

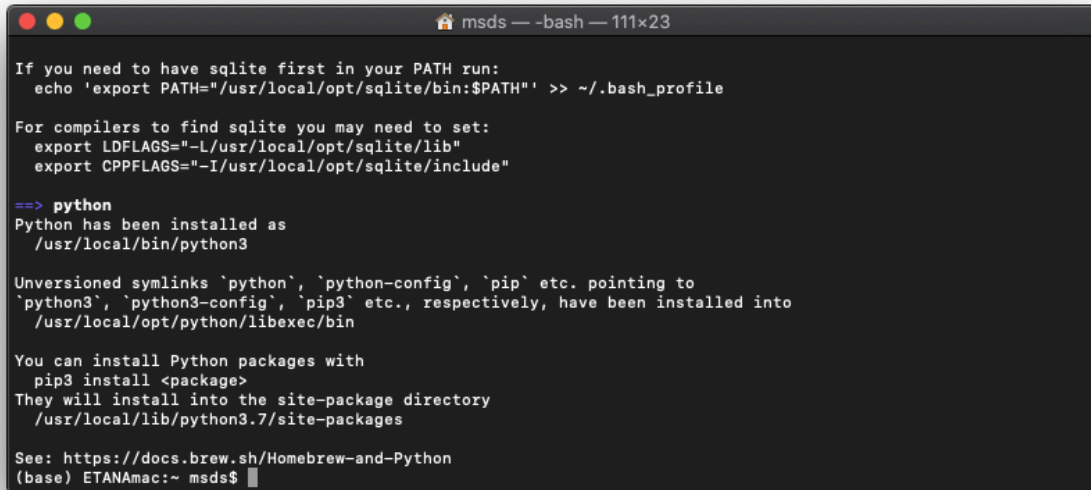
MSDE 631: Lab 6—Cassandra NoSQL Database

Etana Disasa

Installing CASANDRA on Mac OS X

Installing Python first

```
brew install python
```



```
msds — -bash — 111x23

If you need to have sqlite first in your PATH run:
echo 'export PATH="/usr/local/opt/sqlite/bin:$PATH"' >> ~/.bash_profile

For compilers to find sqlite you may need to set:
export LDFLAGS="-L/usr/local/opt/sqlite/lib"
export CPPFLAGS="-I/usr/local/opt/sqlite/include"

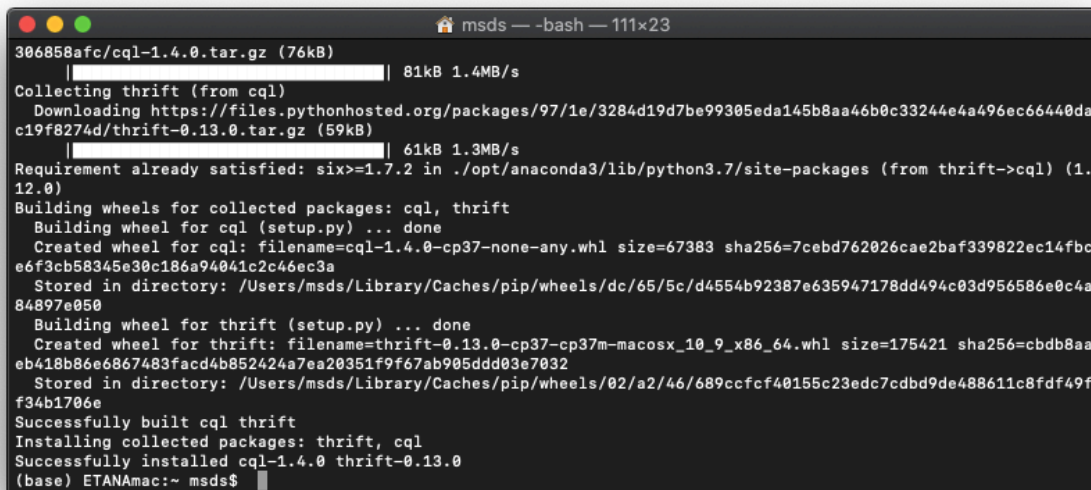
==> python
Python has been installed as
  /usr/local/bin/python3

Unversioned symlinks 'python', 'python-config', 'pip' etc. pointing to
'python3', 'python3-config', 'pip3' etc., respectively, have been installed into
  /usr/local/opt/python/libexec/bin

You can install Python packages with
  pip3 install <package>
They will install into the site-package directory
  /usr/local/lib/python3.7/site-packages

See: https://docs.brew.sh/Homebrew-and-Python
(base) ETANAmac:~ msds$
```

Installing cql



```
msds — -bash — 111x23
306858afc/cql-1.4.0.tar.gz (76kB)
| 81kB 1.4MB/s
Collecting thrift (from cql)
  Downloading https://files.pythonhosted.org/packages/97/1e/3284d19d7be99305eda145b8aa46b0c33244e4a496ec66440da
c19f8274d/thrift-0.13.0.tar.gz (59kB)
| 61kB 1.3MB/s
Requirement already satisfied: six>=1.7.2 in ./opt/anaconda3/lib/python3.7/site-packages (from thrift->cql) (1.
12.0)
Building wheels for collected packages: cql, thrift
  Building wheel for cql (setup.py) ... done
    Created wheel for cql: filename=cql-1.4.0-cp37-none-any.whl size=67383 sha256=7cebd762026cae2baf339822ec14fbc
e6f3cb58345e30c186a94041c2c46ec3a
    Stored in directory: /Users/msds/Library/Caches/pip/wheels/dc/65/5c/d4554b92387e635947178dd494c03d956586e0c4a
84897e050
  Building wheel for thrift (setup.py) ... done
    Created wheel for thrift: filename=thrift-0.13.0-cp37-cp37m-macosx_10_9_x86_64.whl size=175421 sha256=cdbb8aa
eb418b86e6867483facd4b852424a7ea20351f9f67ab905ddd03e7032
    Stored in directory: /Users/msds/Library/Caches/pip/wheels/02/a2/46/689ccfcf40155c23edc7cbbd9de488611c8fdf49f
f34b1706e
Successfully built cql thrift
Installing collected packages: thrift, cql
Successfully installed cql-1.4.0 thrift-0.13.0
(base) ETANAmac:~ msds$
```

Install Cassandra

```
brew install Cassandra
```

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```
msds — -bash — 111x13
(base) ETANAmac:~ msds$ brew install cassandra
=> Downloading https://homebrew.bintray.com/bottles/cassandra-3.11.6_2.catalina.bottle.tar.gz
=> Downloading from https://akamai.bintray.com/87/8793318a2a51b4a285292135b40de6431a8e21557a18b228af6f744a02d8
##### 100.0%
=> Pouring cassandra-3.11.6_2.catalina.bottle.tar.gz
=> Caveats
To have launchd start cassandra now and restart at login:
  brew services start cassandra
Or, if you don't want/need a background service you can just run:
  cassandra -f
=> Summary
📦 /usr/local/Cellar/cassandra/3.11.6_2: 5,781 files, 138.3MB
(base) ETANAmac:~ msds$
```

Cassandra requires Java 8
brew cask install java

```
msds — -bash — 111x13
Receiving objects: 100% (434870/434870), 195.48 MiB | 7.39 MiB/s, done.
Resolving deltas: 100% (307768/307768), done.
Tapped 1 command and 3537 casks (3,653 files, 209.8MB).
=> Downloading https://download.java.net/java/GA/jdk14.0.1/664493ef4a6946b186ff29eb326336a2/7/GPL/openjdk-14.0
##### 100.0%
=> Verifying SHA-256 checksum for Cask 'java'.
=> Installing Cask java
=> Moving Generic Artifact 'jdk-14.0.1.jdk' to '/Library/Java/JavaVirtualMachines/openjdk-14.0.1.jdk'.
Password:
Sorry, try again.
Password:
📦 java was successfully installed!
(base) ETANAmac:~ msds$
```

1. Start Cassandra
cassandra -f

```
cassandra — java -Xloggc:/usr/local/Cellar/cassandra/3.11.6_2/libexec/logs/gc.log -ea -XX:+UseThreadPriorities -XX:ThreadPriorityPolicy=42 -XX:...
INFO [MigrationStage:1] 2020-05-02 00:07:16,411 ViewManager.java:137 - Not submitting build tasks for views in keyspace system_distribut
ed as storage service is not initialized
INFO [MigrationStage:1] 2020-05-02 00:07:16,417 ColumnFamilyStore.java:427 - Initializing system_distributed.parent_repair_history
INFO [MigrationStage:1] 2020-05-02 00:07:16,428 ColumnFamilyStore.java:427 - Initializing system_distributed.repair_history
INFO [MigrationStage:1] 2020-05-02 00:07:16,442 ColumnFamilyStore.java:427 - Initializing system_distributed.view_build_status
INFO [MigrationStage:1] 2020-05-02 00:07:16,447 ViewManager.java:137 - Not submitting build tasks for views in keyspace system_auth as s
torage service is not initialized
INFO [MigrationStage:1] 2020-05-02 00:07:16,454 ColumnFamilyStore.java:427 - Initializing system_auth.resource_role_permissions_index
INFO [MigrationStage:1] 2020-05-02 00:07:16,461 ColumnFamilyStore.java:427 - Initializing system_auth.role_members
INFO [MigrationStage:1] 2020-05-02 00:07:16,469 ColumnFamilyStore.java:427 - Initializing system_auth.role_permissions
INFO [MigrationStage:1] 2020-05-02 00:07:16,478 ColumnFamilyStore.java:427 - Initializing system_auth.roles
INFO [main] 2020-05-02 00:07:16,511 StorageService.java:1478 - JOINING: Finish joining ring
INFO [main] 2020-05-02 00:07:17,152 NativeTransportService.java:73 - Netty using Java NIO event loop
INFO [main] 2020-05-02 00:07:17,283 Server.java:158 - Using Netty Version: [netty-buffer=netty-buffer-4.0.44.Final.452812a, netty-codec=
netty-codec-4.0.44.Final.452812a, netty-codec-haproxy=netty-codec-haproxy-4.0.44.Final.452812a, netty-codec-http=netty-codec-http-4.0.44.
Final.452812a, netty-codec-socks=netty-codec-socks-4.0.44.Final.452812a, netty-common=netty-common-4.0.44.Final.452812a, netty-handler=ne
tty-handler-4.0.44.Final.452812a, netty-tcnative=netty-tcnative-1.1.33.Fork26.142ecbb, netty-transport=netty-transport-4.0.44.Final.45281
2a, netty-transport-native-epoll=netty-transport-native-epoll-4.0.44.Final.452812a, netty-transport-rxtx=netty-transport-rxtx-4.0.44.Fina
l.452812a, netty-transport-sctp=netty-transport-sctp-4.0.44.Final.452812a, netty-transport-udt=netty-transport-udt-4.0.44.Final.452812a]
INFO [main] 2020-05-02 00:07:17,283 Server.java:159 - Starting listening for CQL clients on /127.0.0.1:9042 (unencrypted)...
INFO [main] 2020-05-02 00:07:17,377 CassandraDaemon.java:556 - Not starting RPC server as requested. Use JMX (StorageService->startRPCSe
rver()) or nodetool (enablethrift) to start it
INFO [OptionalTasks:1] 2020-05-02 00:07:26,859 CassandraRoleManager.java:372 - Created default superuser role 'cassandra'
```

2. Start the Cassandra Query Language Shell
cqlsh

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```
msds — cqlsh.py — 159x5
ETANAmac:~ msds$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.11.6 | CQL spec 3.4.4 | Native protocol v4]
Use HELP for help.
cqlsh>
```

3. The Help Command

help

```
msds — cqlsh.py — 159x28
[cqlsh> HELP

Documented shell commands:
=====
CAPTURE  CLS      COPY  DESCRIBE  EXPAND  LOGIN  SERIAL  SOURCE  UNICODE
CLEAR    CONSISTENCY  DESC  EXIT      HELP    PAGING  SHOW    TRACING

CQL help topics:
=====
AGGREGATES          CREATE_KEYSPACE      DROP_TRIGGER         TEXT
ALTER_KEYSPACE      CREATE_MATERIALIZED_VIEW  DROP_TYPE            TIME
ALTER_MATERIALIZED_VIEW  CREATE_ROLE          DROP_USER            TIMESTAMP
ALTER_TABLE          CREATE_TABLE          FUNCTIONS            TRUNCATE
ALTER_TYPE            CREATE_TRIGGER        GRANT                TYPES
ALTER_USER            CREATE_TYPE           INSERT               UPDATE
APPLY                 CREATE_USER           INSERT_JSON          USE
ASCII                 DATE                  INT                  UUID
BATCH                 DELETE                JSON
BEGIN                 DROPAggregate        KEYWORDS
BLOB                  DROP_COLUMNFAMILY    LIST_PERMISSIONS
BOOLEAN               DROP_FUNCTION         LIST_ROLES
COUNTER               DROP_INDEX            LIST_USERS
CREATEAggregate        DROP_KEYSPACE          PERMISSIONS
CREATE_COLUMNFAMILY    DROP_MATERIALIZED_VIEW  REVOKE
CREATE_FUNCTION         DROP_ROLE             SELECT
CREATE_INDEX           DROP_TABLE             SELECT_JSON

cqlsh>
```

Question: What is the name of the sample table used in the help documentation displayed?

Answer: *I did not understand the question because I didn't use Oracle VM to complete this assignment.*

N.B: Recent CQLSH help option such as <HELP INSERT> opts to open up a browser to open a corresponding help website. In this case, the link was old and broken.

4. Provide a screenshot of your CQL session to show your new keyspace and table:

```
msds — cqlsh.py — 141x28
cqlsh:etana> create table wiki (
[...
... ID int,
... mytext text,
... primary key (ID));
cqlsh:etana> DESC SCHEMA;

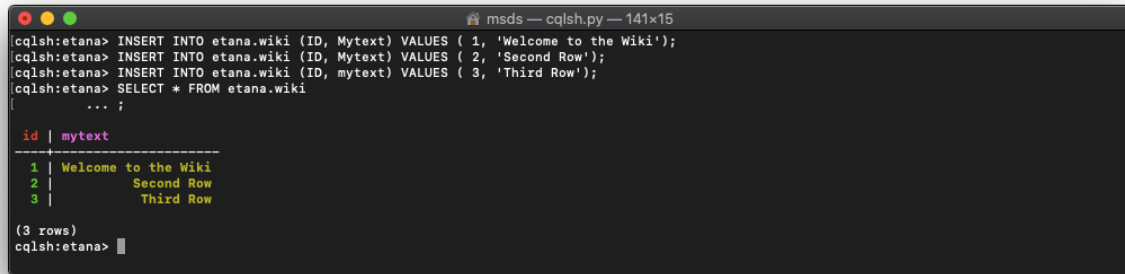
CREATE KEYSPACE etana WITH replication = {'class': 'SimpleStrategy', 'replication_factor': '1'} AND durable_writes = true;

CREATE TABLE etana.wiki (
  id int PRIMARY KEY,
  mytext text
) WITH bloom_filter_fp_chance = 0.01
AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
AND comment = ''
AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
AND compression = {'chunk_length_in_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
AND crc_check_chance = 1.0
AND dclocal_read_repair_chance = 0.1
AND default_time_to_live = 0
AND gc_grace_seconds = 864000
AND max_index_interval = 2048
AND memtable_flush_period_in_ms = 0
AND min_index_interval = 128
AND read_repair_chance = 0.0
AND speculative_retry = '99PERCENTILE';

cqlsh:etana>
```

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5. Verifying the data inserted
`SELECT * FROM etana.wiki`

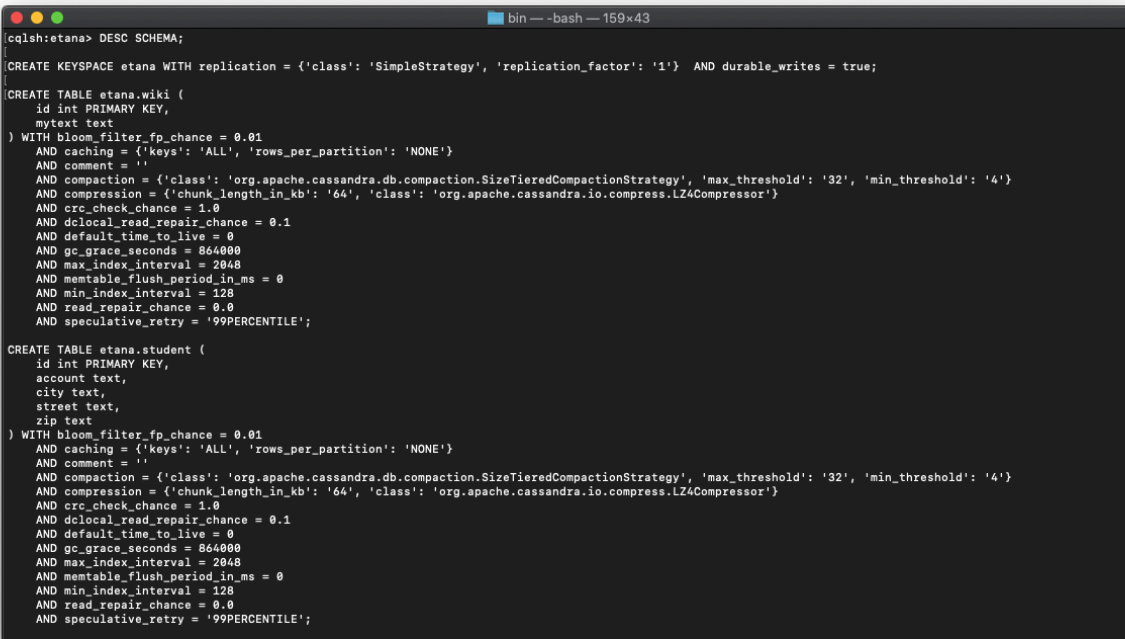


```
msds — cqlsh.py — 141x15
cqlsh:etana> INSERT INTO etana.wiki (ID, Mytext) VALUES ( 1, 'Welcome to the Wiki');
cqlsh:etana> INSERT INTO etana.wiki (ID, Mytext) VALUES ( 2, 'Second Row');
cqlsh:etana> INSERT INTO etana.wiki (ID, mytext) VALUES ( 3, 'Third Row');
cqlsh:etana> SELECT * FROM etana.wiki
... ;

id | mytext
---|-----
1  | Welcome to the Wiki
2  | Second Row
3  | Third Row
(3 rows)
cqlsh:etana>
```

6. **Question:** Describe the schema again and then provide a screenshot of your CQL session to show your revised table structures:

Answer: *The schema has a keyspace (etana) with two table (student and wiki) in it. Each table has its columns. The wiki table has ID and mytext as columns; and student has ID, account, city, street and zip as its variables.*



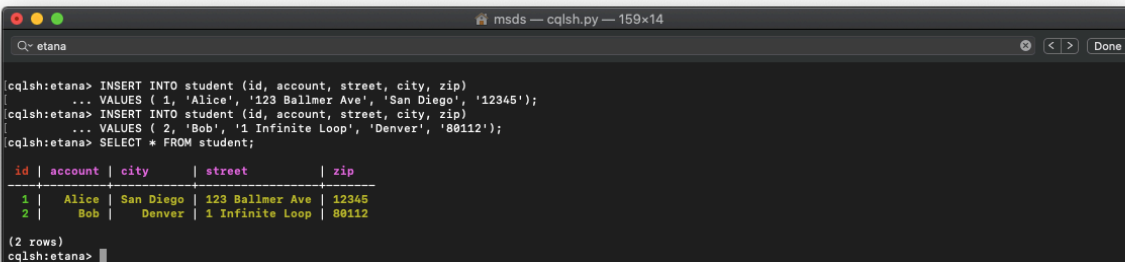
```
bin — -bash — 159x43
cqlsh:etana> DESC SCHEMA;

CREATE KEYSPACE etana WITH replication = {'class': 'SimpleStrategy', 'replication_factor': '1'} AND durable_writes = true;

CREATE TABLE etana.wiki (
  id int PRIMARY KEY,
  mytext text
) WITH bloom_filter_fp_chance = 0.01
AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
AND comment = ''
AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
AND compression = {'chunk_length_in_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
AND crc_check_chance = 1.0
AND dclocal_read_repair_chance = 0.1
AND default_time_to_live = 0
AND gc_grace_seconds = 864000
AND max_index_interval = 2048
AND memtable_flush_period_in_ms = 0
AND min_index_interval = 128
AND read_repair_chance = 0.0
AND speculative_retry = '99PERCENTILE';

CREATE TABLE etana.student (
  id int PRIMARY KEY,
  account text,
  city text,
  street text,
  zip text
) WITH bloom_filter_fp_chance = 0.01
AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
AND comment = ''
AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
AND compression = {'chunk_length_in_kb': '64', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
AND crc_check_chance = 1.0
AND dclocal_read_repair_chance = 0.1
AND default_time_to_live = 0
AND gc_grace_seconds = 864000
AND max_index_interval = 2048
AND memtable_flush_period_in_ms = 0
AND min_index_interval = 128
AND read_repair_chance = 0.0
AND speculative_retry = '99PERCENTILE';
```

7. Inserting data into the table



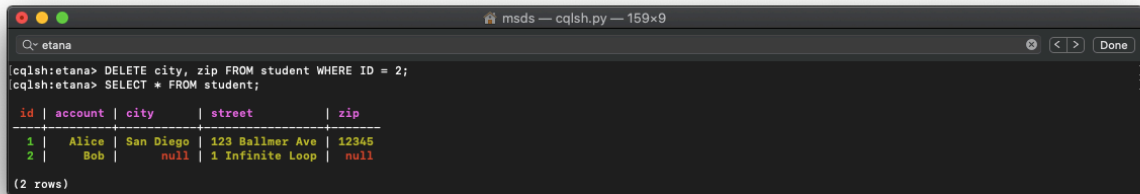
```
msds — cqlsh.py — 159x14
cqlsh:etana> INSERT INTO student (id, account, street, city, zip)
... VALUES ( 1, 'Alice', '123 Ballmer Ave', 'San Diego', '12345');
cqlsh:etana> INSERT INTO student (id, account, street, city, zip)
... VALUES ( 2, 'Bob', '1 Infinite Loop', 'Denver', '80112');
cqlsh:etana> SELECT * FROM student;

id | account | city | street | zip
---|-----|----|-----|---
1  | Alice   | San Diego | 123 Ballmer Ave | 12345
2  | Bob     | Denver | 1 Infinite Loop | 80112
(2 rows)
cqlsh:etana>
```

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Deleting data from the table

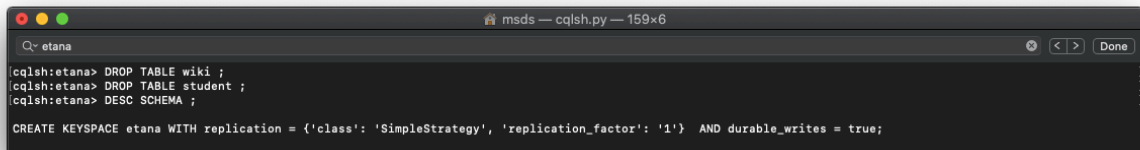


```
msds — cqlsh.py — 159x9
cqlsh:etana
[cqlsh:etana> DELETE city, zip FROM student WHERE ID = 2;
[cqlsh:etana> SELECT * FROM student;

id | account | city      | street      | zip
---|---|---|---|---
1  | Alice   | San Diego | 123 Ballmer Ave | 12345
2  | Bob     | null      | 1 Infinite Loop | null

(2 rows)
```

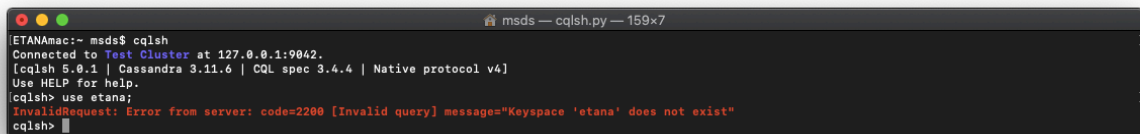
Deleting schema



```
msds — cqlsh.py — 159x6
cqlsh:etana
[cqlsh:etana> DROP TABLE wiki ;
[cqlsh:etana> DROP TABLE student ;
[cqlsh:etana> DESC SCHEMA ;

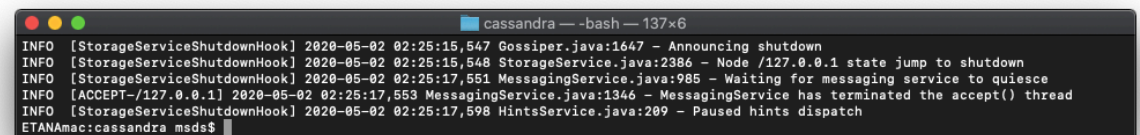
CREATE KEYSPACE etana WITH replication = {'class': 'SimpleStrategy', 'replication_factor': '1'} AND durable_writes = true;
```

7. Provide a screenshot below of your use command to demonstrate you deleted the keyspace:



```
msds — cqlsh.py — 159x7
ETANAmac:~ msds$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.11.6 | CQL spec 3.4.4 | Native protocol v4]
Use HELP for help.
[cqlsh> use etana;
InvalidRequest: Error from server: code=2200 [Invalid query] message="Keyspace 'etana' does not exist"
cqlsh>
```

Stopping cqlsh and Cassandra



```
cassandra — -bash — 137x6
INFO [StorageServiceShutdownHook] 2020-05-02 02:25:15,547 Gossiper.java:1647 - Announcing shutdown
INFO [StorageServiceShutdownHook] 2020-05-02 02:25:15,548 StorageService.java:2386 - Node /127.0.0.1 state jump to shutdown
INFO [StorageServiceShutdownHook] 2020-05-02 02:25:17,551 MessagingService.java:985 - Waiting for messaging service to quiesce
INFO [ACCEPT-/127.0.0.1] 2020-05-02 02:25:17,553 MessagingService.java:1346 - MessagingService has terminated the accept() thread
INFO [StorageServiceShutdownHook] 2020-05-02 02:25:17,598 HintsService.java:209 - Paused hints dispatch
ETANAmac:cassandra msds$
```

End of Assignment