Assignment-2

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1. The following table contains all the integrity constraints for each table definition in the university schema.

Table	Primary Key	Domain of PK	Foreign Key	Not NULL
classroom	building, room_number	varchar	None	building, room_number
department	dept_name	varchar	None	dept_name
course	course_id	varchar	dept_name (*refernces department*)	course_id, credits
instructor	ID	varchar	dept_name (*refernces department*)	ID, name
section	course_id, sec_id, semester, year,	varchar, numeric	dept_name (*refernces department*), building , room_number (*references classrom*)	course_id, sec_id, semester, year, credits
teaches	ID, course_id, sec_id, semester, year	varchar, numeric	course_id, sec_id, semester, year, (*refernces section*), ID (*references instructor*)	ID, course_id, sec_id, semester, year
student	ID	varchar	Dept_name (*refernces department*)	ID, name
takes	ID, course_id, sec_id, semester, year	varchar, numeric	course_id, sec_id, semester, year (*references section*), ID (*references student*)	ID, course_id, sec_id, semester, year
advisor	s_ID	varchar	i_ID (*references*	s_ID

			instructor (ID)), s_ID (*references student (ID)*)	
time_slot	time_slot_id, day, start_hr, start_min	varchar, numeric	None	time_slot_id, day, start_hr, start_min
prereq	course_id, prereq_id	varchar	course_id (*references course*), prereq_id (*references course*)	course_id, prereq_id

2. Query used:

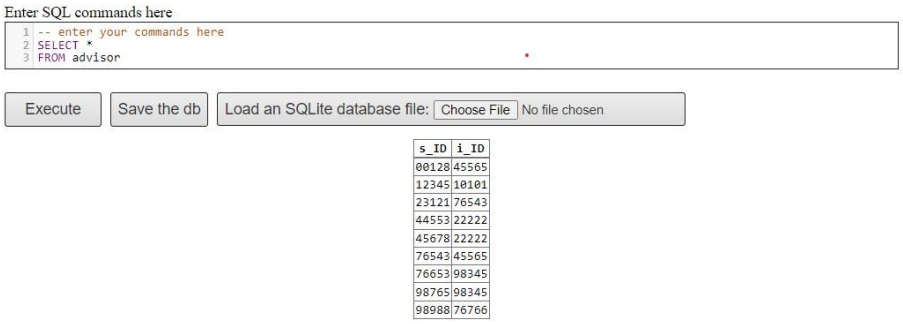
SELECT *
FROM student s, department d, takes t, advisor a, instructor i
WHERE s.name = 'Brown' **and** s.id = t.id **and** s.id = a.s_id **and** a.i_ID = i.id **and** s.dept_name = d.dept_name;

Output:

ID	name	dept_name	tot_cred	dept_name	building	budget	ID	course_id	sec_id	semester	year	grade	s_ID	i_ID	ID	name	dept_name	salary
76543	Brown	Comp. Sci.	58	Comp. Sci.	Taylor	100000	76543	CS-101	1	Fall	2017	A	76543	45565	45565	Katz	Comp. Sci.	75000
76543	Brown	Comp. Sci.	58	Comp. Sci.	Taylor	100000	76543	CS-319	2	Spring	2018	A	76543	45565	45565	Katz	Comp. Sci.	75000

3. The following answer contains 2 images for each table 1st before running the query and 2nd the output after running the query.

a. Advisor



s_ID	i_ID
00128	45565
12345	10101
23121	76543
44553	22222
45678	22222
76543	45565
76653	98345
98765	98345
98988	76766

Figure 1 Advisor Table

Query:

SELECT s_id

FROM advisor

WHERE s_id%2 == 0

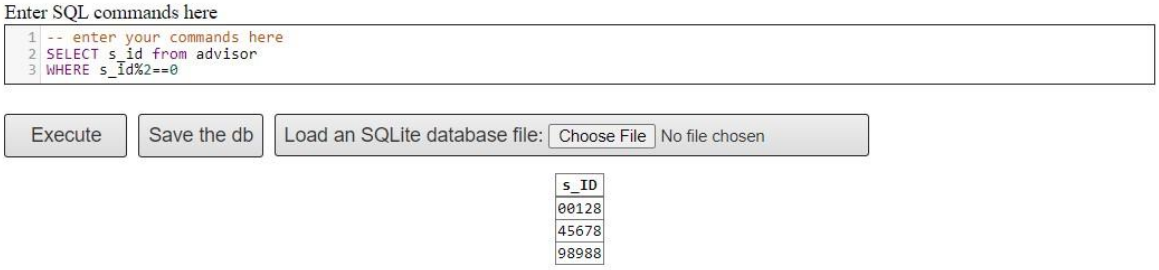


Figure 2 Output after running above query on Advisor

b. classroom

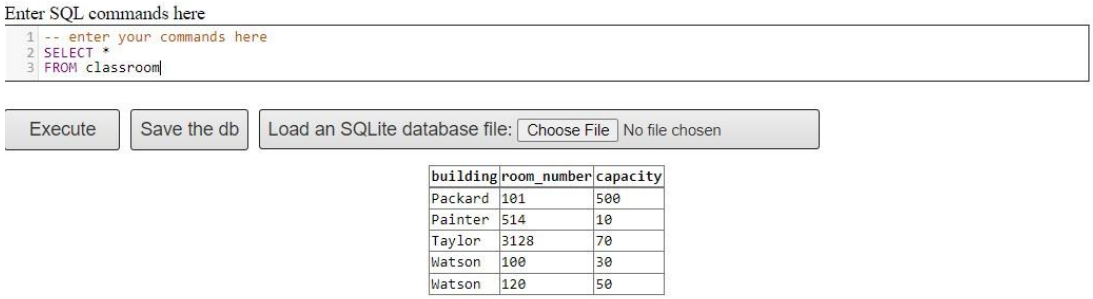


Figure 3 classroom table

Query:

INSERT INTO classroom

VALUES ('IIT', 2000, 150);

SELECT * **FROM** classroom

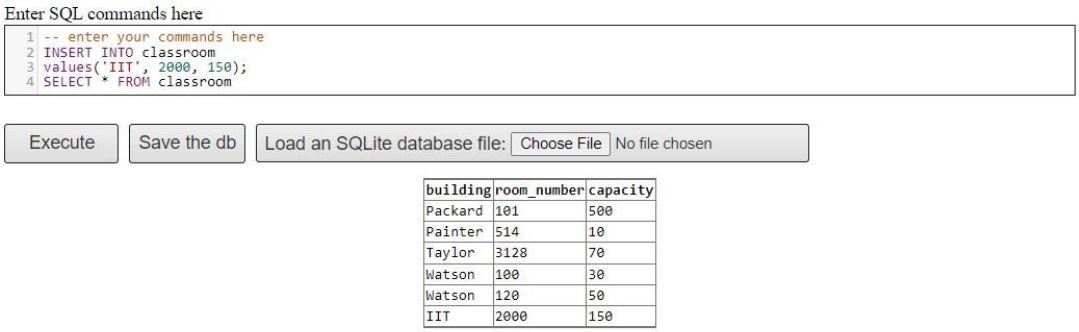


Figure 4 Output after running the above query

c. course

Enter SQL commands here

```
-- enter your commands here
SELECT *
FROM course
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

course_id	title	dept_name	credits
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

Figure 5 course table

Query:

UPDATE course
SET TITLE = Biology For Engineers', credits = 6
WHERE course_id = 'BIO-101';
SELECT * **FROM** course

Enter SQL commands here

```
UPDATE course
SET TITLE = 'Biology For Engineers', credits = 6
WHERE course_id = 'BIO-101';
SELECT * FROM course
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

course_id	title	dept_name	credits
BIO-101	Biology For Engineers	Biology	6
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

Figure 6 Output after running above Query

d. department

Enter SQL commands here

```
-- enter your commands here
SELECT *
FROM department
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

dept_name	building	budget
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

Figure 7 department table

Query:

DROP TABLE department

Enter SQL commands here

```
-- enter your commands here
DROP TABLE department
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

Figure 8 Output after running above query

e. instructor

Enter SQL commands here

```
-- enter your commands here
SELECT *
FROM instructor
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	name	dept_name	salary
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

Figure 9 instructor table

Query:

DELETE FROM instructor

WHERE salary=65000;

SELECT * **FROM** instructor

Enter SQL commands here

```
DELETE FROM instructor
WHERE salary=65000;
SELECT * FROM instructor
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	name	dept_name	salary
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

Figure 10 Output after running above query

f. prereq

Enter SQL commands here

```
-- enter your commands here
SELECT * from prereq
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

course_id	prereq_id
BIO-301	BIO-101
BIO-399	BIO-101
CS-190	CS-101
CS-315	CS-101
CS-319	CS-101
CS-347	CS-101
EE-181	PHY-101

Figure 11 prereq table

Query:

SELECT course_id

FROM prereq

WHERE prereq_id **LIKE** 'C%'

Enter SQL commands here

```
-- enter your commands
SELECT course_id
FROM prereq
WHERE prereq_id LIKE 'C%'
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

course_id
CS-190
CS-315
CS-319
CS-347

Figure 12 output after running above query

g. section

Enter SQL commands here

```
-- enter your commands here
SELECT * FROM section
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

course_id	sec_id	semester	year	building	room_number	time_slot_id
BIO-101	1	Summer	2017	Painter	514	B
BIO-301	1	Summer	2018	Painter	514	A
CS-101	1	Fall	2017	Packard	101	H
CS-101	1	Spring	2018	Packard	101	F
CS-190	1	Spring	2017	Taylor	3128	E
CS-190	2	Spring	2017	Taylor	3128	A
CS-315	1	Spring	2018	Watson	120	D
CS-319	1	Spring	2018	Watson	100	B
CS-319	2	Spring	2018	Taylor	3128	C
CS-347	1	Fall	2017	Taylor	3128	A
EE-181	1	Spring	2017	Taylor	3128	C
FIN-201	1	Spring	2018	Packard	101	B
HIS-351	1	Spring	2018	Painter	514	C
MU-199	1	Spring	2018	Packard	101	D
PHY-101	1	Fall	2017	Watson	100	A

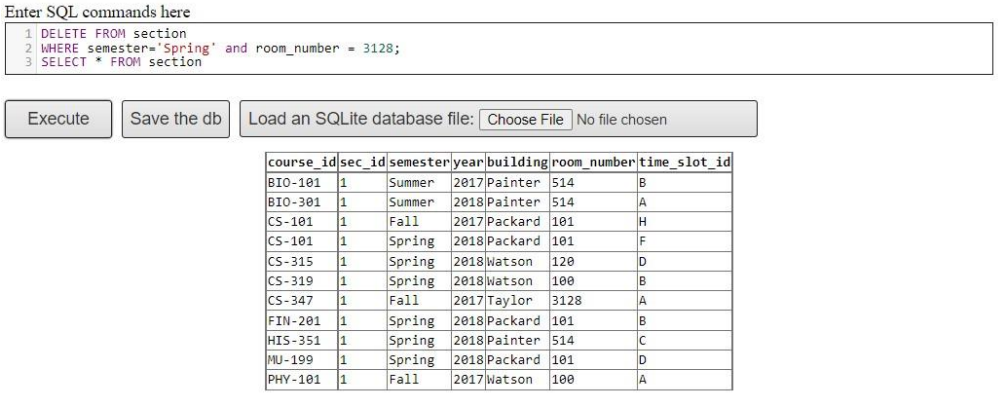
Figure 13 section table

Query:

DELETE FROM section

WHERE semester = 'Spring' **and** room_number = 3128;

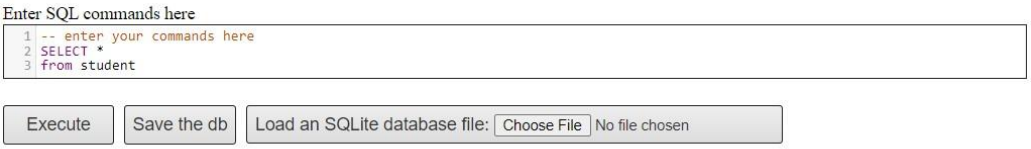
SELECT * **FROM** section



course_id	sec_id	semester	year	building	room_number	time_slot_id
BIO-101	1	Summer	2017	Painter	514	B
BIO-301	1	Summer	2018	Painter	514	A
CS-101	1	Fall	2017	Packard	101	H
CS-101	1	Spring	2018	Packard	101	F
CS-315	1	Spring	2018	Watson	120	D
CS-319	1	Spring	2018	Watson	100	B
CS-347	1	Fall	2017	Taylor	3128	A
FIN-201	1	Spring	2018	Packard	101	B
HIS-351	1	Spring	2018	Painter	514	C
MU-199	1	Spring	2018	Packard	101	D
PHY-101	1	Fall	2017	Watson	100	A

Figure 14 output after running above query

h. student



ID	name	dept_name	tot_cred
00128	Zhang	Comp. Sci.	102
12345	Shankar	Comp. Sci.	32
19991	Brandt	History	80
23121	Chavez	Finance	110
44553	Peltier	Physics	56
45678	Levy	Physics	46
54321	Williams	Comp. Sci.	54
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
98988	Tanaka	Biology	120

Figure 15 student table

Query:

SELECT *

FROM student **ORDER BY** name

Enter SQL commands here

```
-- enter your commands here
SELECT *
from student ORDER BY name
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	name	dept_name	tot_cred
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
19991	Brandt	History	80
76543	Brown	Comp. Sci.	58
23121	Chavez	Finance	110
45678	Levy	Physics	46
44553	Peltier	Physics	56
55739	Sanchez	Music	38
12345	Shankar	Comp. Sci.	32
70557	Snow	Physics	0
98988	Tanaka	Biology	120
54321	Williams	Comp. Sci.	54
00128	Zhang	Comp. Sci.	102

Figure 16 result after running above query

i. takes

Enter SQL commands here

```
-- enter your commands here
SELECT *
FROM takes
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	course_id	sec_id	semester	year	grade
00128	CS-101	1	Fall	2017	A
00128	CS-347	1	Fall	2017	A-
12345	CS-101	1	Fall	2017	C
12345	CS-190	2	Spring	2017	A
12345	CS-315	1	Spring	2018	A
12345	CS-347	1	Fall	2017	A
19991	HIS-351	1	Spring	2018	B
23121	FIN-201	1	Spring	2018	C+
44553	PHY-101	1	Fall	2017	B-
45678	CS-101	1	Fall	2017	F
45678	CS-101	1	Spring	2018	B+
45678	CS-319	1	Spring	2018	B
54321	CS-101	1	Fall	2017	A-
54321	CS-190	2	Spring	2017	B+
55739	MU-199	1	Spring	2018	A-
76543	CS-101	1	Fall	2017	A
76543	CS-319	2	Spring	2018	A
76653	EE-181	1	Spring	2017	C
98765	CS-101	1	Fall	2017	C-
98765	CS-315	1	Spring	2018	B
98988	BIO-101	1	Summer	2017	A
98988	BIO-301	1	Summer	2018	

Figure 17 takes

Query:

ALTER TABLE takes

ADD Result varchar(50);

SELECT * **FROM** takes

Enter SQL commands here

```
-- enter your commands here
ALTER TABLE takes
ADD Result varchar(50);
SELECT * FROM takes
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	course_id	sec_id	semester	year	grade	Result
00128	CS-101	1	Fall	2017	A	
00128	CS-347	1	Fall	2017	A-	
12345	CS-101	1	Fall	2017	C	
12345	CS-190	2	Spring	2017	A	
12345	CS-315	1	Spring	2018	A	
12345	CS-347	1	Fall	2017	A	
19991	HIS-351	1	Spring	2018	B	
23121	FIN-201	1	Spring	2018	C+	
44553	PHY-101	1	Fall	2017	B-	
45678	CS-101	1	Fall	2017	F	
45678	CS-101	1	Spring	2018	B+	
45678	CS-319	1	Spring	2018	B	
54321	CS-101	1	Fall	2017	A-	
54321	CS-190	2	Spring	2017	B+	
55739	MU-199	1	Spring	2018	A-	
76543	CS-101	1	Fall	2017	A	
76543	CS-319	2	Spring	2018	A	
76653	EE-181	1	Spring	2017	C	
98765	CS-101	1	Fall	2017	C-	
98765	CS-315	1	Spring	2018	B	

Figure 18 output after running above query

j. teaches

Enter SQL commands here

```
-- enter your commands here
SELECT *
FROM teaches
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	course_id	sec_id	semester	year
10101	CS-101	1	Fall	2017
10101	CS-315	1	Spring	2018
10101	CS-347	1	Fall	2017
12121	FIN-201	1	Spring	2018
15151	MU-199	1	Spring	2018
22222	PHY-101	1	Fall	2017
32343	HIS-351	1	Spring	2018
45565	CS-101	1	Spring	2018
45565	CS-319	1	Spring	2018
76766	BIO-101	1	Summer	2017
76766	BIO-301	1	Summer	2018
83821	CS-190	1	Spring	2017
83821	CS-190	2	Spring	2017
83821	CS-319	2	Spring	2018
98345	EE-181	1	Spring	2017

Figure 19 teaches table

Query:

SELECT * **FROM** teaches **ORDER BY** year;

Enter SQL commands here

```
-- enter your commands here
SELECT * FROM teaches ORDER BY year;
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

ID	course_id	sec_id	semester	year
10101	CS-101	1	Fall	2017
10101	CS-347	1	Fall	2017
22222	PHY-101	1	Fall	2017
76766	BIO-101	1	Summer	2017
83821	CS-190	1	Spring	2017
83821	CS-190	2	Spring	2017
98345	EE-181	1	Spring	2017
10101	CS-315	1	Spring	2018
12121	FIN-201	1	Spring	2018
15151	MU-199	1	Spring	2018
32343	HIS-351	1	Spring	2018
45565	CS-101	1	Spring	2018
45565	CS-319	1	Spring	2018
76766	BIO-301	1	Summer	2018
83821	CS-319	2	Spring	2018

Figure 20 output after running above query

k. time_slot

Enter SQL commands here

```
-- enter your commands here
SELECT * FROm time_slot
```

Execute | Save the db | Load an SQLite database file: Choose File No file chosen

time_slot_id	day	start_hr	start_min	end_hr	end_min
A	M	8	0	8	50
A	W	8	0	8	50
A	F	8	0	8	50
B	M	9	0	9	50
B	W	9	0	9	50
B	F	9	0	9	50
C	M	11	0	11	50
C	W	11	0	11	50
C	F	11	0	11	50
D	M	13	0	13	50
D	W	13	0	13	50
D	F	13	0	13	50
E	T	10	30	11	45
E	R	10	30	11	45
F	T	14	30	15	45
F	R	14	30	15	45
G	M	16	0	16	50
G	W	16	0	16	50
G	F	16	0	16	50
H	W	10	0	12	30

Figure 21 time_slot table

Query:

SELECT time_slot_id, day

FROM time_slot

WHERE start_min = 0 **and** end_hr<10

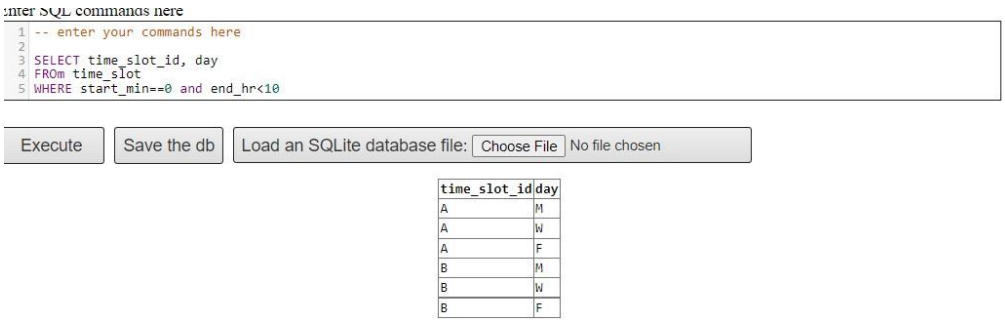


Figure 22 output after running above query

4. a)

In these question I have taken xxx = 'Music' and yyy = 'Packard'

Query:

SELECT DISTINCT student.ID, student.name
FROM student, department, section
WHERE department.dept_name = 'Music' **and** department.building = 'Packard' **and** student.dept_name = department.dept_name and section.building = department.building

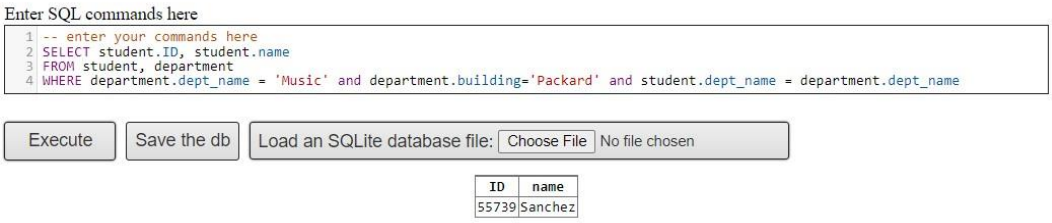


Figure 23 Output

b)

Query:

SELECT student.ID, student.name

FROM takes, student

WHERE grade = 'A' **and** student.id = takes.id

INTERSECT

SELECT student.ID, student.name

FROM takes, student

WHERE grade = 'C' **and** student.id = takes.id

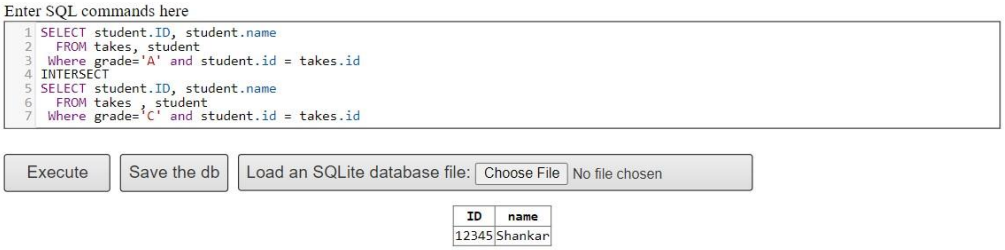


Figure 24 output

c)

Query:

SELECT DISTINCT classroom.building, classroom.room_number

FROM section, classroom, time_slot

WHERE classroom.building = section.building **and** classroom.room_number = section.room_number **and** section.time_slot_id = time_slot.time_slot_id **and** day = 'W'

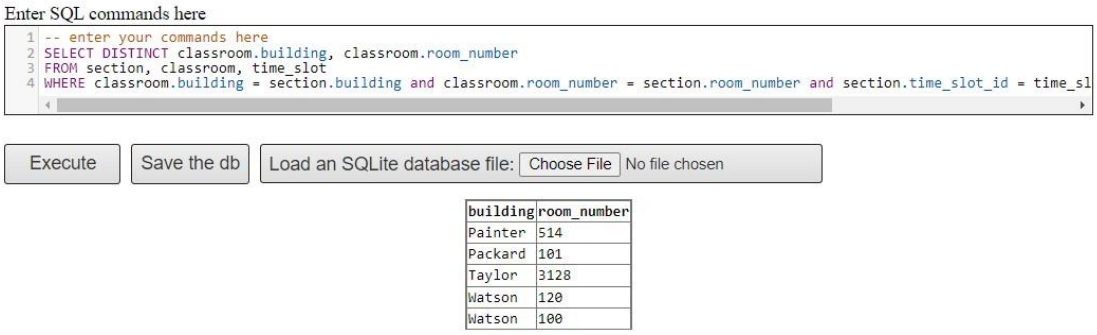


Figure 25 output