



# **Vidyavardhini's College of Engineering & Technology**

Department of Computer Engineering

Academic Year : 2023-24

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Experiment No. 3
To install and configure Cassandra to execute NOSQL commands
Date of Performance:31/7/2023
Date of Submission:7/8/2023



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Academic Year : 2023-24

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**Aim:** To install and configure MongoDB/ Cassandra/ HBase/ Hypertable and to execute NoSQL commands.

## Theory:

1. Visit the official Oracle download page and download the Oracle JDK 8 software package.





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Department of Computer Engineering

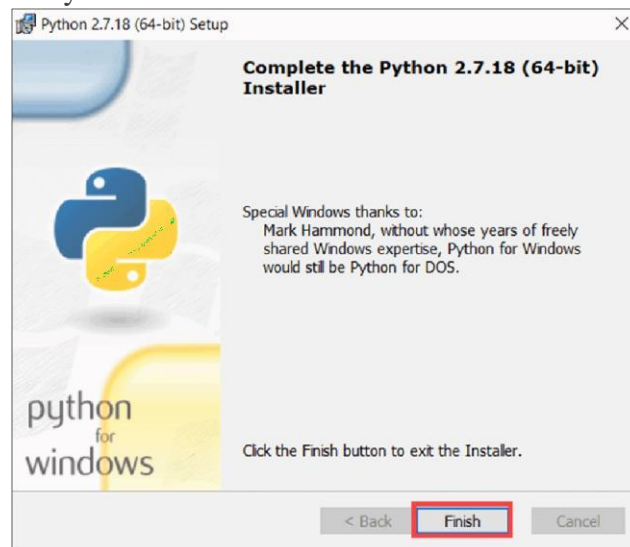
Academic Year : 2023-24

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2. Configure Environment Variables for Java 8. It is vital to configure the environment variables in Windows and define the correct path to the Java 8 installation folder.

-Enter JAVA\_HOME for the new variable name. Select the Variable value field and then the Browse Directory option to navigate up to the jdk folder.

3. Install and Configure Python 2.7 on Windows.



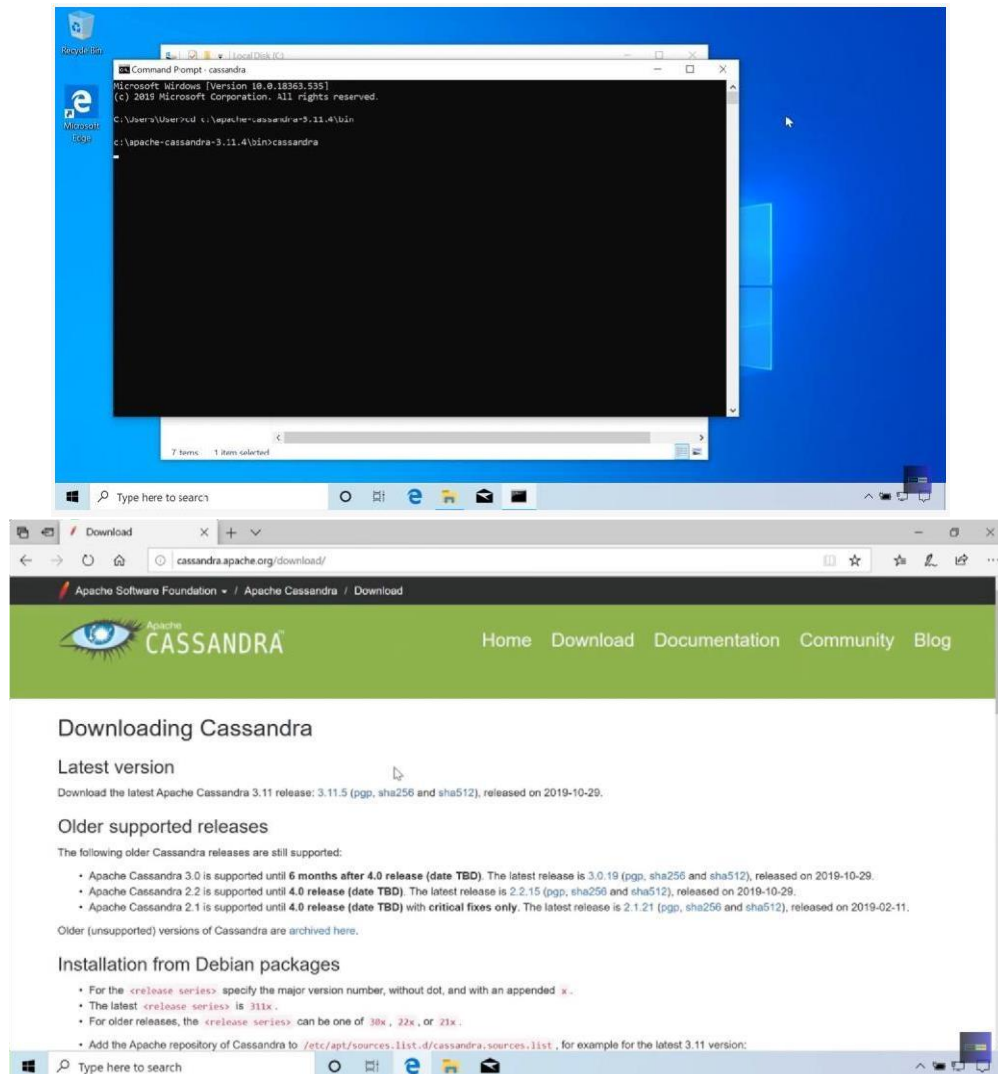
4. Configure Environment Variables for Python 2.7. Add the Python 2.7 path to the Path system variable.
5. Download and Set Up Apache Cassandra, Visit the official [Apache Cassandra Download](#) page and select the version you would prefer to download.



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Department of Computer Engineering

Academic Year : 2023-24



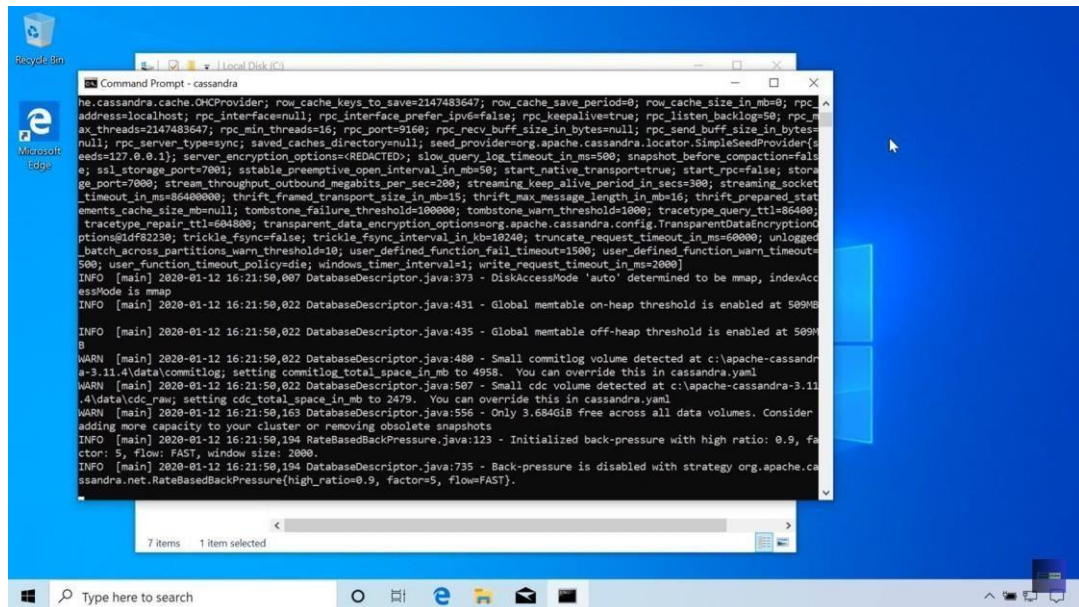
6. Unzip the compressed tar.gz folder using a compression tool like winzip/7zip.
7. Set up the environment variables for Cassandra to enable the database to interact with other applications and operate on Windows.
8. Type CASSANDRA\_HOME for Variable name, then for the Variable value column select the location of the unzipped Apache Cassandra folder.
9. Start Cassandra from Windows CMD.  
Navigate to the Cassandra bin folder. Start the Windows Command Prompt directly from within the bin folder by typing `cmd` in the address bar and pressing Enter.
10. Type the following command to start the Cassandra server: **cassandra**



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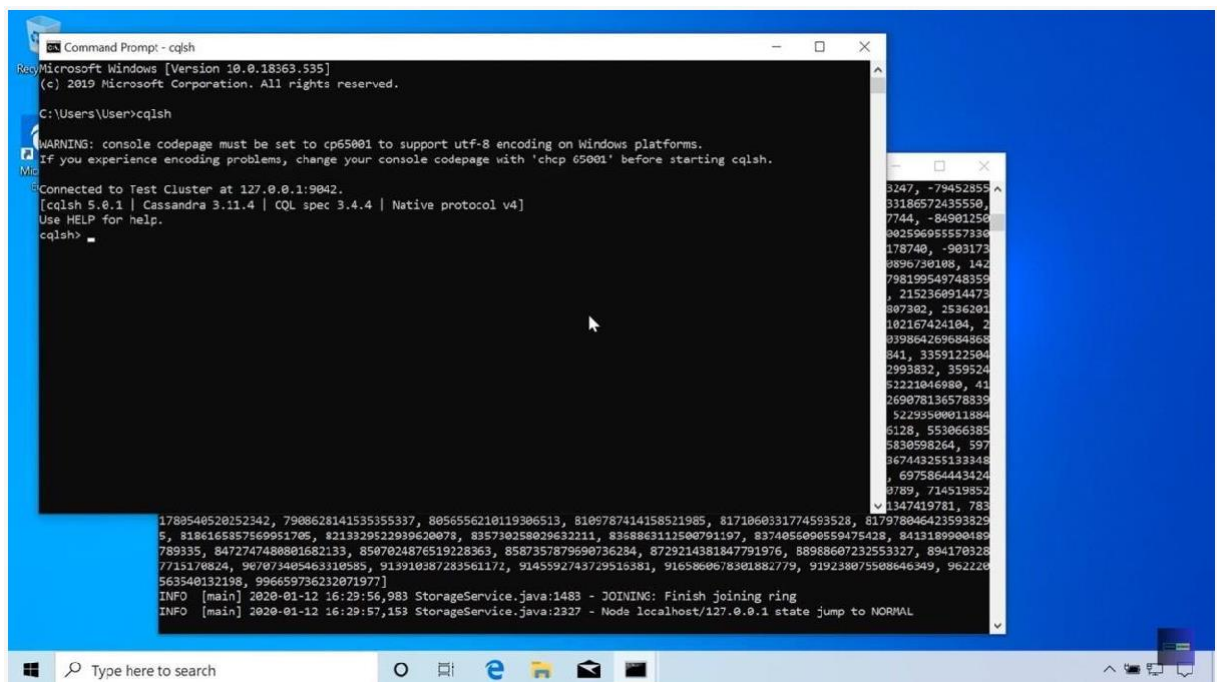
## Department of Computer Engineering

### Academic Year : 2023-24



```
he.cassandra.cache.OCProvider; row_cache_keys_to_save=2147483647; row_cache_save_period=0; row_cache_size_in_mb=0; rpc_address=localhost; rpc_interface=null; rpc_interface_prefer_ipv6=false; rpc_keepalive=true; rpc_listen_backlog=50; rpc_max_threads=2147483647; rpc_min_threads=16; rpc_port=9160; rpc_recv_buff_size_in_bytes=null; rpc_send_buff_size_in_bytes=null; rpc_server_type=sync; saved_caches_directory=null; seed_provider=org.apache.cassandra.locator.SimpleSeedProvider{seeds=127.0.0.1}; server_encryption_options=<REDACTED>; allow_query_log_timeout_in_ms=500; snapshot_before_compactions=false; ssl_storage_port=7001; stable_preemptive_open_interval_in_mb=50; start_native_transport=true; start_rpc=false; storage_port=7000; stream_throughput_outbound_megabits_per_sec=200; streaming_keep_alive_period_in_secs=300; streaming_socket_timeout_in_ms=86400000; thrift_framed_transport_size_in_mb=15; thrift_max_message_length_in_mb=16; thrift_prepared_statements_cache_size_mb=null; tombstone_failure_threshold=10000; tombstone_warn_threshold=1000; tracetype_query_ttl=86400; tracetype_repair_ttl=604800; transparent_data_encryption_options=org.apache.cassandra.config.TransparentDataEncryptionOptions{enabled=false; trickle_fsync=false; trickle_fsync_interval_in_kb=10240; truncate_request_timeout_in_ms=60000; unlogged_batch_across_partitions_warn_threshold=10; user_defined_function_fail_timeout=1500; user_defined_function_warn_timeout=500; user_function_timeout_policy=die; windows_timer_interval=1; write_request_timeout_in_ms=2000}
INFO [main] 2020-01-12 16:21:50,007 DatabaseDescriptor.java:373 - DiskAccessMode 'auto' determined to be mmap, indexAccessMode is mmap
INFO [main] 2020-01-12 16:21:50,022 DatabaseDescriptor.java:431 - Global memtable on-heap threshold is enabled at 509MB
INFO [main] 2020-01-12 16:21:50,022 DatabaseDescriptor.java:435 - Global memtable off-heap threshold is enabled at 509MB
WARN [main] 2020-01-12 16:21:50,022 DatabaseDescriptor.java:480 - Small commitlog volume detected at c:\apache-cassandra-3.11.4\data\commitlog; setting commitlog_total_space_in_mb to 4958. You can override this in cassandra.yaml
WARN [main] 2020-01-12 16:21:50,022 DatabaseDescriptor.java:507 - Small cdc volume detected at c:\apache-cassandra-3.11.4\data\cdc_raw; setting cdc_total_space_in_mb to 2479. You can override this in cassandra.yaml
WARN [main] 2020-01-12 16:21:50,163 DatabaseDescriptor.java:556 - Only 3.684GiB free across all data volumes. Consider adding more capacity to your cluster or removing obsolete snapshots
INFO [main] 2020-01-12 16:21:50,194 RateBasedBackPressure.java:123 - Initialized back-pressure with high ratio: 0.9, factor: 5, flow: FAST, window size: 2000
INFO [main] 2020-01-12 16:21:50,194 DatabaseDescriptor.java:735 - Back-pressure is disabled with strategy org.apache.cassandra.net.RateBasedBackPressure[high_ratio=0.9, factor=5, flow=FAST].
```

11. While the initial command prompt is still running open a new command line prompt from the same bin folder. Enter the following command to access the Cassandra cqlsh bash shell: **cqlsh**



```
Microsoft Windows [Version 10.0.18363.535]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\User>cqlsh

WARNING: console codepage must be set to cp65001 to support utf-8 encoding on Windows platforms.
If you experience encoding problems, change your console codepage with 'chcp 65001' before starting cqlsh.

Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.11.4 | CQL spec 3.4.4 | Native protocol v4]
Use HELP for help.
cqlsh>

178954052052342, 790862814153535537, 8056556210119306513, 8109787414158521985, 8171060331774593528, 81797804642359329
5, 8186165857569951705, 82133295122939620078, 835730258029632211, 8368863112500791197, 8374056090559475428, 84131899000189
789335, 8472747480801682133, 85070248765192128363, 8587357879690736284, 8729214381847791976, 88988607232553327, 894170328
7715170824, 907073405463110585, 913910387283561172, 9145592743729516361, 9165800678301882779, 919238075508646349, 962220
563540132198, 996659736232071977]
INFO [main] 2020-01-12 16:29:56,983 StorageService.java:1483 - JOINING: Finish joining ring
INFO [main] 2020-01-12 16:29:57,153 StorageService.java:2327 - Node localhost/127.0.0.1 state jump to NORMAL
```

Output:





# Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

Academic Year : 2023-24

```
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib...
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ echo $JAVA_HOME

ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ echo $JAVA_HOME

ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo apt install curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (7.81.0-1ubuntu1.13).
The following packages were automatically installed and are no longer required:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
 intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58
 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
 libcodec2-1.0 libdavid5 libflite1 libgme0 libgsm1
 libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libmfx1 libmysofa1
 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2
 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0
 libstrt1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0
 libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1
 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvbi-common libzvbi0
 mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  cassandra-tools
The following NEW packages will be installed:
  cassandra
```



# Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

Academic Year : 2023-24

```
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib...
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC:~$ sudo apt install openjdk-8-jre-headless
[sudo] password for ubuntu:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
 intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58
 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
 libcodec2-1.0 libdav1d5 libflite1 libgme0 libgsm1
 libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libmfx1 libmysofa1
 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2
 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0
 libstrt1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0
 libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1
 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvbi-common libzvbi0
 mesa-va-drivers mesa-va-drivers pocketsphinx-en-us systemd-hwe-hwdb
 va-driver-all vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
 ca-certificates-java java-common
Suggested packages:
 default-jre fonts-dejavu-extra fonts-nanum fonts-ipafont-gothic

Sep 25 12:46:57 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Starting LSB
Sep 25 12:46:57 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Started LSB
lines 1-13/13 (END)
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ nodetool status
Datacenter: datacenter1
=====
Status=Up/Down
||/ State=Normal/Leaving/Joining/Moving
-- Address Load Tokens Owns (effective) Host ID
Rack
UN 127.0.0.1 125.39 KiB 16 100.0% c5c52bbc-441e-419c-99ae-5f5
a156dd90e rack1

ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ python --version
Command 'python' not found, did you mean:
  command 'python3' from deb python3
  command 'python' from deb python-is-python3
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo apt install python-2.7.15
Reading package lists... Done
Building dependency tree... Done
```



# Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

Academic Year : 2023-24

```
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib...
update-rc.d: warning: start and stop actions are no longer supported; falling ba
ck to defaults
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra start
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra status
● cassandra.service - LSB: distributed storage system for structured data
   Loaded: loaded (/etc/init.d/cassandra; generated)
   Active: active (running) since Mon 2023-09-25 12:45:04 IST; 35s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 9155 ExecStart=/etc/init.d/cassandra start (code=exited, status=0/
    Tasks: 61 (limit: 9062)
   Memory: 2.2G
      CPU: 10.665s
   CGroup: /system.slice/cassandra.service
           └─9297 /usr/bin/java -ea -da:net.openhft... -XX:+UseThreadPrioriti>

Sep 25 12:45:04 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Starting LS>
Sep 25 12:45:04 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Started LSB>
lines 1-13/13 (END)
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra stop
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra status

Setting up python2.7-minimal (2.7.18-13ubuntu1.1) ...
Linking and byte-compiling packages for runtime python2.7...
Setting up python2-minimal (2.7.18-3) ...
Selecting previously unselected package python2.
(Reading database ... 210917 files and directories currently installed.)
Preparing to unpack .../python2_2.7.18-3_amd64.deb ...
Unpacking python2 (2.7.18-3) ...
Setting up libpython2.7-stdlib:amd64 (2.7.18-13ubuntu1.1) ...
Setting up python2.7 (2.7.18-13ubuntu1.1) ...
Setting up libpython2-stdlib:amd64 (2.7.18-3) ...
Setting up python2 (2.7.18-3) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ python2 -V
Python 2.7.18
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042
[cqlsh 6.1.0 | Cassandra 4.1.3 | CQL spec 3.4.6 | Native protocol v5]
Use HELP for help.
cqlsh>
```





# Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

Academic Year : 2023-24

```
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib...
$ sudo service cassandra stop
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra status
○cassandra.service - LSB: distributed storage system for structured data
   Loaded: loaded (/etc/init.d/cassandra; generated)
   Active: inactive (dead) since Mon 2023-09-25 12:46:16 IST; 14s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 9155 ExecStart=/etc/init.d/cassandra start (code=exited, status=0/>>
  Process: 9651 ExecStop=/etc/init.d/cassandra stop (code=exited, status=0/SU>
    CPU: 12.167s

Sep 25 12:45:04 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Starting LS>
Sep 25 12:45:04 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Started LSB>
Sep 25 12:46:12 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Stopping LS>
Sep 25 12:46:16 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: cassandra.s>
Sep 25 12:46:16 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: Stopped LSB>
Sep 25 12:46:16 ubuntu-HP-Elite-Tower-600-G9-Desktop-PC systemd[1]: cassandra.s>

ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra start
ubuntu@ubuntu-HP-Elite-Tower-600-G9-Desktop-PC: /usr/lib/jvm/java-8-openjdk-amd64
$ sudo service cassandra status
●cassandra.service - LSB: distributed storage system for structured data
   Loaded: loaded (/etc/init.d/cassandra; generated)
```

## Conclusion:

Installing and configuring Cassandra provides a powerful environment for executing NoSQL commands. With its distributed architecture and flexibility, Cassandra is well-suited for handling large volumes of data and is a valuable tool for various data storage and retrieval needs. Proper setup and configuration are essential to leverage its capabilities effectively.