Welcome

Cassandra Certification Workshop

The Crew

DataStax Developer Advocacy Special Unit

menti.com

Available on the iPhone App Store

GET IT ON Google play

https://github.com/DataStax-Academy/workshop-cassandra-certification

Cassandra Certification Workshop

What we will cover:

- ➔ Which certification and what resources?
- ➔ Steps for certification
- ➔ DS201 (Foundation) practice
- ➔ DS210 (Admin) practice
- ➔ DS220 (Data Modeling) practice
- ➔ Resources

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Which certification should I get?

ADMINISTRATOR
CERTIFICATION
ASSOCIATE LEVEL

Designed for professionals who install, configure, manage and tune the performance of Apache Cassandra clusters

database administrators
DevOps engineers
Site Reliability Engineers (SREs)

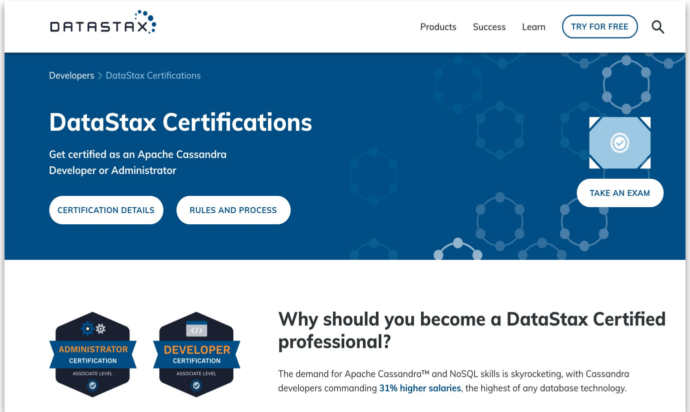
DEVELOPER
CERTIFICATION
ASSOCIATE LEVEL

Designed for professionals that use Apache Cassandra clusters to manage data

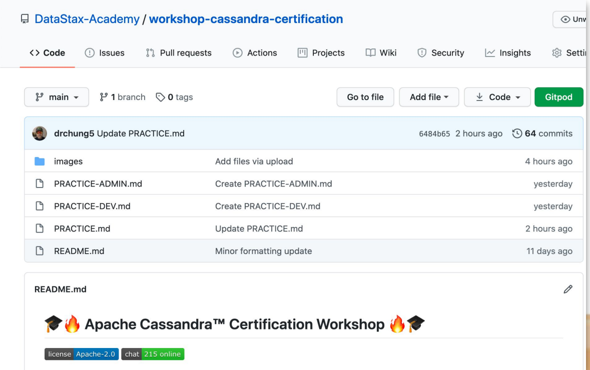
application developers
data architects
database designers
database administrators

What resources do I have?

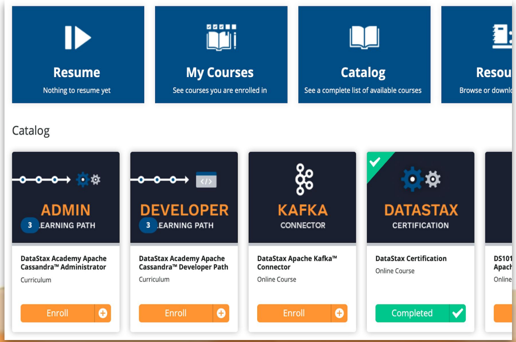
Web: www.datastax.com/dev/certifications



Github: DataStax-Academy/workshop-cassandra-certification

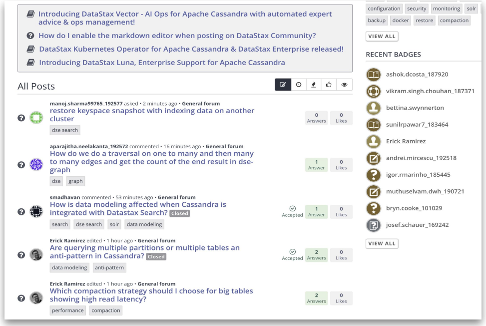


Training: academy.datastax.com



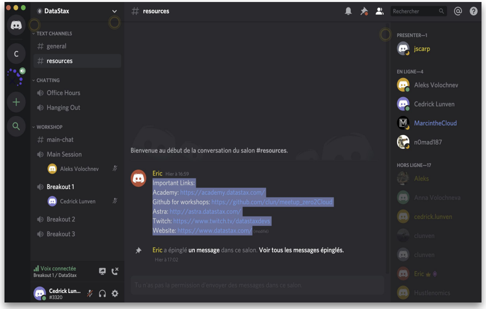
DATASTAX ACADEMY

Forum: community.datastax.com



DATASTAX COMMUNITY

Chat: bit.ly/cassandra-workshop



Discord

Cassandra Certification Workshop

What we will cover:

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- ➔ DS201 (Foundation) practice
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- ➔ DS220 (Data Modeling) practice
- ➔ Resources

Step 1

Go to
https://www.datastax.com/dev/certifications,
read through the material, and take special
note of the **Exam Rules and Process** section.

Exams are proctored.

Step 2

Choose a **learning path,**
either the
Administrator Certification or the
Developer Certification.

Step 3

Go to DataStax Academy and sign up if you have not already done so.

Academy is FREE along with all of the course content.

Step 4

DS201 & DS210

Based on the **learning path** you've chosen complete the course material within Academy.

These links are provided for you in the **Learning Paths** section at

DS201 & DS220

[https://www.datastax.com/dev/certifications.](https://www.datastax.com/dev/certifications)

Step 5

Get your exam voucher.

Complete a learning path and email academy@datastax.com.

Step 6

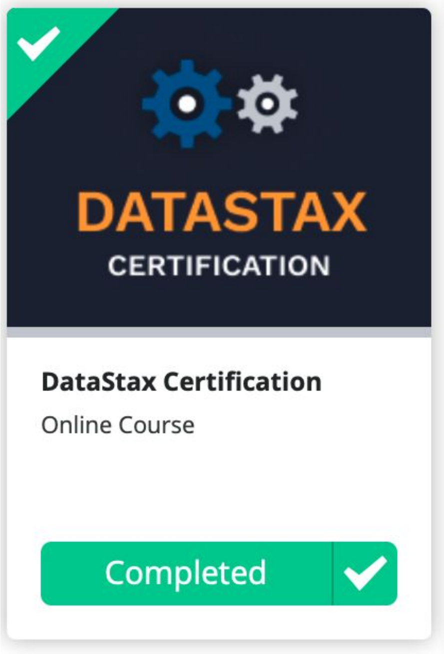
Take your exam.

Don't forget to 

Full details are at

https://github.com/DataStax-Academy/workshop-cassandra-certification

Demo the process



Cassandra Certification Workshop

- ➔ Which certification and what resources?
- ➔ Steps for certification
- ➔ DS201 (Foundation) practice
- ➔ DS210 (Admin) practice
- ➔ DS220 (Data Modeling) practice
- ➔ Resources

1. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statements:

```
CREATE TABLE roller_coasters (
    name TEXT,
    park TEXT,
    rating INT,
    PRIMARY KEY((name))
);

INSERT INTO roller_coasters (name, park, rating)
  VALUES ('Millenium Force', 'Cedar Point', 8 );

INSERT INTO roller_coasters (name, park, rating)
  VALUES ('Formula Rossa', 'Ferrari World', 9 );

INSERT INTO roller_coasters (name, park, rating)
  VALUES ('Steel Dragon 2000', 'Nagashima Spa Land', 10 );

INSERT INTO roller_coasters (name, park, rating)
  VALUES ('Millenium Force', 'Cedar Point', 7 );
```

How many rows will the roller_coasters table have after executing all the CQL statements?

A. none

B. 2

C. 3

D. 4

1. Solution

Consider the CQL statements:

```
CREATE TABLE roller_coasters (
   name TEXT,
   park TEXT,
   rating INT,
   PRIMARY KEY((name))
);

INSERT INTO roller_coasters (name, park, rating)
 VALUES ('Millenium Force', 'Cedar Point', 8 );

INSERT INTO roller_coasters (name, park, rating)
 VALUES ('Formula Rossa', 'Ferrari World', 9 );

INSERT INTO roller_coasters (name, park, rating)
 VALUES ('Steel Dragon 2000', 'Nagashima Spa Land', 10 );

INSERT INTO roller_coasters (name, park, rating)
 VALUES ('Millenium Force', 'Cedar Point', 7 );
```

How many rows will the roller_coasters table have after executing all the CQL statements?

A. none

B. 2

C. 3

D. 4

The first and fourth INSERTS use the same primary key so they cause an upsert.

Therefore only 3 rows are created.

2. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statements:

```
CREATE TABLE songs (
   artist TEXT,
   title TEXT,
   length_seconds INT,
   PRIMARY KEY((artist, title))
);

INSERT INTO songs (artist, title, length_seconds)
 VALUES ('The Beatles', 'Yesterday', 123 );

INSERT INTO songs (artist, title, length_seconds)
 VALUES ('The Beatles', 'Let It Be', 243 );

INSERT INTO songs (artist, title, length_seconds)
 VALUES ('Abba', 'Fernando', 255 );

INSERT INTO songs (artist, title, length_seconds)
 VALUES ('Frank Sinatra', 'Yesterday', 235 );
```

What is the result of executing all the CQL statements?

A. A table with 1 partition.

B. A table with 2 partitions.

C. A table with 3 partitions.

D. A table with 4 partitions.

2. Solution

Consider the CQL statements:

```
CREATE TABLE songs (
   artist TEXT,
   title TEXT,
   length_seconds INT,
   PRIMARY KEY((artist, title))
);

INSERT INTO songs (artist, title, length_seconds)
  VALUES ('The Beatles', 'Yesterday', 123 );

INSERT INTO songs (artist, title, length_seconds)
  VALUES ('The Beatles', 'Let It Be', 243 );

INSERT INTO songs (artist, title, length_seconds)
  VALUES ('Abba', 'Fernando', 255 );

INSERT INTO songs (artist, title, length_seconds)
  VALUES ('Frank Sinatra', 'Yesterday', 235 );
```

What is the result of executing all the CQL statements?

A. A table with 1 partition.

B. A table with 2 partitions.

C. A table with 3 partitions.

D. A table with 4 partitions.

The primary key consists of artist and title.

Each INSERT has a unique artist/title pair so there are no upserts and each INSERT results in a unique partition.

3. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statement:

```
CREATE TABLE cars (
    make TEXT,
    model TEXT,
    year INT,
    color TEXT,
    cost INT,
    PRIMARY KEY ((make, model), year, color)
);
```

Which of the following is a valid query for the cars table?

A.

```
SELECT * FROM cars
  WHERE make='Ford';
```

B.

```
SELECT * FROM cars
  WHERE year = 1969
  AND color = 'Red';
```

C.

```
SELECT * FROM cars
  WHERE make='Ford'
  AND model = 'Mustang'
  AND year = 1969;
```

D.

```
SELECT * FROM cars
  WHERE make='Ford'
  AND model = 'Mustang'
  AND color = 'Red';
```

3. Solution

Consider the CQL statement:

```
CREATE TABLE cars (
    make TEXT,
    model TEXT,
    year INT,
    color TEXT,
    cost INT,
    PRIMARY KEY ((make, model), year, color)
);
```

The partition key consists of make and model so A and B are excluded because the WHERE clause does not include the partition key.

C and D both include the partition key **but clustering columns can only be constrained L-R in the order they appear in the primary key.**

Since year appears before color, C is correct and D is excluded.

Which of the following is a valid query for the cars table?

A.

```
SELECT * FROM cars
  WHERE make='Ford';
```

B.

```
SELECT * FROM cars
  WHERE year = 1969
  AND color = 'Red';
```

C.

```
SELECT * FROM cars
  WHERE make='Ford'
  AND model = 'Mustang'
  AND year = 1969;
```

D.

```
SELECT * FROM cars
  WHERE make='Ford'
  AND model = 'Mustang'
  AND color = 'Red';
```

4. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statement:

```
CREATE TABLE employees (
   id TEXT,
   name TEXT,
   department TEXT,
   PRIMARY KEY ((id))
);

CREATE TABLE employees_by_department (
   id TEXT,
   name TEXT,
   department TEXT,
   PRIMARY KEY ((department), id)
);


BEGIN BATCH
   INSERT INTO employees (id, name, department)
     VALUES ('AC1123', 'Joe', 'legal');

   INSERT INTO employees_by_department (id, name, department)
     VALUES ('AC1123', 'Joe', 'legal');
APPLY BATCH;
```

Which of the following is a valid query for the cars table?

A. It is a single-partition batch that can be applied.

B. It is a single-partition batch that cannot be applied.

C. It is a multi-partition batch that can be applied.

D. It is a multi-partition batch that cannot be applied.

4. Solution

Consider the CQL statement:

```
CREATE TABLE employees (
   id TEXT,
   name TEXT,
   department TEXT,
   PRIMARY KEY ((id))
);

CREATE TABLE employees_by_department (
   id TEXT,
   name TEXT,
   department TEXT,
   PRIMARY KEY ((department), id)
);


BEGIN BATCH
   INSERT INTO employees (id, name, department)
     VALUES ('AC1123', 'Joe', 'legal');

   INSERT INTO employees_by_department (id, name, department)
     VALUES ('AC1123', 'Joe', 'legal');
APPLY BATCH;
```

Which of the following is a valid query for the cars table?

A. It is a single-partition batch that can be applied.

B. It is a single-partition batch that cannot be applied.

C. It is a multi-partition batch that can be applied.

D. It is a multi-partition batch that cannot be applied.

The two INSERTS are into different tables which makes them different partitions.

Even if one or both result in upserts there is nothing preventing this batch from being applied.

5. CQL - Developer and Administrator Exams (DS201)

Consider the table definition with a primary key omitted:

```
CREATE TABLE reviews_by_restaurant (
    name TEXT,
    city TEXT,
    reviewer TEXT,
    rating INT,
    comments TEXT,
    review_date TIMEUUID,
    PRIMARY KEY (...)
);
```

It is known that:

- Restaurant Reviews are uniquely identified by a combination of name, city and reviewer
- Restaurant Reviews are retrieved from the table using combination of name, city
- The table has multi-row partitions

What primary key does this table have?

A. PRIMARY KEY((name), reviewer, city)

B. PRIMARY KEY((name, city), reviewer)

C. PRIMARY KEY((name, reviewer), city)

D. PRIMARY KEY(reviewer, name, city)

5. Solution

Consider the table definition with a primary key omitted:

```
CREATE TABLE reviews_by_restaurant (
    name TEXT,
    city TEXT,
    reviewer TEXT,
    rating INT,
    comments TEXT,
    review_date TIMEUUID,
    PRIMARY KEY (...)
);
```

Since restaurant reviews are uniquely identified by a combination of name, city and reviewer the primary key must include all three fields.

Since restaurant reviews are retrieved from the table using combination of name, city, these two fields must comprise the partition key.

Since this table has multi-row partitions and reviewer is part of the primary key, it must be a clustering column.

It is known that:

- Restaurant Reviews are uniquely identified by a combination of name, city and reviewer
- Restaurant Reviews are retrieved from the table using combination of name, city
- The table has multi-row partitions

What primary key does this table have?

A. PRIMARY KEY((name), reviewer, city)

B. PRIMARY KEY((name, city), reviewer)

C. PRIMARY KEY((name, reviewer), city)

D. PRIMARY KEY(reviewer, name, city)

6. CQL - Developer and Administrator Exams (DS201)

Consider the table definition and the CQL query:

```
CREATE TABLE teams (
   name TEXT PRIMARY KEY,
   wins INT,
   losses INT,
   ties INT
);

SELECT * FROM teams_by_wins WHERE wins = 4;
```

Which materialized view definition can be used to support the query?

A.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    PRIMARY KEY((name), wins);
```

B.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    PRIMARY KEY((wins), name);
```

C.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    WHERE name IS NOT NULL AND wins IS NOT NULL
    PRIMARY KEY((name), wins);
```

D.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    WHERE wins IS NOT NULL AND name IS NOT NULL
    PRIMARY KEY((wins), name);
```

6. Solution

Consider the table definition and the CQL query:

```
CREATE TABLE teams (
   name TEXT PRIMARY KEY,
   wins INT,
   losses INT,
   ties INT
);

SELECT * FROM teams_by_wins WHERE wins = 4;
```

Since primary key fields cannot be NULL the WHERE clause must include a NULL check.

Since the WHERE clause in the SELECT is based on wins, wins must be the partition key.

Which materialized view definition can be used to support the query?

A.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    PRIMARY KEY((name), wins);
```

B.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    PRIMARY KEY((wins), name);
```

C.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    WHERE name IS NOT NULL AND wins IS NOT NULL
    PRIMARY KEY((name), wins);
```

D.

```
CREATE MATERIALIZED VIEW IF NOT EXISTS
  teams_by_wins AS
  SELECT * FROM teams
    WHERE wins IS NOT NULL AND name IS NOT NULL
    PRIMARY KEY((wins), name);
```

7. CQL - Developer and Administrator Exams (DS201)

Consider the table definition and the CQL query:

```
CREATE TABLE restaurants_by_city (
    name TEXT,
    city TEXT,
    cuisine TEXT,
    price int,
    PRIMARY KEY ((city), name)
);

SELECT * FROM restaurants_by_city
  WHERE city = 'Sydney'
  AND cuisine = 'sushi';
```

Which secondary index can be used to support the query?

A.
```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (cuisine);
```

B.
```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (city, cuisine);
```

C.
```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (cuisine, city);
```

D.
```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (city, name, cuisine);
```

7. Solution

Consider the table definition and the CQL query:

```
CREATE TABLE restaurants_by_city (
   name TEXT,
   city TEXT,
   cuisine TEXT,
   price int,
   PRIMARY KEY ((city), name)
);

SELECT * FROM restaurants_by_city
  WHERE city = 'Sydney'
  AND cuisine = 'sushi';
```

B, C, and D are incorrect because indexes on multiple columns are not supported.

Which secondary index can be used to support the query?

A.

```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (cuisine);
```

B.

```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (city, cuisine);
```

C.

```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (cuisine, city);
```

D.

```
CREATE INDEX cuisine_restaurants_by_city_2i
  ON restaurants_by_city (city, name, cuisine);
```

8. CQL - Developer and Administrator Exams (DS201)

Which statement describes the WHERE clause in a query?

A. WHERE clauses must reference all the fields of the partition key.

B. WHERE clauses must reference all the fields of the clustering key.

C. WHERE clauses must reference all the fields of the primary key.

D. WHERE clauses must reference all the fields of the partition key and clustering key.

8. Solution

Which statement describes the WHERE clause in a query?

A. WHERE clauses must reference all the fields of the partition key.

B. WHERE clauses must reference all the fields of the clustering key.

C. WHERE clauses must reference all the fields of the primary key.

D. WHERE clauses must reference all the fields of the partition key and clustering key.

Only the fields of the partition key are required.

9. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statements:

```
CREATE TYPE NAME (
    first TEXT,
    last TEXT
);

CREATE TABLE people (
    id UUID,
    name NAME,
    email TEXT,
    PRIMARY KEY((id), email)
);
```

Which INSERT statement can be used to insert a row in the people table?

A.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), {first:'foo', last:'bar'}, 'foo@datastax.com' );
```

B.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), name: {'foo', 'bar'}, 'foo@datastax.com' );
```

C.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), 'foo', 'bar', 'foo@datastax.com' );
```

D.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), ('foo', 'bar), 'foo@datastax.com' );
```

9. Solution

Consider the CQL statements:

```
CREATE TYPE NAME (
   first TEXT,
   last TEXT
);

CREATE TABLE people (
   id UUID,
   name NAME,
   email TEXT,
   PRIMARY KEY((id), email)
);
```

The fields of the user defined type are passed using JSON.

Which INSERT statement can be used to insert a row in the people table?

A.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), {first:'foo', last:'bar'}, 'foo@datastax.com' );
```

B.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), name: {'foo', 'bar'}, 'foo@datastax.com' );
```

C.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), 'foo', 'bar', 'foo@datastax.com' );
```

D.

```
INSERT INTO people (id, name, email)
  VALUES (UUID(), ('foo', 'bar'), 'foo@datastax.com' );
```

10. CQL - Developer and Administrator Exams (DS201)

Consider the CQL statements:

```
CREATE TABLE emails_by_user (
    username TEXT,
    email TEXT,
    description TEXT,
    nickname TEXT STATIC,
    PRIMARY KEY((username), email)
);

INSERT INTO emails_by_user (username, email, description, nickname)
  VALUES (‘dc1234’, 'david@datastax.com', 'work', 'Dave');

INSERT INTO emails_by_user (username, email, description, nickname)
  VALUES (‘dc1234’, 'david@gmail.com', 'personal', 'Dave');

UPDATE emails_by_user SET nickname = 'Davey', description = 'school'
  WHERE username = ‘dc1234’ AND email = 'david@gmail.com';

SELECT * FROM emails_by_user WHERE username = ‘dc1234’;
```

What is the result of executing theses CQL statements?

A.

```
username  | email                | nickname | description
----------+----------------------+----------+------------
   dc1234 | david@datastax.com   |     Dave |        work
   dc1234 |    david@gmail.com   |    Davey |      school
```

B.

```
username  | email                | nickname | description
----------+----------------------+----------+------------
   dc1234 | david@datastax.com   |    Davey |        work
   dc1234 |    david@gmail.com   |    Davey |      school
```

C.

```
username  | email                | nickname | description
----------+----------------------+----------+------------
   dc1234 |    david@gmail.com   |    Davey |      school
```

D.

```
username  | email                | nickname | description
----------+----------------------+----------+------------
   dc1234 | david@datastax.com   |     Dave |        work
```

10. Solution

Consider the CQL statements:

```
CREATE TABLE emails_by_user (
    username TEXT,
    email TEXT,
    description TEXT,
    nickname TEXT STATIC,
    PRIMARY KEY((username), email)
);

INSERT INTO emails_by_user (username, email, description, nickname)
  VALUES ('dc1234', 'david@datastax.com', 'work', 'Dave');

INSERT INTO emails_by_user (username, email, description, nickname)
  VALUES ('dc1234', 'david@gmail.com', 'personal', 'Dave');

UPDATE emails_by_user SET nickname = 'Davey', description = 'school'
  WHERE username = 'dc1234' AND email = 'david@gmail.com';

SELECT * FROM emails_by_user WHERE username = 'dc1234';
```

Because email is a clustering column the table has one partition with two rows.

The nickname field is static so it was set to Davey for the entire partition.

What is the result of executing theses CQL statements?

A.

```
username  | email                  | nickname | description
----------+------------------------+----------+------------
   dc1234 | david@datastax.com     |     Dave |        work
   dc1234 |    david@gmail.com     |    Davey |      school
```

B.

```
username  | email                  | nickname | description
----------+------------------------+----------+------------
   dc1234 | david@datastax.com     |    Davey |        work
   dc1234 |    david@gmail.com     |    Davey |      school
```

C.

```
username  | email                  | nickname | description
----------+------------------------+----------+------------
   dc1234 |    david@gmail.com     |    Davey |      school
```

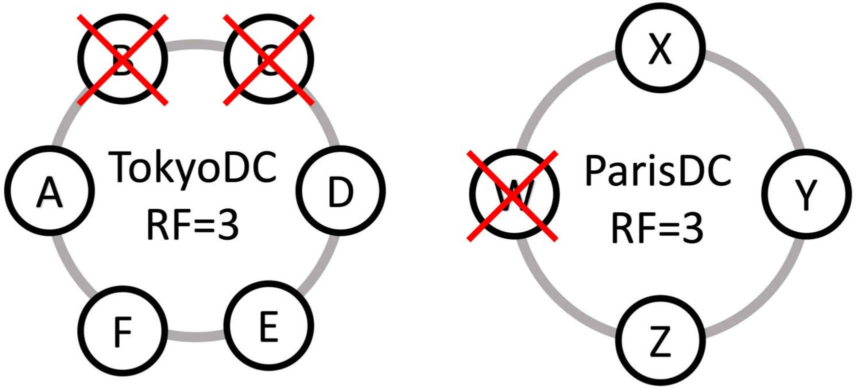
D.

```
username  | email                  | nickname | description
----------+------------------------+----------+------------
   dc1234 | david@datastax.com     |     Dave |        work
```

11. Architecture Exams (DS201)

Consider the two datacenters in the diagram.

TokyoDC has six nodes (two failed and four active) and a replication factor of 3, and ParisDC four nodes (one failed and three active) and a replication factor of 3.



What is a valid statement about a read request made at consistency level of LOCAL QUORUM to coordinator node Z in ParisDC?

A. The request will be handled in data center ParisDC and will fail.

B. The request will be handled in data center ParisDC and will succeed.

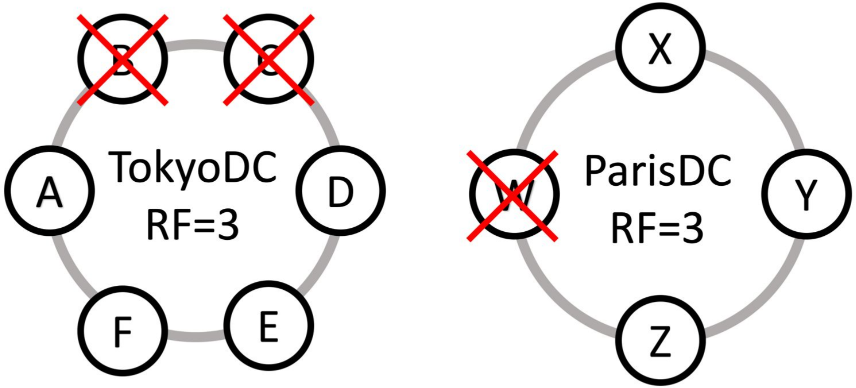
C. The request will be retried in data center TokyoDC and will fail.

D. The request will be retried in data center TokyoDC and will succeed.

11. Solution

Consider the two datacenters in the diagram.

TokyoDC has six nodes (two failed and four active) and a replication factor of 3, and ParisDC four nodes (one failed and three active) and a replication factor of 3.



What is a valid statement about a read request made at consistency level of LOCAL QUORUM to coordinator node Z in ParisDC?

A. The request will be handled in data center ParisDC and will fail.

B. The request will be handled in data center ParisDC and will succeed.

C. The request will be retried in data center TokyoDC and will fail.

D. The request will be retried in data center TokyoDC and will succeed.

LOCAL QUORUM requires a quorum (more than half) of the replicas in a the local data center to respond in order to succeed.

Since only 1 of 4 nodes have failed there will be at least 2 replicas available to handle the request. 2 is the quorum of 3, therefore the request will succeed.

12. Architecture Exams (DS201)

Consider these CQL traces:

```
activity                                                                                    | timestamp                  | source        | source_elapsed | client
--------------------------------------------------------------------------------------------+----------------------------+---------------+----------------+--------------
                                                                          Execute CQL3 query | 2020-10-09 16:18:49.223000 | 10.52.26.153 |              0 | 10.52.13.186
 Parsing INSERT INTO NAMES (id, name) VALUES (UUID(), 'Dave'); [CoreThread-0] | 2020-10-09 16:18:49.223000 | 10.52.26.153 |            328 | 10.52.13.186
                                                       Preparing statement [CoreThread-0] | 2020-10-09 16:18:49.223000 | 10.52.26.153 |            690 | 10.52.13.186
                                       Determining replicas for mutation [CoreThread-0] | 2020-10-09 16:18:49.224000 | 10.52.26.153 |           1834 | 10.52.13.186
                                                Appending to commitlog [CoreThread-0] | 2020-10-09 16:18:49.225000 | 10.52.26.153 |           2193 | 10.52.13.186
                                             Adding to names memtable [CoreThread-0] | 2020-10-09 16:18:49.225000 | 10.52.26.153 |           2326 | 10.52.13.186
                                                                        Request complete | 2020-10-09 16:18:49.225966 | 10.52.26.153 |           2966 | 10.52.13.186
```

At what elapsed time is the data persisted so that it will survive an unexpected node shutdown?

A. 690 milliseconds

B. 1834 milliseconds

C. 2193 milliseconds

D. 2966 milliseconds

12. Solution

Consider these CQL traces:

activity	timestamp	source	source_elapsed	client
Execute CQL3 query	2020-10-09 16:18:49.223000	10.52.26.153	0	10.52.13.186
Parsing INSERT INTO NAMES (id, name) VALUES (UUID(), 'Dave'); [CoreThread-0]	2020-10-09 16:18:49.223000	10.52.26.153	328	10.52.13.186
Preparing statement [CoreThread-0]	2020-10-09 16:18:49.223000	10.52.26.153	690	10.52.13.186
Determining replicas for mutation [CoreThread-0]	2020-10-09 16:18:49.224000	10.52.26.153	1834	10.52.13.186
Appending to commitlog [CoreThread-0]	2020-10-09 16:18:49.225000	10.52.26.153	2193	10.52.13.186
Adding to names memtable [CoreThread-0]	2020-10-09 16:18:49.225000	10.52.26.153	2326	10.52.13.186
Request complete	2020-10-09 16:18:49.225966	10.52.26.153	2966	10.52.13.186

At what elapsed time is the data persisted so that it will survive an unexpected node shutdown?

A. 690 milliseconds

B. 1834 milliseconds

C. 2193 milliseconds

D. 2966 milliseconds

Once data is written to commit log it will survive an unexpected node shutdown.

13. Architecture Exams (DS201)

How is Replication Factor configured in Cassandra?

A. per cluster

B. per keyspace

C. per operation

D. per node

13. Solution

How is Replication Factor configured in Cassandra?

A. per cluster

B. per keyspace

C. per operation

D. per node

Replication factor (and strategy) **MUST BE** configured when creating a keyspace.

Cassandra Certification Workshop

What we will cover:

- ➔ Which certification and what resources?
- ➔ Steps for certification
- ➔ DS201 (Foundation) practice
- ➔ DS210 (Admin) practice
- ➔ DS220 (Data Modeling) practice
- ➔ Resources

14. Administrator Exams (DS210)

What are two options for internode_encryption in Cassandra? (Choose two.)

A. client

B. node

C. rack

D. enabled

E. dc

14. Solution

What are two options for internode_encryption in Cassandra? (Choose two.)

A. client

B. node

C. rack

D. enabled

E. dc

The available options are: all, none, dc and rack.

15. Administrator Exams (DS210)

Which configuration file is used to set garbage collection properties for Cassandra?

A. cassandra.yaml

B. jvm.options

C. cassandra-env.sh

D. gc.options

15. Solution

Which configuration file is used to set garbage collection properties for Cassandra?

A. cassandra.yaml

B. jvm.options

C. cassandra-env.sh

D. gc.options

The purpose of the jvm.options file is to put JVM-specific properties (like garbage collection) in one place.

16. Administrator Exams (DS210)

Consider the table definition and how a single row is stored in one Memtable and two SSTables on a Cassandra node:

```
CREATE TABLE tests (
    id INT PRIMARY KEY,
    test TEXT,
    score int
);
```

Memtable

id: 11 timestamp: 1392353211
score: 75 timestamp: 1392353211

SSTable

id: 11 timestamp: 1204596828
test: math timestamp: 1204596828
score: 62 timestamp: 1204596828

SSTable

id: 11 timestamp: 1183608357
test: english timestamp: 1183608357
score: 48 timestamp: 1183608357

What are the current values for this row?

A.
```
id | test      | score
----+-----------+-------
 11 | english |    48
```

B.
```
id | test   | score
----+--------+-------
 11 | math |    75
```

C.
```
id | test   | score
----+--------+-------
 11 | math |    62
```

D.
```
id | test   | score
----+--------+-------
 11 | math |    48
```

16. Solution

Consider the table definition and how a single row is stored in one Memtable and two SSTables on a Cassandra node:

```
CREATE TABLE tests (
    id INT PRIMARY KEY,
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SSTable

id: 11 timestamp: 1183608357
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score: 48 timestamp: 1183608357

What are the current values for this row?

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id | test     | score
----+-----------+-------
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B.

```
id | test   | score
----+--------+-------
 11 | math |    75
```

C.

```
id | test   | score
----+--------+-------
 11 | math |    62
```

D.

```
id | test   | score
----+--------+-------
 11 | math |    48
```

Data for a row may be spread across the memtable and multiple SSTables. The row value is made up of the most recent (timestamp) value for each column.

17. Administrator Exams (DS210)

What is a valid statement about a coordinator node handling a query at consistency level THREE?

A. The coordinator node sends a direct read request to all replicas.

B. The coordinator node sends a direct read request to three replicas.

C. The coordinator node sends a background read repair request to three replicas.

D. The coordinator node sends a direct read request to one replica and digest requests to two replicas.

17. Solution

What is a valid statement about a coordinator node handling a query at consistency level THREE?

A. The coordinator node sends a direct read request to all replicas.

B. The coordinator node sends a direct read request to three replicas.

C. The coordinator node sends a background read repair request to three replicas.

D. The coordinator node sends a direct read request to one replica and digest requests to two replicas.

The coordinator node only sends a direct read request to one node and sends digest request(s) to the remainder necessary to meet the consistency level.

The coordinator node then compares the data read directly with the digest(s). If they agree the result is returned to the client.

If they do not agree the most recent timestamped result is considered current and sent to the client. The coordinator node may need to request the latest timestamped version from a replica.

18. Administrator Exams (DS210)

What is a valid statement about a write made at consistency level LOCAL_QUORUM against a keyspace with replication factor of 3?

A. The coordinator node will send a write to one node.

B. The coordinator node will send writes to two nodes.

C. The coordinator node will send writes to three nodes.

D. The coordinator node will send writes to all nodes.

18. Solution

What is a valid statement about a write made at consistency level LOCAL_QUORUM against a keyspace with replication factor of 3?

A. The coordinator node will send a write to one node.

B. The coordinator node will send writes to two nodes.

C. The coordinator node will send writes to three nodes.

D. The coordinator node will send writes to all nodes.

The coordinator node will always attempt to write to the number of nodes specified in the replication factor.

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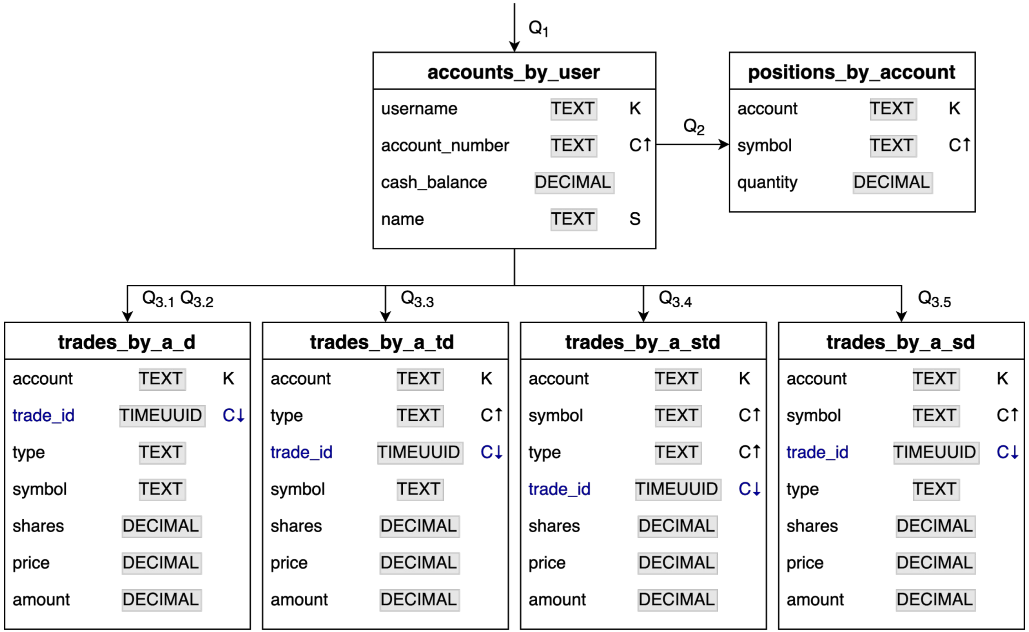
- ➔ **DS220 (Data Modeling) practice**
- ➔ Resources

19. Data Modeling (DS220)

Consider the Chebotko Diagram that captures the physical data model for investment portfolio data:



Chebotko Diagram

What is the primary key and clustering order of the table trades_by_a_std?

A.

PRIMARY KEY((account), trade_id, symbol, type)
)
WITH CLUSTERING ORDER BY (trade_id DESC, symbol ASC, type ASC);

B.

PRIMARY KEY((account), trade_id, symbol, type)
)
WITH CLUSTERING ORDER BY (trade_id DESC);

C.

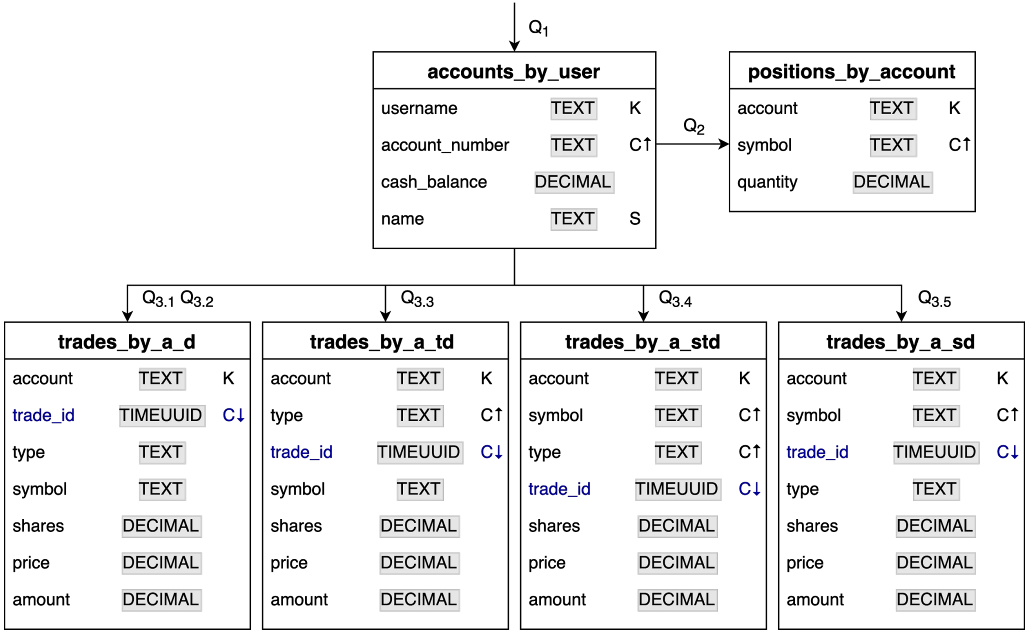
PRIMARY KEY((account), symbol, type, trade_id)
)
WITH CLUSTERING ORDER BY (trade_id DESC);

D.

PRIMARY KEY((account), symbol, type, trade_id)
)
WITH CLUSTERING ORDER BY (symbol ASC, type ASC, trade_id DESC);

19. Solution

Consider the Chebotko Diagram that captures the physical data model for investment portfolio data:



Chebotko Diagram

What is the primary key and clustering order of the table trades_by_a_std?

A.

PRIMARY KEY((account), trade_id, symbol, type)
)
WITH CLUSTERING ORDER BY (trade_id DESC, symbol ASC, type ASC);

B.

PRIMARY KEY((account), trade_id, symbol, type)
)
WITH CLUSTERING ORDER BY (trade_id DESC);

C.

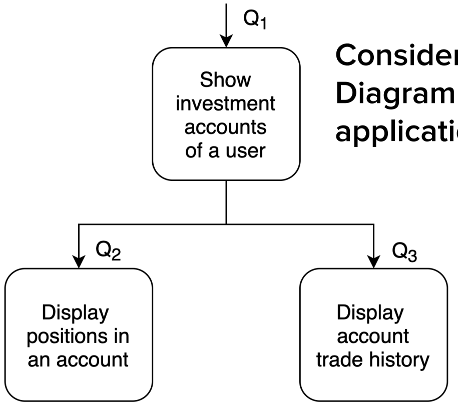
PRIMARY KEY((account), symbol, type, trade_id)
)
WITH CLUSTERING ORDER BY (trade_id DESC);

D.

PRIMARY KEY((account), symbol, type, trade_id)
)
WITH CLUSTERING ORDER BY (symbol ASC, type ASC, trade_id DESC);

In Chebotko diagrams a table lists clustering keys in the order they appear in the primary key. If the clustering order is explicitly specified for a column with WITH CLUSTERING ORDER BY clause, the clustering order for all preceding clustering key columns must also be explicitly specified.

20. Data Modeling (DS220)



Data access patterns

Q_1: Find information about all investment accounts of a user
Q_2: Find all positions in an account; order by instrument symbol (asc)
Q_3: Find all trades for an account and, optionally, a known date range, transaction type (buy/sell), and stock symbol; order by trade date (desc)
  $Q_{3.1}$: Find all trades for an account; order by trade date (desc)
  $Q_{3.2}$: Find all trades for an account and date range; order by trade date (desc)
  $Q_{3.3}$: Find all trades for an account, date range and transaction type; order by trade date (desc)
  $Q_{3.4}$: Find all trades for an account, date range, transaction type and instrument symbol; order by trade date (desc)
  $Q_{3.5}$: Find all trades for an account, date range and instrument symbol; order by trade date (desc)

Application Workflow Diagram

Consider the Application Workflow Diagram for an investment portfolio application:

Which access pattern(s) are evaluated before an application can evaluate $Q_{3.2}$?

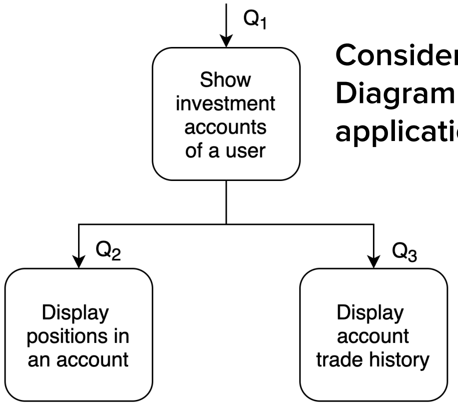
A. Q_1

B. Q_1 and Q_2

C. Q_1 and Q_3

D. Q_1, Q_3 and $Q_{3.1}$

20. Data Modeling (DS220)



Consider the Application Workflow Diagram for an investment portfolio application:

Data access patterns

Q_1: Find information about all investment accounts of a user
Q_2: Find all positions in an account; order by instrument symbol (asc)
Q_3: Find all trades for an account and, optionally, a known date range, transaction type (buy/sell), and stock symbol; order by trade date (desc)
  $Q_{3.1}$: Find all trades for an account; order by trade date (desc)
  $Q_{3.2}$: Find all trades for an account and date range; order by trade date (desc)
  $Q_{3.3}$: Find all trades for an account, date range and transaction type; order by trade date (desc)
  $Q_{3.4}$: Find all trades for an account, date range, transaction type and instrument symbol; order by trade date (desc)
  $Q_{3.5}$: Find all trades for an account, date range and instrument symbol; order by trade date (desc)

Application Workflow Diagram

Which access pattern(s) are evaluated before an application can evaluate $Q_{3.2}$?

A. Q_1

B. Q_1 and Q_2

C. Q_1 and Q_3

D. Q_1, Q_3 and $Q_{3.1}$

Q1 is the entry point. After Q1, Q2 or Q3 may be evaluated. Q3 is broken down into Q3.1 - Q3.5. The only prerequisite for Q3.1 - Q3.5 is Q1. Therefore, only Q1 must be evaluated before Q3.2

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Thank You