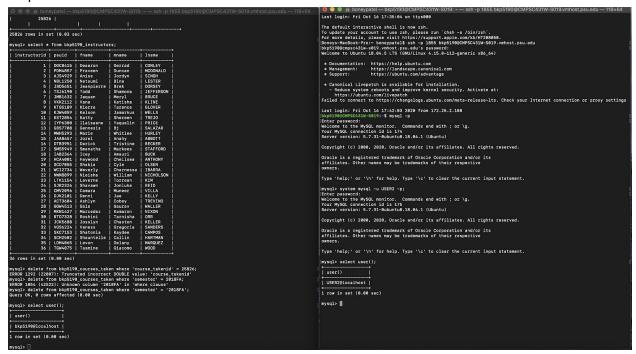
Step 3:



Step 4:

mysql> create table bkp5190_temp as select * from bkp5190_instructors;
Query OK, 36 rows affected (0.04 sec)
Records: 36 Duplicates: 0 Warnings: 0

mysql> select * from bkp5190 temp;

+	+	+ fname +	+ mname +	++ lname
1	DGC8415	Deaaron	Gerrad	CONLEY
2	PDM4857	Praveen	Duncan	MCDONALD
3	AJS4929	Anise	Jordyn	SINGH
4	NBL1250	Natsumi	Bina	LESTER
5	JBD5651	Jeanpierre	Brek	DORSEY
6	TSJ6190	Todd	Shamona	JEFFERSON
7	JMB1632	Jaquan	Meryl	BRUCE
8	VKK2112	Vana	Katisha	KLINE
9	KTG5189	Kierre	Tarence	GLOVER
10	KJW4059	Kelson	Jamarkus	WELLS
11	KST2854	Katty	Shereen	TREJO
12	IYP6380	Ilaisaane	Yaquelin	PRICE
13	GBS7708	Gennesis	Bj	SALAZAR
14	MWH5293	Marie	Whitlee	HURLEY
15	JAA8457	Jorel	Anahy	ABBOTT
16	DTB3951	Darick	Tristine	BECKER
17	SMS5949	Smanatha	Markees	STAFFORD
18	IAB2364	Icey	Amauri	BUCK
19	HCA4001	Haywood	Chellsea	ANTHONY
20	SCO7055	Shakia	Cyle	OLSEN
21	WCI2734	Waverly	Charnessa	IBARRA

1	22	NWN8899		Nieisha		William		NICHOLSON	
	23	LTK1154		Laverne		Torrean	-	KIM	
1	24	SJR2326		Shavawn		Jonluke		REID	
1	25	CMV2096		Camara		Muneer		VILLA	
	26	DJK2101		Denni		Jae		KELLY	
1	27	ACT3604		Ashlyn		Cobey		TREVINO	
1	28	GGW4513		Gale		Gaurav		WALLER	
	29	MKN1427		Marcedez		Kamaron		NIXON	
	30	RT07328		Roshini		Tarnisha	-	ORR	
1	31	JCK5688		Josslyn		Chaston		KELLER	
	32	VGS6224		Vaness		Gregoria		SANDERS	
	33	SKC7153		Shatonia		Kaydee	-	CAMPOS	
1	34	SCH2502		Shauntelle		Callin		HARTMAN	
	35	LDM4065		Levon		Delany		MARQUEZ	
1	36	TGW4075		Tasmine		Giacomo		WOOD	
+	+		+-		+-		-+-		+

Step 5:
mysql> SELECT * FROM bkp5190_temp;

mysqr> onnor	TROFF DRPS		70_ccmp,		_	
instructorid	psuid		fname	mname	T .	lname
1	DGC8415	i	Deaaron	Gerrad	İ	CONLEY
2	PDM4857		Praveen	Duncan		MCDONALD
3	AJS4929		Anise	Jordyn		SINGH
4	NBL1250		Natsumi	Bina		LESTER
5	JBD5651		Jeanpierre	Brek		DORSEY
1 6	TSJ6190		Todd	Shamona		JEFFERSON
7	JMB1632		Jaquan	Meryl		BRUCE
8	VKK2112		Vana	Katisha		KLINE
9	KTG5189		Kierre	Tarence		GLOVER
10	KJW4059		Kelson	Jamarkus		WELLS
11	KST2854		Katty	Shereen		TREJO
12	IYP6380		Ilaisaane	Yaquelin		PRICE
13	GBS7708	1	Gennesis	Вј	ı	SALAZAR
14	MWH5293		Marie	Whitlee		HURLEY
15	JAA8457		Jorel	Anahy		ABBOTT
16	DTB3951		Darick	Tristine	ı	BECKER
17	SMS5949	1	Smanatha	Markees	ı	STAFFORD
18	IAB2364		Icey	Amauri		BUCK
19	HCA4001		Haywood	Chellsea		ANTHONY
20	SCO7055		Shakia	Cyle		OLSEN
21	WCI2734		Waverly	Charnessa	ı	IBARRA
22	NWN8899		Nieisha	William		NICHOLSON
23	LTK1154		Laverne	Torrean		KIM
24	SJR2326		Shavawn	Jonluke		REID
25	CMV2096		Camara	Muneer	ı	VILLA
26	DJK2101		Denni	Jae		KELLY
27	ACT3604		Ashlyn	Cobey		TREVINO
28	GGW4513		Gale	Gaurav		WALLER
29	MKN1427		Marcedez	Kamaron	I	NIXON
30	RTO7328		Roshini	Tarnisha	I	ORR
31	JCK5688		Josslyn	Chaston	I	KELLER
32	VGS6224		Vaness	Gregoria	ı	SANDERS
33	SKC7153		Shatonia	Kaydee	ı	CAMPOS
34	SCH2502		Shauntelle	Callin	ı	HARTMAN

Step 6:

mysql> SELECT * FROM bkp5190 temp;

instructorid	psuid +	 +.	fname	1	mname	 +	lname
1	DGC8415		Deaaron	i	Gerrad	İ	CONLEY
2	PDM4857		Praveen		Duncan		MCDONALD
3	AJS4929		Anise		Jordyn		SINGH
4	NBL1250		Natsumi		Bina		LESTER
5	JBD5651		Jeanpierre		Brek		DORSEY
6	TSJ6190		Todd		Shamona		JEFFERSON
7	JMB1632		Jaquan	1	Meryl		BRUCE
8	VKK2112		Vana		Katisha		KLINE
9	KTG5189		Kierre		Tarence		GLOVER
10	KJW4059		Kelson	1	Jamarkus		WELLS
11	KST2854		Katty	1	Shereen		TREJO
12	IYP6380		Ilaisaane		Yaquelin		PRICE
13	GBS7708		Gennesis		Вј		SALAZAR
14	MWH5293		Marie	1	Whitlee		HURLEY
15	JAA8457		Jorel	Ī	Anahy		ABBOTT
16	DTB3951		Darick	ı	Tristine	ı	BECKER
17	SMS5949		Smanatha	Ī	Markees		STAFFORD
18	*IAB2364	ı	Icey	ı	Amauri		BUCK
19	*HCA4001		Haywood		Chellsea		ANTHONY
20	*SCO7055		Shakia		Cyle		OLSEN
21	*WCI2734		Waverly		Charnessa		IBARRA
22	*NWN8899		Nieisha	1	William		NICHOLSON
23	*LTK1154		Laverne	Ī	Torrean		KIM
24	*SJR2326		Shavawn	Ī	Jonluke		REID
25	*CMV2096		Camara	I	Muneer	ı	VILLA
26	*DJK2101		Denni	Ī	Jae		KELLY
27	*ACT3604		Ashlyn	Ī	Cobey		TREVINO
28	*GGW4513		Gale	I	Gaurav	ı	WALLER
29	*MKN1427		Marcedez		Kamaron		NIXON
30	*RTO7328		Roshini	1	Tarnisha		ORR
31	*JCK5688		Josslyn		Chaston		KELLER
32	*VGS6224		Vaness	1	Gregoria		SANDERS
33	*SKC7153		Shatonia	1	Kaydee		CAMPOS
34	*SCH2502		Shauntelle	1	Callin		HARTMAN
35	*LDM4065		Levon	1	Delany		MARQUEZ
36	*TGW4075	ı	Tasmine	ī	Giacomo	i	WOOD

36 rows in set (0.00 sec)

Step 7:

mysql> select * from bkp5190_temp;

4		+-		-+-		+-		+-		+
1	instructorid	i	psuid	i	fname	i	mname		lname	İ
+		+-		-+-		+-		+-		+
	1		DGC8415	-	Deaaron	1	Gerrad		CONLEY	
	2		PDM4857		Praveen		Duncan		MCDONALD	
	3		AJS4929		Anise		Jordyn		SINGH	
	4		NBL1250		Natsumi		Bina		LESTER	
	5		JBD5651		Jeanpierre		Brek		DORSEY	
-	6		TSJ6190		Todd		Shamona		JEFFERSON	1

```
7 | JMB1632 | Jaquan | Meryl | BRUCE |
8 | VKK2112 | Vana | Katisha | KLINE |
         9 | KTG5189 | Kierre | Tarence | GLOVER |
         10 | KJW4059 | Kelson
                              | Jamarkus | WELLS |
         11 | KST2854 | Katty
                             | Shereen | TREJO
         12 | IYP6380 | Ilaisaane | Yaquelin | PRICE
         13 | GBS7708 | Gennesis | Bj | SALAZAR |
         14 | MWH5293 | Marie | Whitlee | HURLEY |
         15 | JAA8457 | Jorel
                             | Anahy | ABBOTT
         16 | DTB3951 | Darick
                              | Tristine | BECKER
         17 | SMS5949 | Smanatha | Markees | STAFFORD |
         18 | IAB2364 | Icey | Amauri | BUCK
         19 | HCA4001 | Haywood | Chellsea | ANTHONY |
         20 | SCO7055 | Shakia | Cyle | OLSEN
         21 | WCI2734 | Waverly | Charnessa | IBARRA
         22 | NWN8899 | Nieisha | William | NICHOLSON |
                             | Torrean
                                        | KIM
         23 | LTK1154 | Laverne
         24 | SJR2326 | Shavawn | Jonluke | REID
         25 | CMV2096 | Camara | Muneer | VILLA
                              | Jae
         26 | DJK2101 | Denni
                              Copey | TREVINO | Gaurav | Watt
                                        | KELLY
         28 | GGW4513 | Gale
         29 | MKN1427 | Marcedez | Kamaron | NIXON
         30 | RTO7328 | Roshini
                               | Tarnisha | ORR
         31 | JCK5688 | Josslyn | Chaston | KELLER
                             | Gregoria | SANDERS
         32 | VGS6224 | Vaness
         33 | SKC7153 | Shatonia | Kaydee | CAMPOS
         34 | SCH2502 | Shauntelle | Callin
                                        | HARTMAN
         35 | LDM4065 | Levon | Delany | MARQUEZ
         36 | TGW4075 | Tasmine | Giacomo | WOOD
+----+
```

Step 8:

```
mysql> update bkp5190_temp set fname = concat('?', fname) where instructorid = 1;
ERROR 1205 (HY000): Lock wait timeout exceeded; try restarting transaction
```

When I ran this command, the request timed out because there was a transaction started with user1 already and when user2 tries updating the table, it cannot because user1 is currently changing it and has not yet finished the transaction.

Step 9:

Now, since the changes have been committed from user1, the changes are also reflected in user2's view of the table. Therefore, there are now stars preceding the psuid starting from 18 and on. Note: Nothing happened after the commit was run on user1 in terms of looking back at user2.

From user1:

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

Step 10:

```
mysql> select * from bkp5190_temp;
```

instructorid	psuid		fname		mname		lname	I
+ 1	+ DGC8415	+ · 	Deaaron	+.	 Gerrad	+ - 	CONLEY	+
1 2	PDM4857	i	Praveen	i	Duncan	I	MCDONALD	i
3	AJS4929	i	Anise	i	Jordyn	i	SINGH	i
4	NBL1250	i	Natsumi	i	Bina	i	LESTER	i
I 5	JBD5651	i	Jeanpierre	i	Brek	i	DORSEY	i
6	TSJ6190	İ	Todd	i	Shamona	ĺ	JEFFERSON	İ
7	JMB1632	İ	Jaquan	i	Meryl	ĺ	BRUCE	İ
8	VKK2112	İ	Vana	i	Katisha	ĺ	KLINE	İ
9	KTG5189	İ	Kierre	i	Tarence	ĺ	GLOVER	İ
10	KJW4059	İ	Kelson	i	Jamarkus	ĺ	WELLS	İ
11	KST2854	İ	Katty	i	Shereen	ĺ	TREJO	İ
12	IYP6380	İ	Ilaisaane	i	Yaquelin	ĺ	PRICE	İ
13	GBS7708	İ	Gennesis	İ	Вj	ĺ	SALAZAR	İ
14	MWH5293	ı	Marie	ı	Whitlee	ı	HURLEY	1
15	JAA8457	ı	Jorel	ı	Anahy	ı	ABBOTT	1
16	DTB3951	ı	Darick	ı	Tristine	ı	BECKER	1
17	SMS5949	ı	Smanatha	ı	Markees	ı	STAFFORD	1
18	*IAB2364		Icey	ı	Amauri		BUCK	
19	*HCA4001		Haywood	ı	Chellsea		ANTHONY	
20	*SCO7055		Shakia	ı	Cyle		OLSEN	
21	*WCI2734	ı	Waverly	ı	Charnessa	ı	IBARRA	1
22	*NWN8899		Nieisha	I	William		NICHOLSON	
23	*LTK1154		Laverne	I	Torrean		KIM	
24	*SJR2326		Shavawn	I	Jonluke		REID	
25	*CMV2096		Camara	ı	Muneer		VILLA	
26	*DJK2101		Denni	ı	Jae		KELLY	
27	*ACT3604		Ashlyn	Ī	Cobey		TREVINO	
28	*GGW4513		Gale	I	Gaurav		WALLER	
29	*MKN1427		Marcedez	I	Kamaron		NIXON	
30	*RTO7328		Roshini	ı	Tarnisha		ORR	
31	*JCK5688		Josslyn	I	Chaston		KELLER	
32	*VGS6224		Vaness		Gregoria		SANDERS	
33	*SKC7153		Shatonia		Kaydee		CAMPOS	
34	*SCH2502		Shauntelle		Callin		HARTMAN	
35	*LDM4065		Levon	I	Delany		MARQUEZ	
36	*TGW4075		Tasmine	I	Giacomo		WOOD	
+	+	+		+ -		+-		+

Step 11: ALTER TABLE bkp5190_tmp2 ADD PRIMARY KEY(courses_takenid);

mysql> ALTER TABLE bkp5190_tmp2 ADD PRIMARY KEY(course_takenid);
Query OK, 0 rows affected (0.55 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> describe bkp5190_tmp2;

Field	+ Type	Null	Key	Default	Extra
course_takenid		NO NO NO NO	PRI	O NULL NULL NULL	

5 rows in set (0.00 sec)

Step 12:

mysql> select * from bkp5190 tmp2 ORDER BY course takenid DESC LIMIT 10;

+	++		+	++
course_takenid		course	grade	semester
+	++		+	++
25825	BBP4828	CMPSC-ELECTIVE03	l C	2018FA
25824	BBP4828	CMPSC-ELECTIVE02	B+	2018FA
25823	BBP4828	CMPSC461	C+	2018FA
25822	BBP4828	CMPSC464	l C	2018FA
25821	BBP4828	CMPSC465	B+	2018FA
25820	BBP4828	CMPSC360	l C	2018 SP
25819	BBP4828	CMPEN331	B	2018 SP
25818	BBP4828	PHYS212	C+	2018 SP
25817	BBP4828	MATH220	B-	2017FA
25816	BBP4828	1STYEARSEM	D	2018 SP
+	++		+	++

10 rows in set (0.00 sec)

Step 13:

```
mysql> START TRANSACTION;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> UPDATE bkp5190_tmp2 SET course = concat('@', course) WHERE
course_takenid>=25816;
```

Query OK, 10 rows affected (0.00 sec)
Rows matched: 10 Changed: 10 Warnings: 0

mysql> select * from bkp5190_tmp2 ORDER BY course_takenid DESC LIMIT 10; +-----+

course_takenid		course	grade	
25825 25824 25823 25822 25821 25820 25819 25818	BBP4828 BBP4828 BBP4828 BBP4828 BBP4828 BBP4828 BBP4828 BBP4828 BBP4828 BBP4828	@CMPSC-ELECTIVE03 @CMPSC-ELECTIVE02 @CMPSC461 @CMPSC464 @CMPSC465 @CMPSC360 @CMPEN331 @PHYS212 @MATH220 @1STYEARSEM	C	2018FA 2018FA 2018FA 2018FA 2018FA 2018FA 2018 SP 2018 SP 2018 SP 2017FA 2018 SP
+	++		+	++

10 rows in set (0.00 sec)

Step 14:

mysql> select * from bkp5190_tmp2 ORDER BY course_takenid DESC LIMIT 10;

	course_takenid		-		course	_		semester	
i					CMPSC-ELECTIVE03			2018FA	i
	25824		BBP4828	1	CMPSC-ELECTIVE02	B+	Ī	2018FA	
	25823		BBP4828		CMPSC461	C+		2018FA	
	25822		BBP4828		CMPSC464	С		2018FA	
	25821		BBP4828		CMPSC465	B+		2018FA	

Step 15:

mysql> SELECT * FROM bkp5190_tmp2 ORDER BY course_takenid LIMIT 10;
+-----+
| course_takenid | psuid | course | grade | semester |
+-----+
1	CJM1141	GENED-GH2	B	2016FA
2	CJM1141	GENED-GN1	B	2016FA
3	CJM1141	GENED-GN2	C	2016FA
4	CJM1141	GENED-GS2	C	2016FA
5	CJM1141	GENED-GA1	B	2016FA
6	CJM1141	GENED-GA2	B-	2017 SP
7	CJM1141	GENED-GHA	B	2017 SP

| 2017 SP

| 2017 SP

9 | CJM1141 | CMPSC121 | B-

10 | CJM1141 | CMPSC122 | B-

+----+

10 rows in set (0.00 sec)

Step 16:

```
mysql> update bkp5190_tmp2 set grade = "F" where course_takenid <= 10;</pre>
Query OK, 10 rows affected (0.00 sec)
Rows matched: 10 Changed: 10 Warnings: 0
mysql> SELECT * FROM bkp5190 tmp2 ORDER BY course takenid LIMIT 10;
+----+
| course takenid | psuid | course | grade | semester |
+----+
           1 | CJM1141 | GENED-GH2 | F | 2016FA
           2 | CJM1141 | GENED-GN1 | F
                                   | 2016FA
                                  | 2016FA
           3 | CJM1141 | GENED-GN2 | F
           4 | CJM1141 | GENED-GS2 | F
                                  | 2016FA
           5 | CJM1141 | GENED-GA1 | F
                                  | 2016FA
           6 | CJM1141 | GENED-GA2 | F
                                  | 2017 SP |
           7 | CJM1141 | GENED-GHA | F
                                   | 2017 SP
           8 | CJM1141 | MATH140 | F
                                   | 2017 SP
           9 | CJM1141 | CMPSC121 | F
                                   | 2017 SP
          10 | CJM1141 | CMPSC122 | F | 2017 SP
+----+
```

Step 17:

10 rows in set (0.00 sec)

From research and prior video lectures, I learned that MySQL has a system implemented by default for repeatable reads. By this, when we tried to update in step 8, that specific row was

already selected and locked (in terms of using instructorid as the identifier). With this in mind, when we go to update from user2 when user1 is still within the transaction and has not yet committed, we run into a timeout error and the second update does not work. On the other hand, steps 13-16 does not specifically select the rows and lock them. Now when we perform 2 updates: one for the course from user1 and one for the grade from user2, both are executed and do not time out. Additionally, the start transaction from user1 during the second set of updates did not affect what user2 was able to change with the tables, other than simply having 2 different tables displayed (one with the "@" and one with the "F" for all grades). I believe this notion is highly important to keep in mind when working with databases since multiple users will often be looking at and trying to modify the same tables. If we use the second way when working in a more professional environment, then multiple people are able to complete work on the same table and not have to wait for one person to finish altering and committing every time (in turn saving time and money).