

# CS313: Lab Assignment 2

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## 1 Answer to Question 1: Integrity Constraint Tabulation

The below table contains all integrity constraints of the tables within the university schema at <https://www.db-book.com/university-lab-dir/sqljs.html>. Note that `VARCHAR(n)` refers to a variable-length *character* string that has a maximum length of n. `NUMERIC(n,m)` refers to a *fixed point number* with user-specified precision of n digits, with m digits to the right of decimal point.

Table	Primary Key (PK)	Domain of PK	Foreign Key (Referencing Table)	Not Null
classroom	building	VARCHAR(15)	-	-
	room_number	VARCHAR(7)		
department	dept_name	VARCHAR(20)	-	-
course	course_id	VARCHAR(8)	(dept_name) references department	-
section	course_id	VARCHAR(8)	(course_id) references course, (building, room_number) references classroom	-
	sec_id	VARCHAR(8)		
	semester	VARCHAR(6)		
	year	NUMERIC(4,0)		
instructor	ID	VARCHAR(5)	(dept_name) references department	name
teaches	ID	VARCHAR(5)	(course_id, sec_id, semester, year) references section, (ID) references instructor	-
	course_id	VARCHAR(8)		
	sec_id	VARCHAR(8)		
	semester	VARCHAR(6)		
	year	NUMERIC(4,0)		
student	ID	VARCHAR(5)	(dept_name) references department	name
takes	ID	VARCHAR(5)	(course_id, sec_id, semester, year) references section, (ID) references student	-
	course_id	VARCHAR(8)		
	sec_id	VARCHAR(8)		
	semester	VARCHAR(6)		
	year	NUMERIC(4,0)		
advisor	s_ID	VARCHAR(5)	(i_ID) references instructor (ID), (s_ID) references student (ID)	-
time_slot	time_slot_id	VARCHAR(4)	-	-
	day	VARCHAR(1)		
	start_hr	NUMERIC(2)		
	start_min	NUMERIC(2)		
prereq	course_req	VARCHAR(8)	(course_id) references course, (prereq_id) references course	-
	prereq_id	VARCHAR(8)		

Table 1: Integrity Constraints in university schema

## 2 Answers to Question 2: Getting all data of a particular student

Let us consider all data of the student named 'Shankar'. We can use natural joins to reduce column redundancy, OR we could use joins (manually) which may result in some redundancy. Either way, we get all the data we want corresponding to the student in question.

The queries used for retrieval of this info, accompanied by the respective output tables are as follows:

Using Natural Joins:

```
SELECT * FROM(
  SELECT * FROM(
    SELECT * FROM(
      (student NATURAL JOIN department) NATURAL JOIN takes
    ) WHERE student.name = 'Shankar'
  ) AS A, advisor WHERE A.ID = advisor.s_id
) AS B, instructor WHERE B.i_ID = instructor.ID;
```

ID	name	dept_name	tot_cred	building	budget	course_id	sec_id	semester	year	grade	s_ID	i_ID	ID	name	dept_name	salary
12345	Shankar	Comp. Sci.	32	Taylor	100000	CS-101	1	Fall	2017	C	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Taylor	100000	CS-190	2	Spring	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Taylor	100000	CS-315	1	Spring	2018	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Taylor	100000	CS-347	1	Fall	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000

Using Joins:

(This is how the example given in the assignment worksheet appears to have been done)

```
SELECT * FROM(
  SELECT * FROM(
    SELECT * FROM(
      SELECT * FROM(
        SELECT * FROM student WHERE student.name = 'Shankar'
      ) AS R1, department WHERE R1.dept_name = department.dept_name
    ) AS R2, takes WHERE R2.ID = takes.ID
  ) AS R3, advisor WHERE R3.ID = advisor.s_ID
) AS R4, instructor WHERE R4.i_id = instructor.ID;
```

ID	name	dept_name	tot_cred	dept_name:1	building	budget	ID:1	course_id	sec_id	semester	year	grade	s_ID	i_ID	ID	name	dept_name	salary
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-101	1	Fall	2017	C	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-190	2	Spring	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-315	1	Spring	2018	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000
12345	Shankar	Comp. Sci.	32	Comp. Sci.	Taylor	100000	12345	CS-347	1	Fall	2017	A	12345	10101	10101	Srinivasan	Comp. Sci.	65000

What we can infer from the above tables is: A student named 'Shankar' with ID = 12345 is in the Comp. Sci. department, and he has a total of 32 credits. His department is located in the 'Taylor' building and has a budget of 100000. He has taken 4 courses, CS-101, CS-190, CS-315 and CS-347. The semester/year, sec.id and grades for the same can be observed above. His advisor is an instructor named 'Srinivasan' with ID = 10101, who works in the Comp. Sci. department, and earns a salary of 65000.

### 3 Answers to Question 3: SQL SELECT and INSERT

Here, we will explore the SQL commands SELECT and INSERT to construct and manipulate the tables of the the university schema. Firstly, we will insert records into the tables and observe the updations.

```
-- INSERTION INTO ALL THE TABLES

SELECT * FROM classroom;
INSERT INTO classroom VALUES('Swift', '2002', 54);
SELECT * FROM classroom;

SELECT * FROM department;
INSERT INTO department VALUES('Biotechnology', 'Swift', 1000000);
SELECT * FROM department;

SELECT * FROM course;
INSERT INTO course VALUES('BT-605', 'Biomedical Imaging', 'Biotechnology', 6);
SELECT * FROM course;

SELECT * FROM instructor;
INSERT INTO instructor VALUES('10034', 'Nirmit', 'Biotechnology', 125000);
SELECT * FROM instructor;

SELECT * FROM time_slot;
INSERT INTO time_slot VALUES('E', 'M', 15, 0, 16, 20);
SELECT * FROM time_slot;

SELECT * FROM section;
INSERT INTO section VALUES('BT-605', '2', 'Fall', 2022, 'Swift', '2002', 'E');
SELECT * FROM section;

SELECT * FROM teaches;
INSERT INTO teaches VALUES('10034', 'BT-605', '2', 'Fall', 2022);
SELECT * FROM teaches;

SELECT * FROM student;
INSERT INTO student VALUES('17685', 'Rohan', 'Biotechnology', 150);
SELECT * FROM student;

SELECT * FROM takes;
INSERT INTO takes VALUES('17685', 'BT-605', '2', 'Fall', 2022, 'A+');
INSERT INTO takes VALUES('17685', 'BIO-101', '1', 'Summer', 2018, 'A+');
INSERT INTO takes VALUES('17685', 'CS-101', '1', 'Fall', 2017, 'A');
INSERT INTO takes VALUES('17685', 'PHY-101', '1', 'Fall', 2017, 'B');
INSERT INTO takes VALUES('17685', 'CS-315', '1', 'Spring', 2018, 'B+');
SELECT * FROM takes;
```

```

SELECT * FROM advisor;
INSERT INTO advisor VALUES('17685', '10034');
SELECT * FROM advisor;

SELECT * FROM prereq;
INSERT INTO prereq VALUES('BT-605', 'CS-101');
INSERT INTO prereq VALUES('BT-605', 'BIO-101');
SELECT * FROM prereq;

```

Below are images of the insertions in 'classroom' and 'department':

building	room_number	capacity
Packard	101	500
Painter	514	10
Taylor	3128	70
Watson	100	30
Watson	120	50

building	room_number	capacity
Packard	101	500
Painter	514	10
Taylor	3128	70
Watson	100	30
Watson	120	50
Swift	2002	54

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

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
Biotechnology	Swift	1000000

Below are images of the insertions in ‘course’:

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

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
BT-605	Biomedical Imaging	Biotechnology	6

Below are images of the insertions in ‘instructor’:

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

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
10034	Nirmit	Biotechnology	125000



Below are images of the insertions in ‘time\_slot’:

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

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
E	M	15	0	16	20

Below are images of the insertions in ‘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-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

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
BT-605	2	Fall	2022	Swift	2002	E

Below are images of the insertions in ‘teaches’:

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

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
10034	BT-605	2	Fall	2022

Below are images of the insertions in ‘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

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
17685	Rohan	Biotechnology	150

Below are images of the insertions in 'takes':

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	

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	
17685	BT-605	2	Fall	2022	A+
17685	BIO-101	1	Summer	2018	A+
17685	CS-101	1	Fall	2017	A
17685	PHY-101	1	Fall	2017	B
17685	CS-315	1	Spring	2018	B+



Below are images of the insertions in 'advisor':

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

s_ID	i_ID
00128	45565
12345	10101
23121	76543
44553	22222
45678	22222
76543	45565
76653	98345
98765	98345
98988	76766
17685	10034

Below are images of the insertions in 'prereq':

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

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
BT-605	CS-101
BT-605	BIO-101

Now, let us explore more with the SELECT command, using different clauses, queries, and subqueries.

```

-- The comments below describe the concepts (related to SELECT) illustrated by the
→ corresponding queries!

-- Basic stuff; SELECT, NATURAL JOIN, Logical operators, ORDER BY
SELECT *
FROM (student NATURAL JOIN department)
WHERE (building = 'Taylor' AND tot_cred >= 50) OR building = 'Watson'
ORDER BY ID DESC;

-- Aggregate functions, Nested subqueries, (ORDER BY doesn't matter here)
SELECT COUNT(*), MAX(tot_cred), MIN(tot_cred), AVG(tot_cred), SUM(tot_cred)
FROM(
    SELECT *
    FROM (student NATURAL JOIN department)
    WHERE (building = 'Taylor' AND (tot_cred BETWEEN 50 AND 110))
    OR building = 'Watson'
    -- ORDER BY ID DESC
);

-- DISTINCT
SELECT DISTINCT i_id
FROM advisor;

-- String operations
SELECT *
FROM (student NATURAL JOIN takes)
WHERE (name LIKE '%s%') AND (name NOT LIKE '_h%');

-- GROUP BY, HAVING
SELECT dept_name, AVG(tot_cred)
FROM student
GROUP BY dept_name
HAVING AVG(tot_cred) > 82;

```

The output of the above queries is as follows:

ID	name	dept_name	tot_cred	building	budget
98988	Tanaka	Biology	120	Watson	90000
98765	Bourikas	Elec. Eng.	98	Taylor	85000
76653	Aoi	Elec. Eng.	60	Taylor	85000
76543	Brown	Comp. Sci.	58	Taylor	100000
70557	Snow	Physics	0	Watson	70000
54321	Williams	Comp. Sci.	54	Taylor	100000
45678	Levy	Physics	46	Watson	70000
44553	Peltier	Physics	56	Watson	70000
00128	Zhang	Comp. Sci.	102	Taylor	100000

COUNT(*)	MAX(tot_cred)	MIN(tot_cred)	AVG(tot_cred)	SUM(tot_cred)
9	120	0	66	594

advisor_id
45565
10101
76543
22222
98345
76766

ID	name	dept_name	tot_cred	course_id	sec_id	semester	year	grade
54321	Williams	Comp. Sci.	54	CS-101	1	Fall	2017	A-
54321	Williams	Comp. Sci.	54	CS-190	2	Spring	2017	B+
55739	Sanchez	Music	38	MU-199	1	Spring	2018	A-
98765	Bourikas	Elec. Eng.	98	CS-101	1	Fall	2017	C-
98765	Bourikas	Elec. Eng.	98	CS-315	1	Spring	2018	B

dept_name	AVG(tot_cred)
Biology	120
Finance	110

course_id	title	dept_name	credits	prereq_id
BIO-301	Genetics	Biology	4	BIO-101
BIO-399	Computational Biology	Biology	3	BIO-101
CS-190	Game Design	Comp. Sci.	4	CS-101
CS-315	Robotics	Comp. Sci.	3	CS-101
CS-319	Image Processing	Comp. Sci.	3	CS-101
CS-347	Database System Concepts	Comp. Sci.	3	CS-101
EE-181	Intro. to Digital Systems	Elec. Eng.	3	PHY-101

## 4 Answers to Question 4: More Queries!

### 4.1 (a) Which students study in x department and y building?

Let x be 'Physics' department and y be 'Watson' building. Then, the code would entail the following query:

```
SELECT DISTINCT ID, name
FROM (student NATURAL JOIN takes) NATURAL JOIN section
WHERE dept_name = 'Physics' AND building = 'Watson';
```

Note that we can't use the 'building' given in the 'department' table, since we need the building in which the student attends classes, and not the building corresponding to the student's dept\_name. The output of the above is in the following table (next page):

ID	name
44553	Peltier
45678	Levy

## 4.2 (b) Which students have A grade as well as C grade?

The code and output image for this are as follows:

```
SELECT ID, name FROM (
SELECT DISTINCT A.ID
FROM(
    SELECT * FROM takes
    ) AS A, takes
WHERE A.grade = 'A' AND takes.grade = 'C' AND A.ID = takes.ID
) AS B NATURAL JOIN student;
```

ID	name
12345	Shankar

## 4.3 (c) Where do classes happen on Wednesday?

The code and output image for this are as follows:

```
SELECT DISTINCT building, room_number
FROM section NATURAL JOIN time_slot
WHERE day = 'W';
```

building	room_number
Painter	514
Packard	101
Taylor	3128
Watson	120
Watson	100

## 5 For reference: Given university Schema

Schema Diagram for University Database

