

# TP06: NoSQL Databases – Apache Cassandra

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## Introduction

This report presents the solution to TP06: NoSQL Databases using Apache Cassandra.<sup>1</sup> The goal is to create a keyspace, import restaurant and inspection data, and execute a series of CQL queries to explore the dataset. All screenshots are stored in the folder photo/.

## 1. Listing all Restaurants

### Query

```
SELECT * FROM Restaurant;
```

### Screenshot

ID	borough	buildingnum	cuisinetype	phone	street	zipcode	name
407880114	STATEN ISLAND	111	BOSTON MARKET	7186151598	FOREST AVENUE	10802	American   American
46166182	QUEENS	11909					
43892106	MANHATTAN	1190	LITTLE CHINATOWN'S S SABOR	7188409770	ATLANTIC AVENUE	11418	American   Thai
43530956	BROOKLYN	2272	BANGKOK THAI	2125451594	WEST 46 STREET	10836	Caribbean
41199333	BROOKLYN	2273	TJ'S TASTY CORNER	718484783	TILDEN AVENUE	11228	American
50095384	QUEENS	1190	NATHAN'S HOT DOGS	7185958180	ROOSEVELT AVENUE	11246	Chinese
50095384	STATEN ISLAND	273					
50095384	BROOKLYN	11905	YUMMY YUMMY	7184425888	PORT RICHMOND AVE	10902	Chinese
50095384	BROOKLYN	6005					
40936212	MANHATTAN	119A	EL GIGANTE KITCHEN & BAR	7180531388	FORT HAMILTON PKWY	11239	Italian
40095261	MANHATTAN	119A	EL GIGANTE KITCHEN & BAR	7180531388	WEST 75 STREET	10835	American (Puerto Rico, Cuban, Dominican, Puerto Rican, South & Central American)   American
40188763	MANHATTAN	119A	EL GIGANTE RESTAURANT & PUPUSERIA	2327955409	BROADWAY	10835	American
50019248	BROOKLYN	604	THE BROOKLYN	21275757828	EAST 54 STREET	10822	Delicatessen
50015173	MANHATTAN	1190	COCONUT DELI & GRILL	3474629400	E 102ND ST	11236	Japanese

Figure 1: Result of SELECT \* FROM Restaurant

<sup>1</sup>Based on the official TP instructions.

## Overview

This query returns all rows from the `Restaurant` table (about 25,624 restaurants imported from CSV).

## 2. Listing all Restaurant Names

### Query

```
SELECT name FROM Restaurant;
```

cqlsh:resto_ny> SELECT name FROM Restaurant;	--MORE---
name	name
BOSTON MARKET	CHOLE'S RESTAURANT & LOUNGE
LENTHAN'S SALOON	SUNDAES AND CONES
BANGKOK HOUSE	ON 14TH STREET
TJ'S TASTY CORNER	STARBUCKS
NATHAN'S HOT DOGS	HALE & HEARTY SOUP
YUMMY YUMMY	MURRAY'S CHEESE BAR
KING'S KITCHEN	GOLDEN KRUST
CESCA	EATING TREE
EL GUANACO RESTAURANT & PUPUSERIA	DRINK
THE BROOK	BISOUX MARKET/WORLD BEAN
LEO'S DELI & GRILL	TO YOUR HEALTH & HAPPINESS
KAEDÉ JAPANESE RESTAURANT	P.J.'S
JOHN'S PIZZA	PINKBERRY
RICE & BEANS LECHONERA	KING OF TANDOOR
INDIAN EXPRESS	PRONTO DELI
DOUBLETREE GREENHOUSE 36	FLUSHING HOUSE RESIDENCE FOR ADULTS (SENIOR HOME)
VIADELVA	EL PALENQUE SPORT BAR
TK VILLAGE BAKERY COMPANY	RED ROSE
BKB	WANG EASTERN
SPRING	AROY DEE THAI KITCHEN
DUNKIN' DONUTS	SUBWAY
PLANET WINGS	TSOB-TSOBE CAFE LOUNGE BAR
NEW CHINA RESTAURANT WANG INC	HEALTHY HENRY'S
JIN SUSHI & THAI	STARBUCKS
JADE ASIAN EXPRESS INC	
TIELLA RESTAURANT	

Figure 2: List of restaurant names

## Overview

This returns only the `name` column for all restaurants.

## 3. Name and Borough of Restaurant ID = 41569764

### Query

```
SELECT name, borough
```

```
FROM Restaurant  
WHERE id = 41569764;
```

## Screenshot

```
cqlsh:resto_ny> SELECT name, borough  
...   FROM Restaurant  
... WHERE id = 41569764;  
  
name      | borough  
-----+-----  
BACCHUS | BROOKLYN  
  
(1 rows)
```

Figure 3: Restaurant with ID = 41569764

## Overview

The restaurant with this ID is **BACCHUS** located in **BROOKLYN**.

## 4. Inspection Dates and Grades for Restaurant 41569764

### Query

```
SELECT inspectiondate, grade  
FROM Inspection  
WHERE idrestaurant = 41569764;
```

## Screenshot

```
cqlsh:resto_ny> SELECT name, borough
...   FROM Restaurant
... WHERE id = 41569764;

      name      | borough
-----+-----
BACCHUS | BROOKLYN

(1 rows)
cqlsh:resto_ny> SELECT inspectiondate, grade
...   FROM Inspection
... WHERE idrestaurant = 41569764;

  inspectiondate | grade
-----+-----
  2013-06-27 | null
  2013-07-08 | A
  2013-12-26 | null
  2014-02-05 | A
  2014-07-17 | null
  2014-08-06 | A
  2015-01-08 | A
  2016-02-25 | A

(8 rows)
cqlsh:resto_ny> □
```

Figure 4: Inspection history for restaurant 41569764

## Overview

A total of 8 inspections were returned, with grades alternating between A and null.

## 5. Restaurants Serving French Cuisine

### Query

```
SELECT name  
FROM Restaurant  
WHERE cuisinetype = 'French';
```

cqlsh:resto_ny> SELECT name ... FROM Restaurant ... WHERE cuisinetype = 'French';																																																																																
<table border="1"><thead><tr><th>name</th></tr></thead><tbody><tr><td>MATISSE</td></tr><tr><td>ALMANAC</td></tr><tr><td>TOUT VA BIEN</td></tr><tr><td>FELIX</td></tr><tr><td>CREPES ON COLUMBUS</td></tr><tr><td>THE BARONESS BAR</td></tr><tr><td>THE SIMONE</td></tr><tr><td>FP BAKERY</td></tr><tr><td>VIN ET FLEURS</td></tr><tr><td>CAFE BOULUD/BAR PLEIADES</td></tr><tr><td>COCOTTE</td></tr><tr><td>Bourgeois Pig</td></tr><tr><td>DELICE &amp; SARRASIN</td></tr><tr><td>LA TARTE FLAMBEE</td></tr><tr><td>JEAN GEORGES</td></tr><tr><td>MAISON MAY</td></tr><tr><td>DANIEL</td></tr><tr><td>SAJU BISTRO</td></tr><tr><td>LE PAIN QUOTIDIEN</td></tr><tr><td>CAFE CLUNY</td></tr><tr><td>BIN 71</td></tr><tr><td>CREPES CELSTES</td></tr><tr><td>JOYCE BAKESHOP</td></tr><tr><td>THE FOX AND THE CREPES</td></tr></tbody></table>	name	MATISSE	ALMANAC	TOUT VA BIEN	FELIX	CREPES ON COLUMBUS	THE BARONESS BAR	THE SIMONE	FP BAKERY	VIN ET FLEURS	CAFE BOULUD/BAR PLEIADES	COCOTTE	Bourgeois Pig	DELICE & SARRASIN	LA TARTE FLAMBEE	JEAN GEORGES	MAISON MAY	DANIEL	SAJU BISTRO	LE PAIN QUOTIDIEN	CAFE CLUNY	BIN 71	CREPES CELSTES	JOYCE BAKESHOP	THE FOX AND THE CREPES	<table border="1"><thead><tr><th></th><th>MATCH 65</th></tr></thead><tbody><tr><td>AIR FRANCE LOUNGE</td><td></td></tr><tr><td>THE TEN BELLS</td><td></td></tr><tr><td>BRASSERIE MAGRITTE</td><td></td></tr><tr><td>PAPILLON BISTRO &amp; BAR</td><td></td></tr><tr><td>LE GARAGE</td><td></td></tr><tr><td>CREDIT AGRICOLE-CBI EXECUTIVE ROOM</td><td></td></tr><tr><td>RAOULS</td><td></td></tr><tr><td>LA CREPE C'EST SI BON</td><td></td></tr><tr><td>VIVE LA CREPE</td><td></td></tr><tr><td>THE PARK BENCH CAFE &amp; CREPERIE</td><td></td></tr><tr><td>LE PAIN QUOTIDIEN</td><td></td></tr><tr><td>O CABANON</td><td></td></tr><tr><td>CAFE CHAMPIGNON</td><td></td></tr><tr><td>PERRY STREET</td><td></td></tr><tr><td>THE BROOKLYN LABEL</td><td></td></tr><tr><td>LE BILBOQUET</td><td></td></tr><tr><td>BRASSERIE COGNAC</td><td></td></tr><tr><td>TALON BAR</td><td></td></tr><tr><td>FINANCIER PATISSERIE</td><td></td></tr><tr><td>BOUCHON BAKERY</td><td></td></tr><tr><td>LE GIGOT</td><td></td></tr><tr><td>THE PANDERING PIG</td><td></td></tr><tr><td>TARTINERY</td><td></td></tr><tr><td>SANTOS ANNE</td><td></td></tr><tr><td>CAFE DADA</td><td></td></tr><tr><td>BAR SUZETTE CREPERIE</td><td></td></tr></tbody></table>		MATCH 65	AIR FRANCE LOUNGE		THE TEN BELLS		BRASSERIE MAGRITTE		PAPILLON BISTRO & BAR		LE GARAGE		CREDIT AGRICOLE-CBI EXECUTIVE ROOM		RAOULS		LA CREPE C'EST SI BON		VIVE LA CREPE		THE PARK BENCH CAFE & CREPERIE		LE PAIN QUOTIDIEN		O CABANON		CAFE CHAMPIGNON		PERRY STREET		THE BROOKLYN LABEL		LE BILBOQUET		BRASSERIE COGNAC		TALON BAR		FINANCIER PATISSERIE		BOUCHON BAKERY		LE GIGOT		THE PANDERING PIG		TARTINERY		SANTOS ANNE		CAFE DADA		BAR SUZETTE CREPERIE	
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Figure 5: French restaurants

## Overview

351 restaurants serve French cuisine.

## 6. Restaurants in BROOKLYN

### Query

```
SELECT name  
FROM Restaurant  
WHERE borough = 'BROOKLYN';
```

### Note

If Cassandra rejects the query, create an index:

```
CREATE INDEX resto_borough_idx ON Restaurant (borough);
```

```
cqlsh:resto_ny> CREATE INDEX resto_borough_idx ON Restaurant (borough);  
cqlsh:resto_ny> SELECT name  
... FROM Restaurant  
... WHERE borough = 'BROOKLYN';  
name  
-----  
TJ'S TASTY CORNER  
KING'S KITCHEN  
LEO'S PIZZA & DELI  
JIN SUSHI & THAI  
CROWN FRIED CHICKEN  
MOMO'S  
CRESCENT COFFEE SHOP  
LA ROYALE BEEF & CHEESE  
MANHATTAN BUFFET  
GREENSTREETS SALADS  
LA GUERRITA BAR  
MAMA ROZ SOUL FOOD  
HOT CHILI MEXICAN  
BROOKLYN BRIDGE GARDEN BAR  
THE CANTINE  
THE SPICE BAR  
DAVEY'S ICE CREAM  
CROWN FRIED CHICKEN  
MOMO'S  
CHINA DRAGON  
KRIMP BAGEL CAFE  
SUBWAY  
NIGHTS AND WEEKENDS BK  
EAGLE CITY TEX MEX CHINESE FOOD  
DELI & GRILL  
LAS CONCHITAS BAKERY  
PALO SANTO  
SHANG HAI FAMILY DUMPLING  
STARLINER CAFE AND MARKET  
YEMEN CAFE & RESTAURANT  
LITTLE ITALY M & O PIZZA RESTAURANT  
RECONNECT CAFE  
JOE'S PIZZA  
LUIGI'S PIZZA II  
CONSTANTINE RESTAURANT AND BAR  
FLOYD, NY  
PARKSIDE COFFEE SHOP  
IKEA  
MABLE'S SMOKEHOUSE AND BANQUET HALL  
RED MANGO  
NEW TOPPS BAKERY & RESTAURANT  
SMOKESHACK  
GEOORGIAN DELI AND BAKERY  
CHOLE'S RESTAURANT & LOUNGE  
GOLDEN KRUST  
KING OF TANDOOR  
RED ROSE  
TSOB-TSOBE CAFE LOUNGE BAR  
(6260 rows)  
cqlsh:resto_ny>
```

Figure 6: Restaurants located in BROOKLYN

### Overview

This query returns about 6,260 restaurants in Brooklyn.

## 7. Grades and Scores $\geq 10$ for Restaurant 41569764

### Query

```
SELECT grade, score
FROM Inspection
WHERE idrestaurant = 41569764
AND score >= 10
ALLOW FILTERING;
```

### Screenshot

```
cqlsh:resto_ny> SELECT grade, score
...   FROM Inspection
... WHERE idrestaurant = 41569764
... AND score >= 10
... ALLOW FILTERING;

grade | score
-----+-----
null  |    19
A     |    10

(2 rows)
```

Figure 7: Grades and scores  $\geq 10$

### Overview

Two results match the condition: score  $\geq 10$  and score = 19.

## 8. Non-null Grades with Score $> 30$

### Query

```
SELECT grade
```

```

FROM Inspection
WHERE score > 30 AND grade > ''
ALLOW FILTERING;

```

## Screenshot

```

cqlsh:resto_ny> SELECT grade, score
...   FROM Inspection
... WHERE idrestaurant = 41569764
... AND score >= 10
... ALLOW FILTERING;

grade | score
-----+-----
null  |  19
A     |  10

(2 rows)
cqlsh:resto_ny> SELECT grade
...   FROM Inspection
... WHERE score > 30 AND grade > ''
... ALLOW FILTERING;

grade
-----
C
C
C
Not Yet Graded
C
C
C
C
C
C
C

(1152 rows)

Warnings :
Read 7436 live rows and 5203 tombstone cells for
urant) >= token(50018028) AND grade > '' AND scor
tome_warn_threshold)

cqlsh:resto_ny> 

```

Figure 8: Non-null grades for inspections with score > 30

## Overview

1152 rows contain a non-null grade and a score above 30. The query triggers warnings due to large scans and tombstones.

## 9. Counting Rows from Previous Query

### Query

```

SELECT count(*)
FROM Inspection

```

```
WHERE score > 30 AND grade > ''
ALLOW FILTERING;
```

## Screenshot

```
cqlsh:resto_ny> SELECT count(*)
...   FROM Inspection
... WHERE score > 30 AND grade > ''
... ALLOW FILTERING;

count
-----
1152

(1 rows)

Warnings :
Aggregation query used without partition key

Read 14602 live rows and 10199 tombstone cells for query SELECT grade, score FROM resto_ny.inspection WHERE grade > ''
AND score > 30 LIMIT 100 ALLOW FILTERING; token -7442997124414533764 (see tombstone_warn_threshold)

Read 10005 live rows and 7051 tombstone cells for query SELECT grade, score FROM resto_ny.inspection WHERE token(idrest
aurant) >= token(50002064) AND grade > '' AND score > 30 LIMIT 100 ALLOW FILTERING; token -6193059013504794762 (see tom
bstone_warn_threshold)

Read 13200 live rows and 9243 tombstone cells for query SELECT grade, score FROM resto_ny.inspection WHERE token(idrest
aurant) >= token(41704239) AND grade > '' AND score > 30 LIMIT 100 ALLOW FILTERING; token -4550702397532057402 (see tom
bstone_warn_threshold)

Read 12041 live rows and 8231 tombstone cells for query SELECT grade, score FROM resto_ny.inspection WHERE token(idrest
aurant) >= token(50016323) AND grade > '' AND score > 30 LIMIT 100 ALLOW FILTERING; token -3029533549437488064 (see tom
bstone_warn_threshold)

Read 11255 live rows and 7877 tombstone cells for query SELECT grade, score FROM resto_ny.inspection WHERE token(idrest
```

Figure 9: Counting matching rows (1152 total)

## Overview

The count confirms that **1152 inspections** match the criteria.

## Conclusion

This TP demonstrated the use of Cassandra for large-scale storage: creating a keyspace, generating tables, importing CSV data, and performing CQL queries. Some queries required indexes or **ALLOW FILTERING** due to Cassandra's distributed nature.