# CSE 5330/7330 Fall 2018 Phase 3 Functional Requirements

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Start with your database populated with the data provided.

Database used: MySQL

Added a new table called insp\_code\_cost which stores the inspection\_code, begin\_date, end\_date and cost. This table is important to retain the information of cost history on inspection\_code. The new tables are as follows:

A new function has been written to retrieve the cost of an inspection\_code based on date.

```
return ret;
end;
$
delimiter;
```

Alter table inspector add column RetiredDate date default NULL;

A new column for inspector has also been added to keep track of the inspector's retirement.

Initial state of the database: (All select statements)

```
mysal> use project;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
Database changed
mysal> show tables;
+----+
| Tables_in_project |
+----+
| Builders
| Building
I INSP_CODE_COST
| Inspection_History |
| Inspection_type |
l inspector
| pending_inspection |
| Prerequisite
+----+
8 rows in set (0.00 sec)
mysql>
```

#### **Builders:**

# Building:

mysql> select \* from building;

+	+	+	+	++
Address	Builder_ID	Type	Size	DateFirstActivity
+	+	+	+	
100 Industrial Ave., Fort Worth, TX	23456	l commercial	100000	2005-06-01
100 Main St., Dallas, TX	12345	l commercial	250000	1999-12-31
100 Winding Wood, Carrollton, TX	45678	l residential	2500	NULL I
101 Industrial Ave., Fort Worth, TX	23456	l commercial	80000	2005-06-01
102 Industrial Ave., Fort Worth, TX	1 23456	l commercial	75000	2005-06-01
102 Winding Wood, Carrollton, TX	45678	l residential	2800	NULL I
103 Industrial Ave., Fort Worth, TX	1 23456	l commercial	50000	2005-06-01
104 Industrial Ave., Fort Worth, TX	1 23456	l commercial	80000	2005-06-01
105 Industrial Ave., Fort Worth, TX	23456	l commercial	90000	2005-06-01
210 Cherry Bark Lane, Plano, TX	12321	l residentail	3200	2016-10-01
212 Cherry Bark Lane, Plano, TX	12321	l residentail	I NULL	NULL I
214 Cherry Bark Lane, Plano, TX	12321	l residentail	I NULL	NULL I
216 Cherry Bark Lane, Plano, TX	12321	l residentail	I NULL	NULL I
300 Oak St., Dallas, TX	12345	l residential	3000	2000-01-01
302 Oak St., Dallas, TX	12345	l residential	4000	2001-02-01
304 Oak St., Dallas, TX	12345	l residential	1500	2002-03-01
306 Oak St., Dallas, TX	12345	l residential	1500	2003-04-01
308 Oak St., Dallas, TX	12345	l residential	2000	2003-04-01
+	+	+	+	

18 rows in set (0.00 sec)

## Insp\_code\_cost

mysql> mysql> select \* from insp\_code\_cost;

+	+		+		+	+
l Code	e 1	begin	I	end	I	Cost I
+	+		+-		+	+
ELE	- 1	1984-01-01	ı	2018-11-19	١	100 I
ELE	- 1	2018-11-20	ı	NULL	I	150 I
I FN2	- 1	1984-01-01	ı	NULL	I	150 I
I FN3	- 1	1984-01-01	ı	NULL	I	150 I
I FNL	- 1	1984-01-01	ı	NULL	I	200 I
I FRM	- 1	1984-01-01	ı	NULL	I	100 I
I HAC	- 1	1984-01-01	ı	NULL	I	100 I
HIS	- 1	1984-01-01	ı	NULL	I	100 I
I PLU	- 1	1984-01-01	ı	NULL	I	100 I
I POL	- 1	1984-01-01	ı	NULL	I	50 I
I SAF	- 1	1984-01-01	ı	NULL	١	50 I
+	+		+		+	+

11 rows in set (0.00 sec)

# Inspection\_history

mysql> select \* from inspection\_history;

++	-+	+	+	+	++
id   Date	l Type	Inspector_ID	l score	l notes	building
++	-+	+	+	+	++
1   2018-10-01	I FRM	11103		l no problems noted	100 Winding Wood, Carrollton, TX
2   2018-10-01	I FRM	11101	100	l no problems noted	300 Oak St., Dallas, TX
3   2018-10-01	I FRM	11102	100	l no problems noted	302 Oak St., Dallas, TX
4   2018-10-02	I PLU	11101	90	l minor leak, corrected	300 Oak St., Dallas, TX
5   2018-10-02	I PLU	11102	1 25	l massive leaks	302 Oak St., Dallas, TX
6   2018-10-03	I ELE	11101	1 80	l exposed junction box	300 Oak St., Dallas, TX
7   2018-10-04	I HAC	11101	1 80	l duct needs taping	300 Oak St., Dallas, TX
8   2018-10-05	I FNL	11101	90	l ready for owner	300 Oak St., Dallas, TX
9   2018-10-08	I PLU	11102	1 50	l still leaking	302 Oak St., Dallas, TX
10   2018-10-12	I FRM	11103	l 85	l no issues but messy	210 Cherry Bark Lane, Plano, TX
11   2018-10-12	I PLU	11102	1 80	l no leaks, but messy	302 Oak St., Dallas, TX
12   2018-10-14	I SAF	11104	100	l no problems noted	210 Cherry Bark Lane, Plano, TX
13   2018-10-14	ELE	11102	100	l no problems noted	302 Oak St., Dallas, TX
14   2018-10-20	I PLU	11103	100	l everything working	100 Winding Wood, Carrollton, TX
15   2018-10-25	ELE	11103	100	I no problems noted	100 Winding Wood, Carrollton, TX
16   2018-11-01	I FRM	11103	100	l no problems noted	102 Winding Wood, Carrollton, TX
17   2018-11-01	I HAC	11102	1 80	l duct needs taping	302 Oak St., Dallas, TX
18   2018-11-02	I HAC	11103	100	I no problems noted	100 Winding Wood, Carrollton, TX
19   2018-11-02	I PLU	11103	1 90	I minor leak, corrected	102 Winding Wood, Carrollton, TX
20   2018-11-02	I FRM	11105	100	l tbd	105 Industrial Ave., Fort Worth, TX
21   2018-11-02	I FNL	11102	90	l ready for owner	302 Oak St., Dallas, TX
22   2018-11-03	ELE	11103	1 80	l exposed junction box	102 Winding Wood, Carrollton, TX
23   2018-11-04	I PLU	11103		I duct needs sealing	210 Cherry Bark Lane, Plano, TX
24   2018-11-05	I POL	11105	90	l ready for owner	210 Cherry Bark Lane, Plano, TX
25   2018-11-06	I FRM	11105		l okay	100 Industrial Ave., Fort Worth, TX
26   2018-11-08	I PLU	11102		l no leaks	100 Industrial Ave., Fort Worth, TX
27   2018-11-12	I POL	11102		l pool equipment okay	100 Industrial Ave., Fort Worth, TX
28   2018-11-14	I FN3	11102		I no problems noted	100 Industrial Ave., Fort Worth, TX
++	-+	+	+	+	++

28 rows in set (0.00 sec)

### Inspection\_type

```
mysql> mysql> select * from inspection_type;
+----+
| Code | Type
+----+
| ELE | Electrical
| FN2 | Final - 2 needed | |
| FN3 | Final - plumbing |
| FNL | Final
| FRM | Framing
| HAC | Heating/Cooling
| HIS | Historical accuracy |
| PLU | Plumbing
I POL I Pool
| SAF | Safety
+----+
10 rows in set (0.00 sec)
```

### Inspector

mysql> select \* from inspector;

### Pending\_inspection

# Prerequisite

Inspection_	code   Prerequisite_code
+	+
I FN2	ELE
I HAC	I ELE
I ELE	I FRM
I PLU	I FRM
I FNL	I HAC
I FN2	I PLU
I FN3	I PLU
I FNL	I PLU
I POL	l PLU

Everyone: Write queries (and show the results) to answer the following questions:

1. List all buildings (building#, address, type) that have not passed a final (FNL, FN2, FN3) inspection.

### Query:

select b.address from building b where b.address not in (select building from inspection\_history where score >= 75 and type like 'FN%'); Result:

```
mysql> select b.address from building b where b.address not in
   -> (select building from inspection_history where score >= 75 and type like 'FN%');
+----+
+----+
I 210 Cherry Bark Lane, Plano, TX
| 212 Cherry Bark Lane, Plano, TX
| 214 Cherry Bark Lane, Plano, TX
| 216 Cherry Bark Lane, Plano, TX
| 100 Main St., Dallas, TX
I 304 Oak St., Dallas, TX
| 306 Oak St., Dallas, TX
I 308 Oak St., Dallas, TX
| 101 Industrial Ave., Fort Worth, TX |
| 102 Industrial Ave., Fort Worth, TX |
| 103 Industrial Ave., Fort Worth, TX |
| 104 Industrial Ave., Fort Worth, TX |
| 105 Industrial Ave., Fort Worth, TX |
| 100 Winding Wood, Carrollton, TX
| 102 Winding Wood, Carrollton, TX
+----+
15 rows in set (0.00 sec)
mysql>
```

2. List the id, name of inspectors who have given at least one failing score.

```
Query:
```

```
select id, name from inspector where id in (select inspector_id from inspection_history where score < 75); Result:
```

3. What inspection type(s) have never been failed?

## Query:

```
select code from inspection_type where code not in ( select type from inspection_history where score < 75); Result:
```

```
mysql> select code from inspection_type where code not in (
   -> select type from inspection_history where score < 75);
+----+
I code I
+----+
I ELE I
I FN2 I
I FN3 I
I FNL I
I FRM I
I HAC I
| HIS |
I POL I
I SAF I
+----+
9 rows in set (0.01 sec)
```

4. What is the total cost of all inspections for builder 12345? Query:

select sum(get\_cost(it.code, ih.date)) from inspection\_type it join inspection\_history ih on it.code = ih.type where ih.building in (select bl.address from building bl where bl.builder\_id=12345); Result:

mysql> select sum(get\_cost(it.code, ih.date)) from inspection\_type it join

- -> inspection\_history ih on it.code = ih.type where ih.building in
- -> (select bl.address from building bl where bl.builder\_id=12345);

```
+-----+

| sum(get_cost(it.code, ih.date)) |

+-----+

| 1400 |

+-----+

1 row in set (0.03 sec)
```

5. What is the average score for all inspections performed by Inspector 102?

Query: select avg(score) from inspection\_history where inspector\_id = 11102;

Result:

mysql> select avg(score) from inspection\_history where inspector\_id = 11102;

```
+-----+
| avg(score) |
+-----+
| 80.5000 |
+-----+
1 row in set (0.00 sec)
```

6. How much revenue did FODB receive for inspections during October 2018?

Query:

select sum(get\_cost(it.code, ih.date)) from inspection\_type it join inspection\_history ih on ih.type = it.code where month(date) = 10 and year(date)=2018; Result:

mysql> select sum(get\_cost(it.code, ih.date)) from inspection\_type it join

-> inspection\_history ih on ih.type = it.code where month(date) = 10 and year(date)=2018;

```
+-----+
| sum(get_cost(it.code, ih.date)) |
+-----+
| 1550 |
```

```
+-----+
1 row in set (0.00 sec)
```

7. How much revenue was generated in 2018 by inspectors with more than 15 years seniority? Query:

select sum(get\_cost(it.code, ih.date)) from inspection\_type it join

inspection\_history ih on it.code = ih.type join

 $inspector\ i\ on\ i.id = ih.inspector\_id\ where\ i.hiredate < date\_add(sysdate(),\ interval\ -15\ year);$ 

Result:

mysql> select sum(get\_cost(it.code, ih.date)) from inspection\_type it join

- -> inspection\_history ih on it.code = ih.type join
- -> inspector i on i.id = ih.inspector id where i.hiredate < date add(sysdate(), interval -15 year);

```
+-----+

| sum(get_cost(it.code, ih.date)) |

+------+

| 1700 |

+------+

1 row in set (0.00 sec)
```

Everyone: Today, it is November 20, 2018: (Demonstrate  $\equiv$  show the query and result)

8. Demonstrate the adding of a new 1600 sq ft residential building for builder #34567, located at 1420 Main St., Lewisville TX.

Oueries:

- 1) select \* from building where builder\_id=34567;
- 2) insert into building values ('1420 Main St., Lewisville, TX', 34567, 'residential', 1600, NULL);
- 3) select \* from building where builder\_id=34567;

Results:

mysql> select \* from building where builder\_id=34567;

Empty set (0.00 sec)

```
mysql> insert into building values ('1420 Main St., Lewisville, TX', 34567, 'residential', 1600, NULL);
Query OK, 1 row affected (0.02 sec)
mysql> select * from building where builder_id=34567;
+-----+
                                           | Size | DateFirstActivity |
                        | Builder_ID | Type
I Address
+-----+
                            34567 | residential | 1600 | NULL
| 1420 Main St., Lewisville, TX |
+-----+
1 row in set (0.00 sec)
   9. Demonstrate the adding of an inspection on the building you just added. This framing
     inspection occurred on 11/21/2018 by inspector 104, with a score of 50, and note of "work not
     finished."
   Ouery: start transaction;
     update building set datefirstactivity = '2018-11-21' where
     address = '1420 Main St., Lewisville, TX';
     insert into Inspection_History (Date, Type, Inspector_id, score, notes, building)
     values ('2018-11-21', 'FRM', 104, 50, 'work not finished', '1420 Main St., Lewisville, TX');
   commit:
   Result:
 mysal> start transaction;
 Query OK, 0 rows affected (0.00 sec)
       update building set datefirstactivity = '2018-11-21' where
 mysql>
           address = '1420 Main St., Lewisville, TX';
 Query OK, 1 row affected (0.01 sec)
 Rows matched: 1 Changed: 1 Warnings: 0
       insert into Inspection_History (Date, Type, Inspector_id, score, notes, building)
 mysal>
       values ('2018-11-21', 'FRM', 104, 50, 'work not finished', '1420 Main St., Lewisville, TX');
 Query OK, 1 row affected (0.00 sec)
 mysql> commit;
 Query OK, 0 rows affected (0.01 sec)
 mysql> select * from inspection_history where date = '2018-11-21'
 +---+
             | Type | Inspector_ID | score | notes
 +---+
                          11104 | 50 | work not finished | 1420 Main St., Lewisville, TX |
 | 29 | 2018-11-21 | FRM |
```

1 row in set (0.00 sec)

10. Demonstrate changing the cost of an ELE inspection changed to \$150 effective today.

Query:

select \* from insp\_code\_cost;

Result:

```
mysql> select * from insp_code_cost;
+----+
| Code | begin
               I end | Cost |
+----+
| ELE | 1984-01-01 | NULL | 100 |
| FN2 | 1984-01-01 | NULL | 150 |
| FN3 | 1984-01-01 | NULL | 150 |
| FNL | 1984-01-01 | NULL | 200 |
| FRM | 1984-01-01 | NULL | 100 |
| HAC | 1984-01-01 | NULL | 100 |
| HIS | 1984-01-01 | NULL | 100 |
| PLU | 1984-01-01 | NULL | 100 |
| POL | 1984-01-01 | NULL |
                        50 I
| SAF | 1984-01-01 | NULL | 50 |
+----+
10 rows in set (0.00 sec)
```

```
start transaction;
```

```
update insp_code_cost set end = '2018-11-19' where code = 'ELE' and end is NULL; insert into insp_code_cost values ('ELE', '2018-11-20', NULL, 150); commit;
```

select \* from insp\_code\_cost;

```
mysql> start transaction;
Query OK, 0 rows affected (0.00 sec)
        update insp_code_cost set end = '2018-11-19' where code = 'ELE' and end is NULL;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> insert into insp_code_cost values
        ('ELE', '2018-11-20', NULL, 150);
Query OK, 1 row affected (0.00 sec)
mysql> commit;
Query OK, 0 rows affected (0.01 sec)
mysql> select * from insp_code_cost;
+----+
| Code | begin
               l end
                          | Cost |
+----+
| ELE | 1984-01-01 | 2018-11-19 | 100 |
| ELE | 2018-11-20 | NULL | 150 |
| FN2 | 1984-01-01 | NULL
                         | 150 |
| FN3 | 1984-01-01 | NULL
                         | 150 |
| FNL | 1984-01-01 | NULL
                         1 200 1
| POL | 1984-01-01 | NULL
                         l 50 l
| SAF | 1984-01-01 | NULL
                         l 50 l
+----+
11 rows in set (0.00 sec)
```

11. Demonstrate adding of an inspection on the building you just added. This electrical inspection occurred on 11/22/2018 by inspector 104, with a score of 60, and note of "lights not completed."

#### Query:

```
insert into Inspection_History (Date, Type, Inspector_id, score, notes, building)
values ('2018-11-22', 'ELE', 104, 60, 'lights not completed', '1420 Main St., Lewisville, TX');
mysql> insert into Inspection_History
    -> (Date, Type, Inspector_id, score, notes, building)
    -> values
    -> ('2018-11-22', 'ELE', 104, 60, 'lights not completed',
    -> '1420 Main St., Lewisville, TX');
ERROR 1644 (45000): Prerequisites not met
```

12. Demonstrate changing the message of the FRM inspection on 11/2/2018 by inspector #105 to "all work completed per checklist."

```
Query:
UPDATE inspection_history SET notes = 'all work completed per checklist'
WHERE inspector_id = 11105 AND date = '2018-11-02' AND type = 'FRM';
mysql> UPDATE inspection_history
   -> SET
        notes = 'all work completed per checklist'
   -> WHERE
        inspector_id = 11105
           AND date = '2018-11-02'
           AND type = 'FRM';
Query OK, 1 row affected (0.09 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> select * from inspection_history
 -> where
 -> notes like
 -> 'all work completed per checklist';
| id | Date
        | Type | Inspector ID | score | notes
                                            building
| 13 | 2018-11-02 | FRM | 11105 | 100 | all work completed per checklist | 105 Industrial
Ave., Fort Worth, TX |
----+
1 row in set (0.00 sec)
```

13. Demonstrate the adding of a POL inspection by inspector #103 on 11/28/2018 on the first building associated with builder 45678.

```
Query:
select * from building where builder_id = 45678;
insert into Inspection_History (Date, Type, Inspector_id, score, notes, building)
values ('2018-11-28', 'POL', 103, NULL, NULL, '100 Winding Wood, Carrollton, TX');
```

```
mysql> select * from building where builder_id = 45678;
```

#### Graduate:

14. Inspector #101 will retire December 1, 2018. How do you handle this?

Alter table inspector add column RetiredDate date default NULL;

The implementation would use newly added column RetiredDate which has been set to NULL by default. The table can be updated and RetiredDate can be set to whenever an inspector retires. The system doesn't allow deletion of records.

When the inspector #101 retires on December 1, 2018, his RetiredDate would be set to same.

While inserting the data into inspection\_history table, the RetiredDate of the inspector is to be checked. If the Inspection\_date is before the RetiredDate of the inspector or RetiredDate is NULL, the record can be inserted. Else rejected.

Leave your database in this state for customer final testing.

(END)