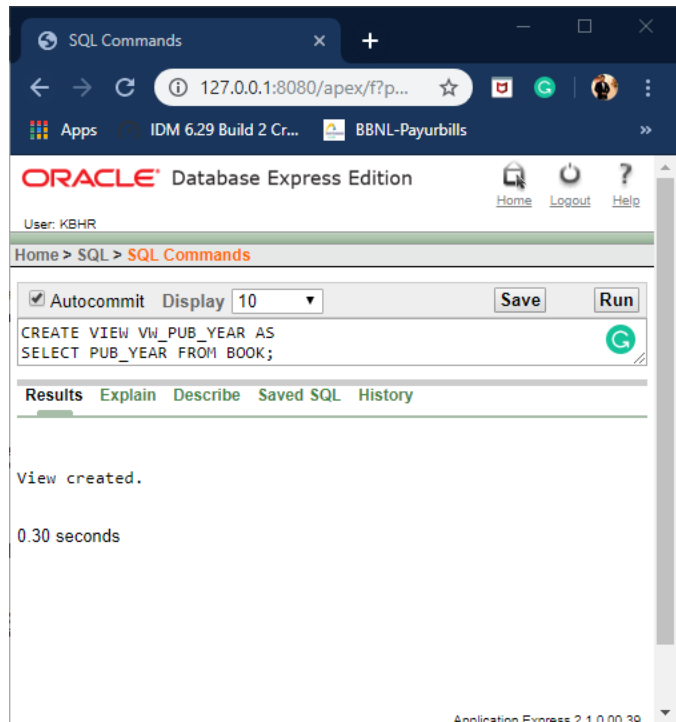
The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the query `SELECT * FROM BOOK;`. The results are displayed in a table with 4 rows, as the book with ID 2004 has been deleted.

BOOK_ID	TITLE	PUBLISHER_NAME	PUB_YEAR
2001	DBMS	PEARSON	2015
2002	COMPUTER NETWORKS	OXFORD	2019
2003	JAVA	MC GRAW HILL	2016
2005	PHP	APRESS & DREAMTECH	2017

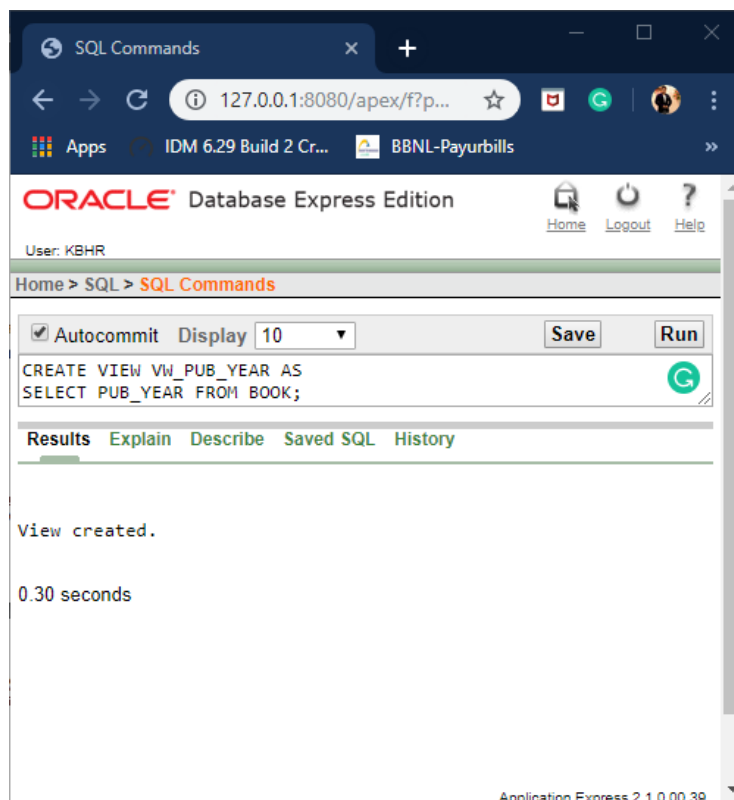
4 rows returned in 0.00 seconds

4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.

CREATE VIEW VW_PUB_YEAR AS
SELECT PUB_YEAR FROM BOOK;

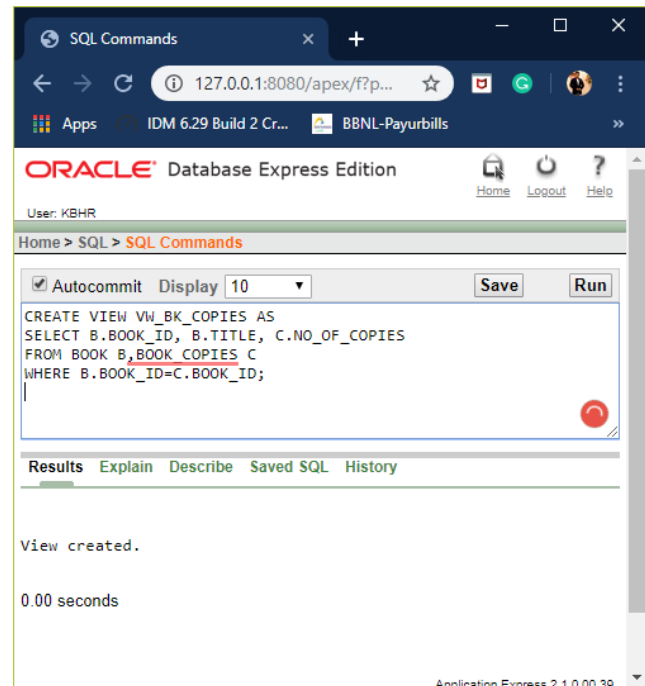


SELECT * FROM VW_PUB_YEAR;

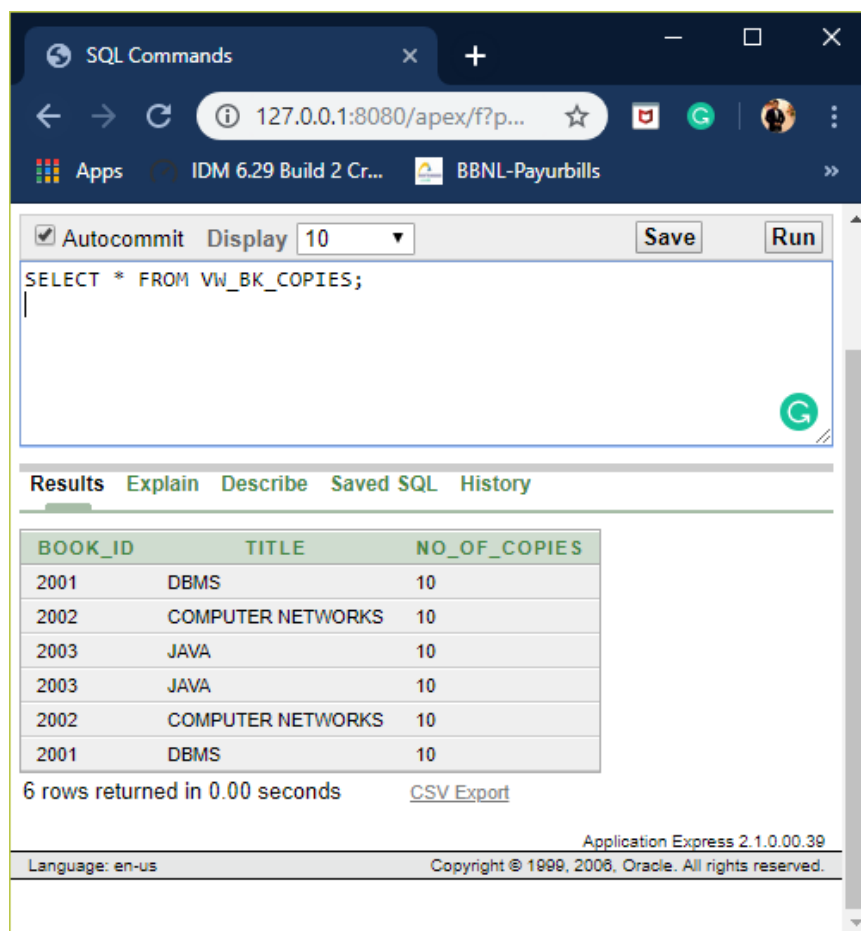


5. Create a view of all books and its number of copies that are currently available in the Library.

```
CREATE VIEW VW_BK_COPIES AS
SELECT B.BOOK_ID, B.TITLE,
       C.NO_OF_COPIES
FROM BOOK B, BOOK_COPIES C
WHERE B.BOOK_ID=C.BOOK_ID;
```



```
SELECT * FROM VW_BK_COPIES;
```



THE END