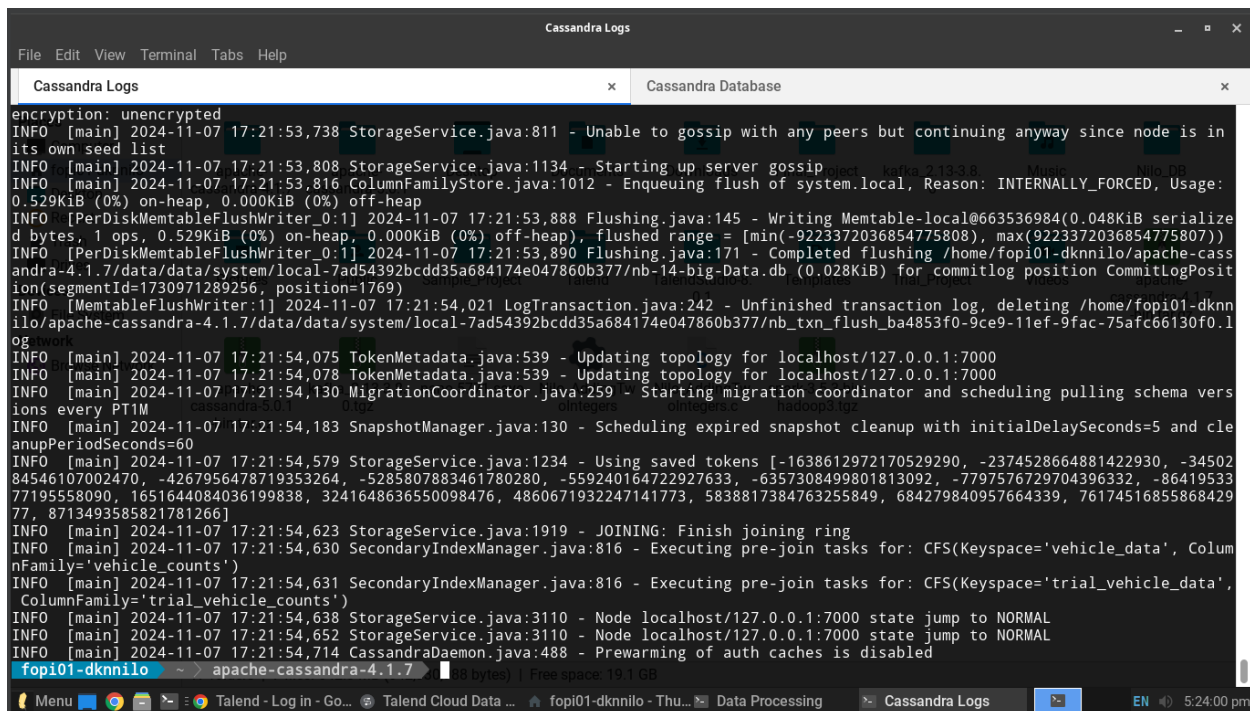


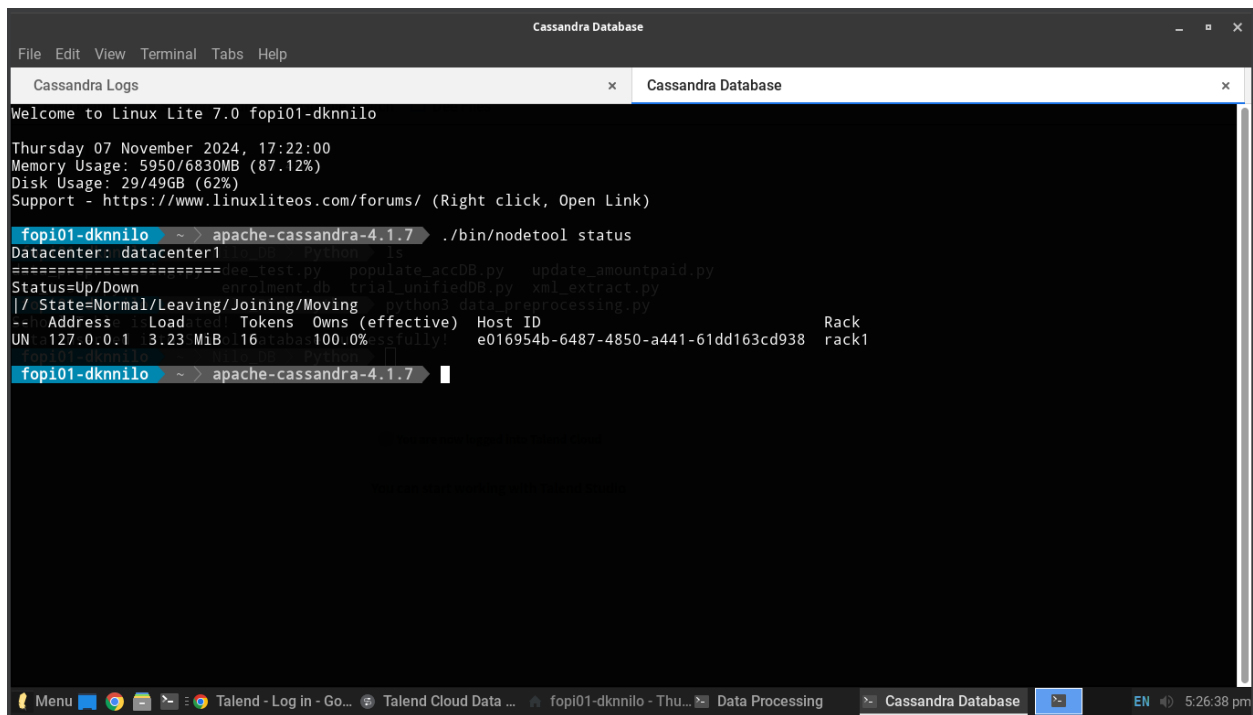
---

M2-SA1: Cassandra to Excel File Migration Process using Talend**CASSANDRA STATUS CHECK**

The first thing we did is to determine the status of Cassandra logs by navigating into the `apache-cassandra-4.1.7` directory. Inside the directory, we typed the commands, `tail -f logs/system.log` and `./bin/nodetool status` to check the connection availability. Doing this will determine whether the Cassandra is down, and if it is possible to read, write and update data inside the database.



```
encryption: unencrypted
INFO [main] 2024-11-07 17:21:53,738 StorageService.java:811 - Unable to gossip with any peers but continuing anyway since node is in
its own seed list
INFO [main] 2024-11-07 17:21:53,808 StorageService.java:1134 - Starting up server gossip
INFO [main] 2024-11-07 17:21:53,816 ColumnFamilyStore.java:1012 - Enqueuing flush of system.local, Reason: INTERNALLY_FORCED, Usage:
0.529KiB (0%) on-heap, 0.000KiB (0%) off-heap
INFO [PerDiskMemtableFlushWriter_0:1] 2024-11-07 17:21:53,888 Flushing.java:145 - Writing Memtable-local@663536984(0.048KiB serialize
d bytes, 1 ops, 0.529KiB (0%) on-heap, 0.000KiB (0%) off-heap), flushed range = [min(-9223372036854775808), max(9223372036854775807))
INFO [PerDiskMemtableFlushWriter_0:1] 2024-11-07 17:21:53,890 Flushing.java:171 - Completed flushing /home/fopi01-dknnilo/apache-cass
andra-4.1.7/data/data/system/local-7ad54392bcd35a684174e047860b377/nb-14-big-Data.db (0.028KiB) for commitlog position CommitLogPosit
ion(segmentId=1730971289256, position=1769)
INFO [MemtableFlushWriter:1] 2024-11-07 17:21:54,021 LogTransaction.java:242 - Unfinished transaction log, deleting /home/fopi01-dknn
ilo/apache-cassandra-4.1.7/data/data/system/local-7ad54392bcd35a684174e047860b377/nb_txn_flush_ba4853f0-9ce9-11ef-9fac-75afc66130f0.1
og
INFO [main] 2024-11-07 17:21:54,075 TokenMetadata.java:539 - Updating topology for localhost/127.0.0.1:7000
INFO [main] 2024-11-07 17:21:54,078 TokenMetadata.java:539 - Updating topology for localhost/127.0.0.1:7000
INFO [main] 2024-11-07 17:21:54,130 MigrationCoordinator.java:259 - Starting migration coordinator and scheduling pulling schema vers
ions every PT1M
INFO [main] 2024-11-07 17:21:54,183 SnapshotManager.java:130 - Scheduling expired snapshot cleanup with initialDelaySeconds=5 and cle
anupPeriodSeconds=60
INFO [main] 2024-11-07 17:21:54,579 StorageService.java:1234 - Using saved tokens [-1638612972170529290, -2374528664881422930, -34502
84546107002470, -4267956478719353264, -5285807883461780280, -559240164722927633, -6357308499801813092, -7797576729704396332, -86419533
7719558090, 1651644084036199838, 3241648636550098476, 4860671932247141773, 5838817384763255849, 684279840957664339, 76174516855868429
77, 8713493585821781266]
INFO [main] 2024-11-07 17:21:54,623 StorageService.java:1919 - JOINING: Finish joining ring
INFO [main] 2024-11-07 17:21:54,630 SecondaryIndexManager.java:816 - Executing pre-join tasks for: CFS(Keyspace='vehicle_data', Colum
nFamily='vehicle_counts')
INFO [main] 2024-11-07 17:21:54,631 SecondaryIndexManager.java:816 - Executing pre-join tasks for: CFS(Keyspace='trial_vehicle_data',
ColumnFamily='trial_vehicle_counts')
INFO [main] 2024-11-07 17:21:54,638 StorageService.java:3110 - Node localhost/127.0.0.1:7000 state jump to NORMAL
INFO [main] 2024-11-07 17:21:54,652 StorageService.java:3110 - Node localhost/127.0.0.1:7000 state jump to NORMAL
INFO [main] 2024-11-07 17:21:54,714 CassandraDaemon.java:488 - Prewarming of auth caches is disabled
fopi01-dknnilo ~ > apache-cassandra-4.1.7 > 20 (68 bytes) | Free space: 19.1 GB
```



```
Cassandra Database
File Edit View Terminal Tabs Help
Cassandra Logs x Cassandra Database x
Welcome to Linux Lite 7.0 fopi01-dknnilo
Thursday 07 November 2024, 17:22:00
Memory Usage: 5950/6830MB (87.12%)
Disk Usage: 29/49GB (62%)
Support - https://www.linuxliteos.com/forums/ (Right click, Open Link)
fopi01-dknnilo ~ > apache-cassandra-4.1.7 ./bin/nodetool status
Datacenter: datacenter1
=====
Status=Up/Down
-- Address -- Load -- Tokens -- Owns (effective) -- Host ID -- Rack
UN 127.0.0.1 3.23 MiB 16 100.0% e016954b-6487-4850-a441-61dd163cd938 rack1
fopi01-dknnilo ~ > apache-cassandra-4.1.7
```

## ACCESSING CASSANDRA DATABASE

After checking the connection, we access the Cassandra database by using the command `./bin/cqlsh`. We checked if the `vehicle_data` keyspace is present in the Cassandra database using the command `DESCRIBE KEYSPACE`. We also checked the information of the `vehicle_counts` table by using the command `DESCRIBE TABLE vehicle_data.vehicle_counts`. Then, we display the first 10 entries of the table using the commands `SELECT timeuuid_id, lgu_code, sensor_id, date_saved, time_saved, total FROM vehicle_data.vehicle_counts LIMIT 10`; to display the first 6 columns of the table and `SELECT car, bus, truck, jeepney, bike, tryke, others FROM vehicle_data.vehicle_counts LIMIT 10`; to display the specific counts of vehicles based on their categories.



```
Cassandra Database
File Edit View Terminal Tabs Help

Cassandra Logs x Cassandra Database x

CREATE TABLE vehicle_data.vehicle_counts (
  timeuuid_id uuid PRIMARY KEY,
  bike int,
  bus int,
  car int,
  date_saved text,
  jeepney int,
  lgu_code text,
  others int,
  sensor_id text,
  time_saved text,
  total int,
  truck int,
  tryke int
) WITH additional_write_policy = '99p'
  AND bloom_filter_fp_chance = 0.01
  AND caching = {'keys': 'ALL', 'rows_per_partition': 'NONE'}
  AND cdc = false
  AND comment = ''
  AND compaction = {'class': 'org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy', 'max_threshold': '32', 'min_threshold': '4'}
  AND compression = {'chunk_length_in_kb': '16', 'class': 'org.apache.cassandra.io.compress.LZ4Compressor'}
  AND memtable = 'default'
  AND crc_check_chance = 1.0
  AND default_time_to_live = 0
  AND extensions = {}
  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 = 'BLOCKING'
  AND speculative_retry = '99p';
cqlsh:vehicle_data>
```

```
Cassandra Database
File Edit View Terminal Tabs Help

Cassandra Logs x Cassandra Database x

cqlsh:vehicle_data> SELECT timeuuid_id, lgu_code, sensor_id, date_saved, time_saved, total FROM vehicle_data.vehicle_counts LIMIT 10;

timeuuid_id | lgu_code | sensor_id | date_saved | time_saved | total
-----
e3ee4103-9aae-11ef-97be-0800271dd214 | 1200 | sensor_05 | 11042024 | 21:15:42 | 16
a5ec5258-9ab2-11ef-97be-0800271dd214 | 1200 | sensor_07 | 11042024 | 21:42:36 | 12
a5a5908d-9ab1-11ef-97be-0800271dd214 | 1200 | sensor_09 | 11042024 | 21:35:25 | 9
cf0ca99a-9ab0-11ef-97be-0800271dd214 | 1200 | sensor_10 | 11042024 | 21:29:25 | 12
59569fc9-9ab5-11ef-97be-0800271dd214 | 1200 | sensor_08 | 11042024 | 22:01:55 | 13
1e09b6c6-9ab2-11ef-97be-0800271dd214 | 1200 | sensor_04 | 11042024 | 21:38:48 | 13
d7fd1012-9aae-11ef-97be-0800271dd214 | 1200 | sensor_05 | 11042024 | 21:15:21 | 7
100c82aa-9ab3-11ef-97be-0800271dd214 | 1200 | sensor_06 | 11042024 | 21:45:33 | 7
2cfa4fe3-9ab0-11ef-97be-0800271dd214 | 1200 | sensor_03 | 11042024 | 21:24:54 | 7
7a328f97-9ab3-11ef-97be-0800271dd214 | 1200 | sensor_04 | 11042024 | 21:48:31 | 9

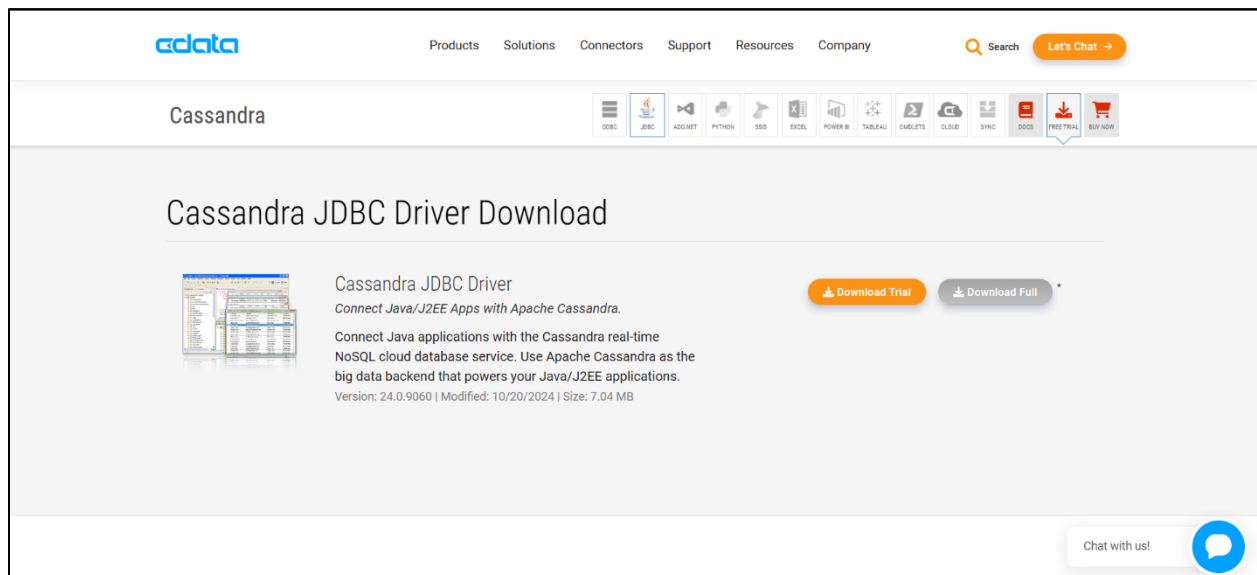
(10 rows)
cqlsh:vehicle_data> SELECT car, bus, truck, jeepney, bike, tryke, others FROM vehicle_data.vehicle_counts LIMIT 10;

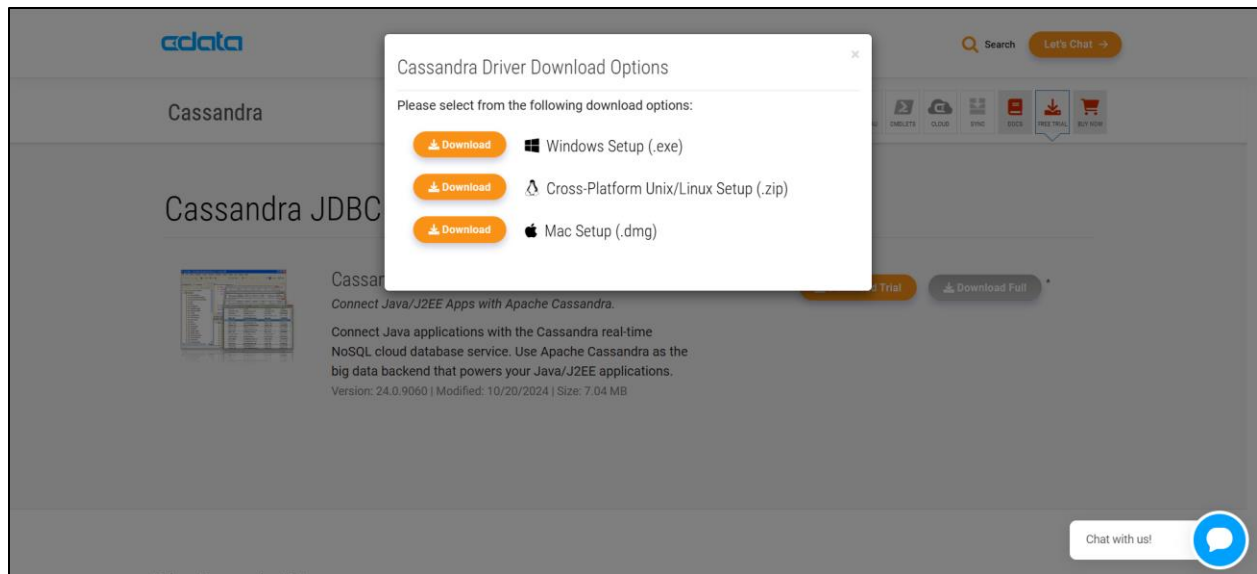
car | bus | truck | jeepney | bike | tryke | others
-----
1 | 2 | 2 | 2 | 5 | 2 | 2
1 | 2 | 2 | 1 | 1 | 3 | 2
1 | 0 | 1 | 2 | 3 | 2 | 0
4 | 0 | 2 | 1 | 0 | 3 | 2
1 | 1 | 0 | 1 | 5 | 3 | 2
2 | 2 | 2 | 1 | 4 | 2 | 0
0 | 1 | 1 | 0 | 0 | 3 | 2
4 | 0 | 0 | 2 | 1 | 0 | 0
2 | 0 | 1 | 0 | 3 | 0 | 1
1 | 1 | 2 | 2 | 1 | 0 | 2

(10 rows)
cqlsh:vehicle_data>
```

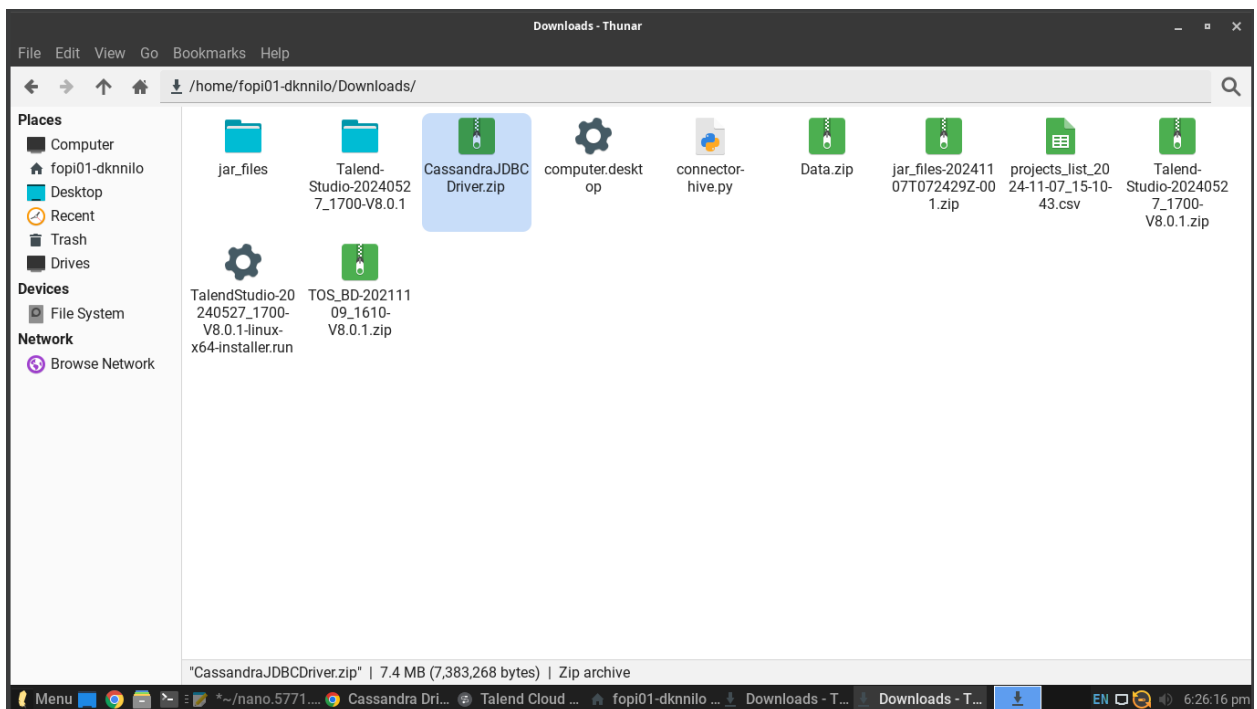
## DOWNLOADING AND INSTALLING JDBC DRIVER

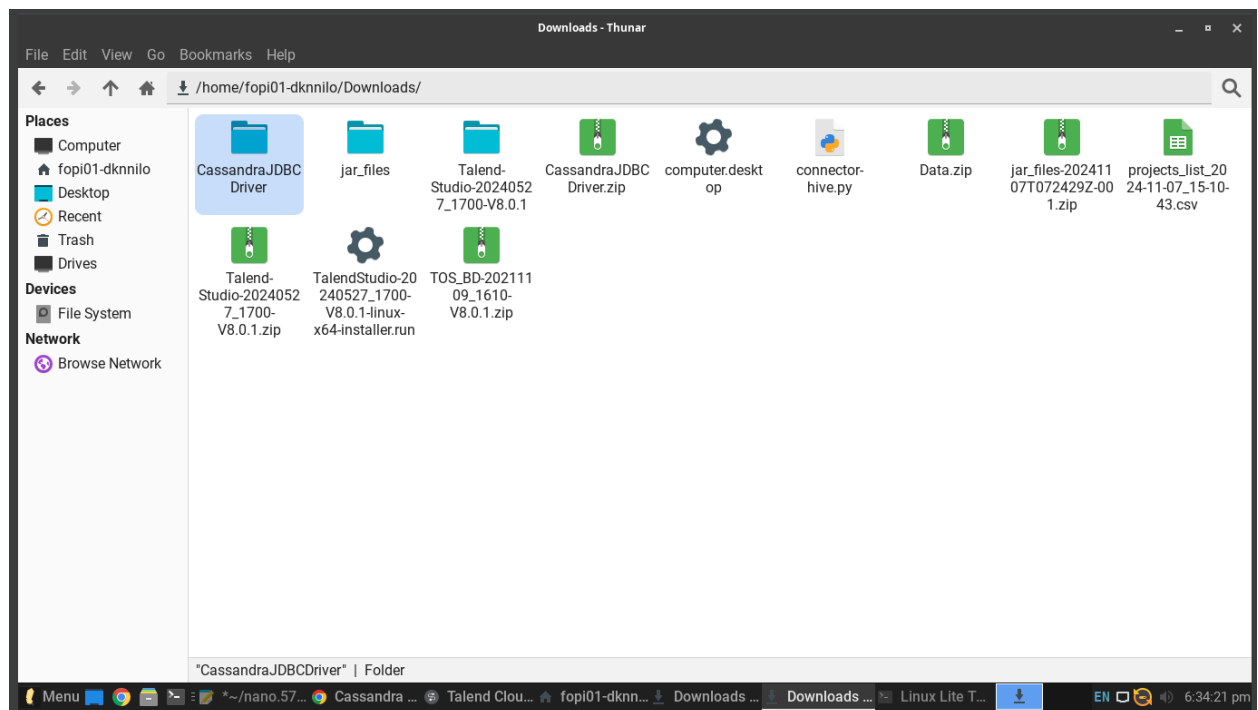
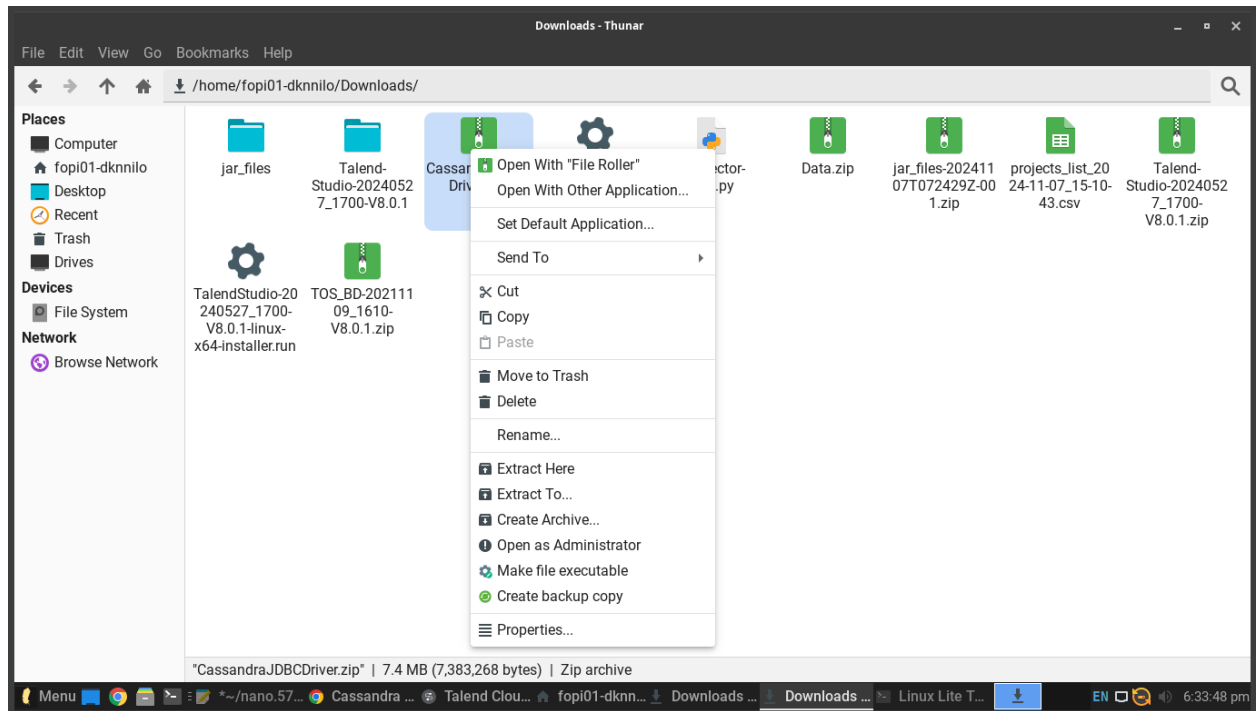
The next step after checking the `cctv_counts` table is downloading and installing the JDBC driver. Installing JDBC Driver is important as it enables users to connect with live Cassandra data from various applications that support JDBC connectivity, such as Talend. We installed the Cassandra JDBC Driver software using the link: <https://www.cdata.com/drivers/cassandra/download/jdbc/>. We clicked the Download Trial button and chose the Cross-Platform Unix/Linux Setup to download the software into our Linux Lite Virtual Machine.

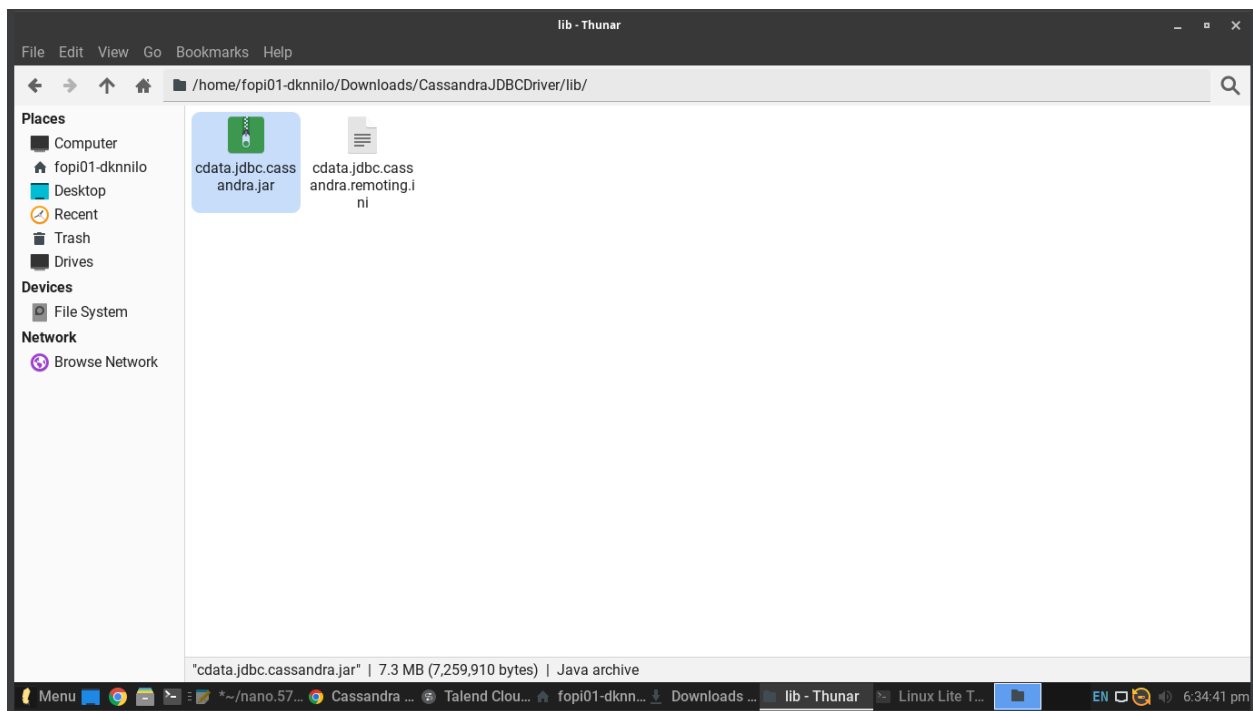




After the downloading process, we unzip the file to check its contents. The unzipped, folder contains the jar file for the JDBC and the configuration settings for the driver. In this activity, we will be using the jar file as shown in the later processes.



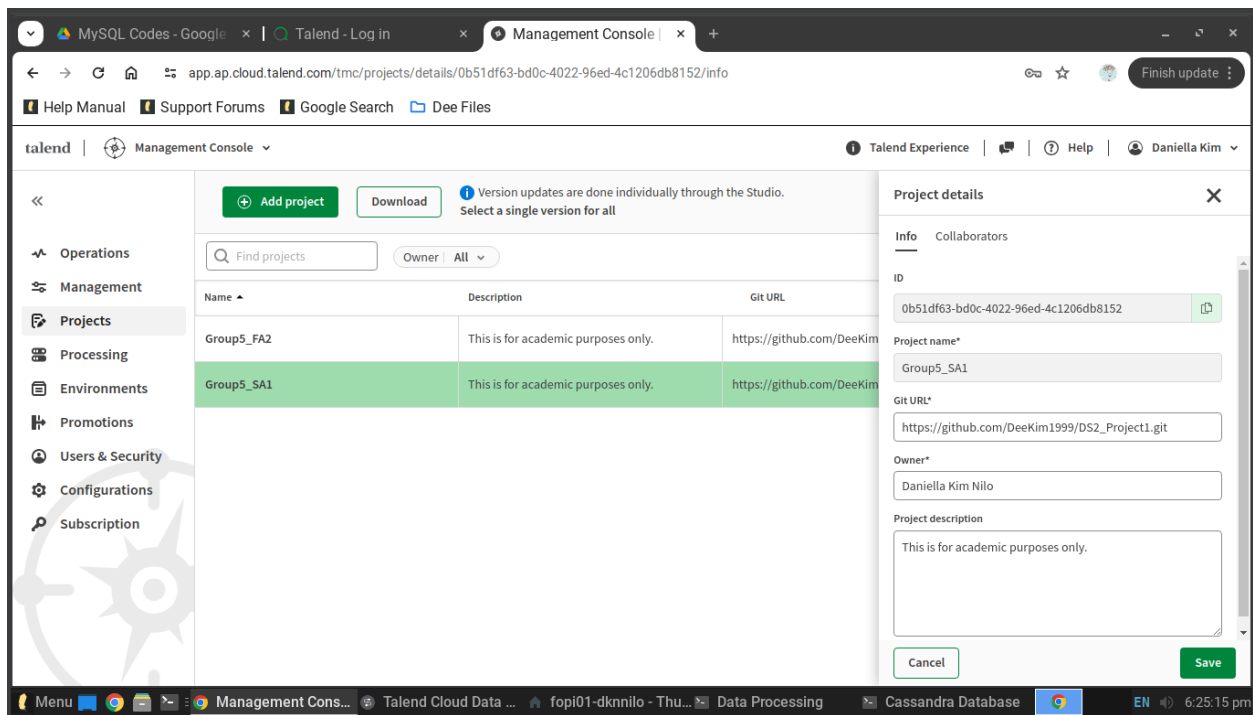




## **CREATING A NEW PROJECT**

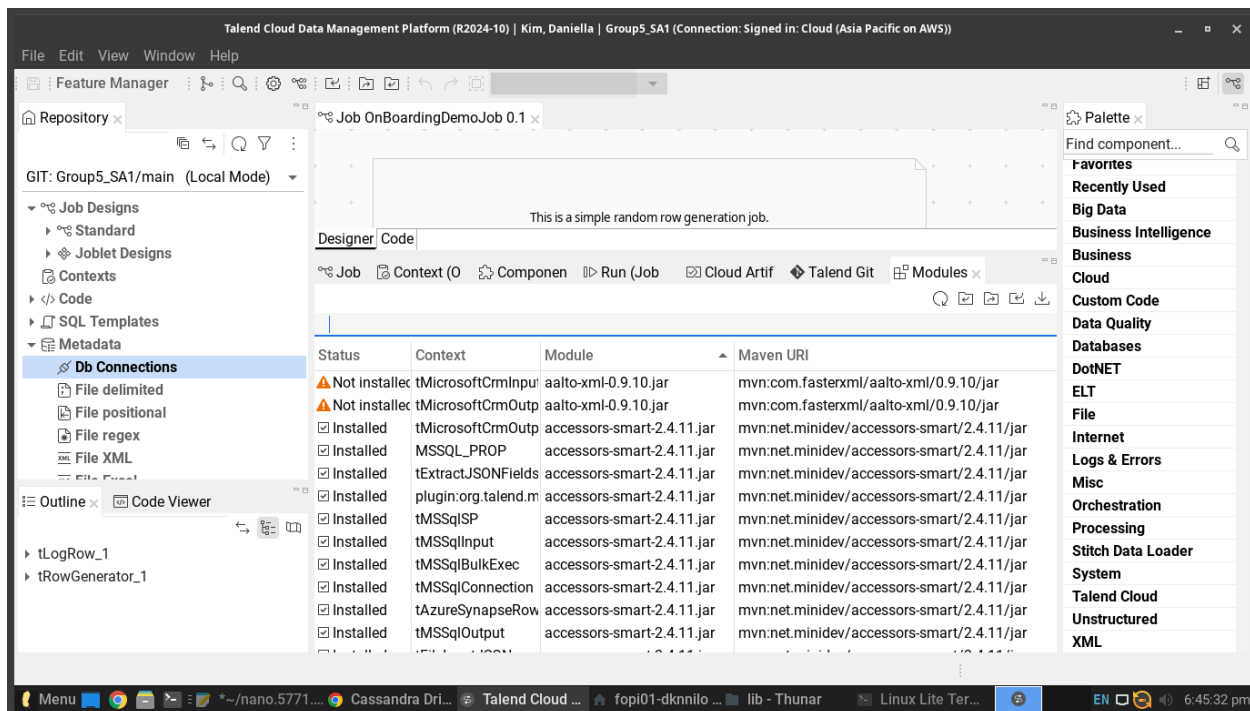
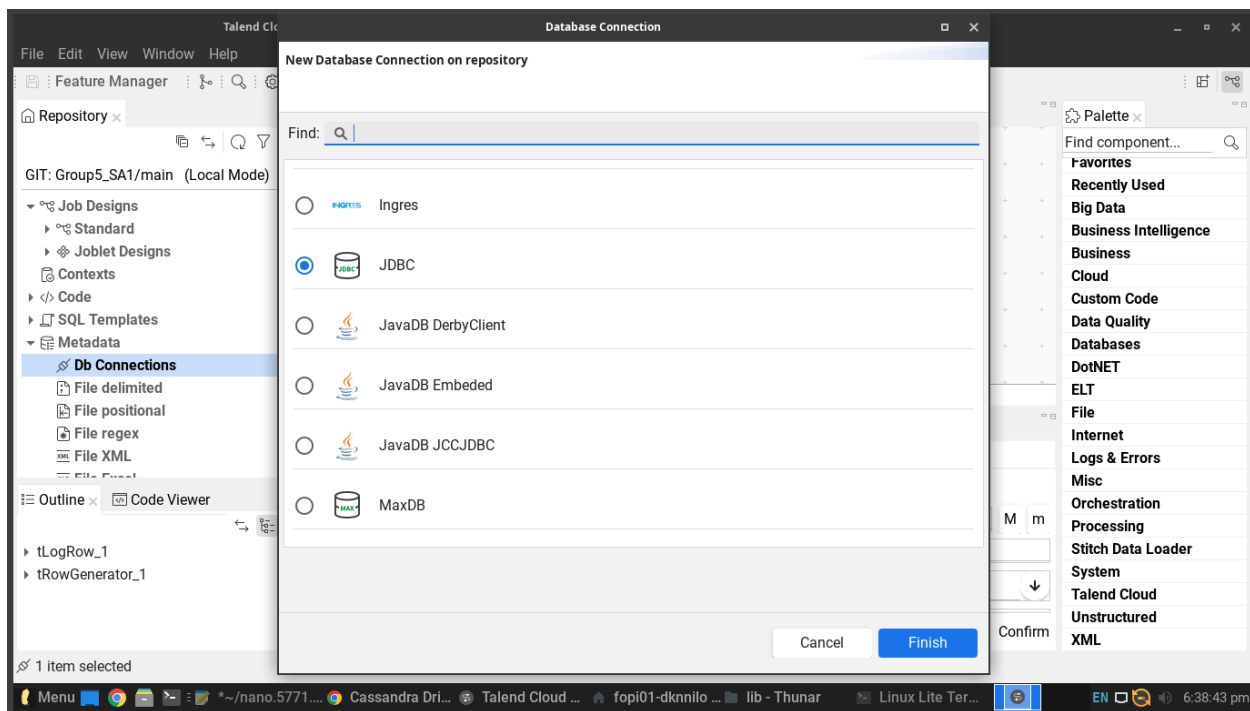
After ensuring the successful download of the JDBC Driver, we now moved on to creating a new Talend project. The project is saved in the Git URL and contains the following information as shown in the image.

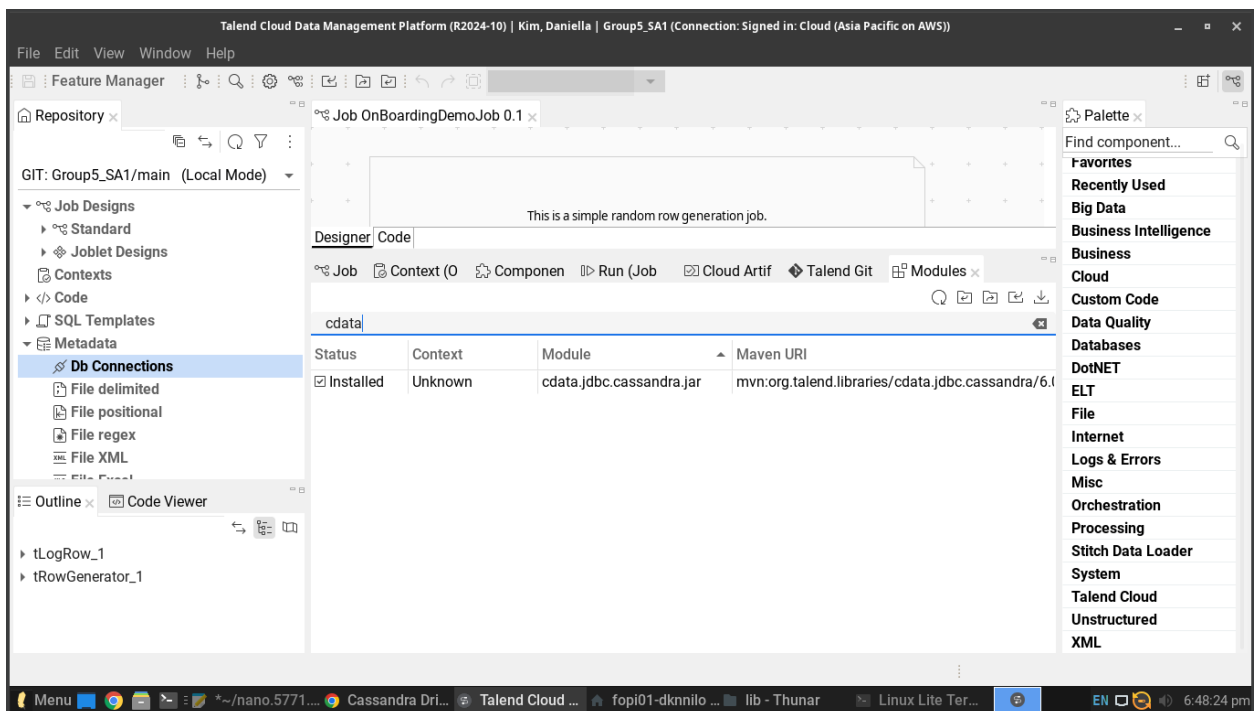
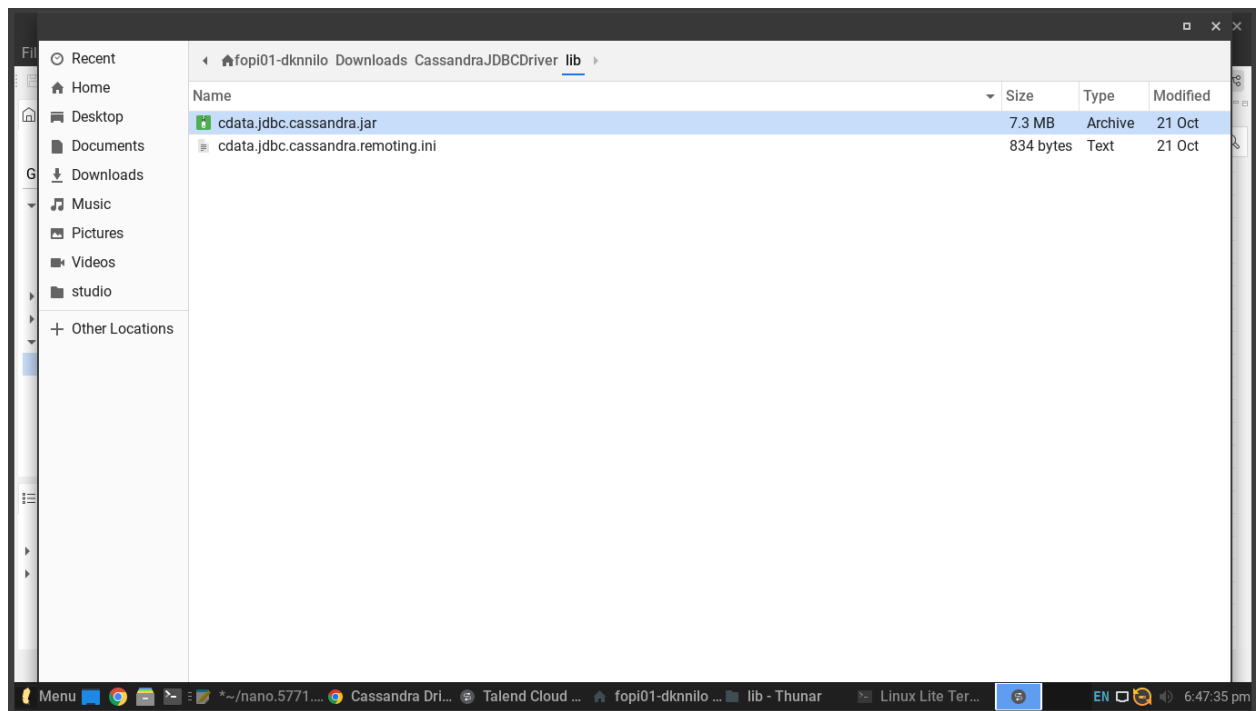




## CREATING A CONNECTION

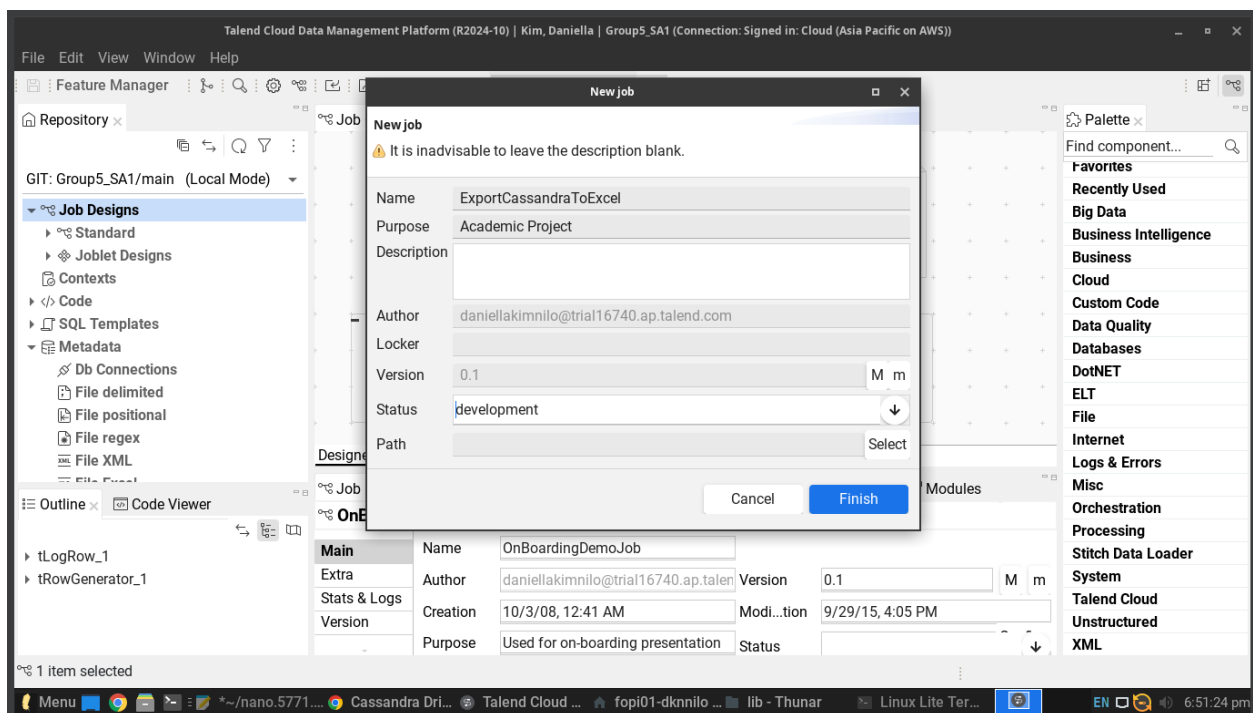
After successfully creating a project, our next step is to create a connection between Cassandra and Talend. The first thing we did was to choose the JDBC button as a database connection on the repository. Then on the Modules tab, we clicked the export external driver and loaded the JDBC Driver jar file we just downloaded. After loading the driver, we manually verified if it installed properly by typing `cdata` on the search bar.

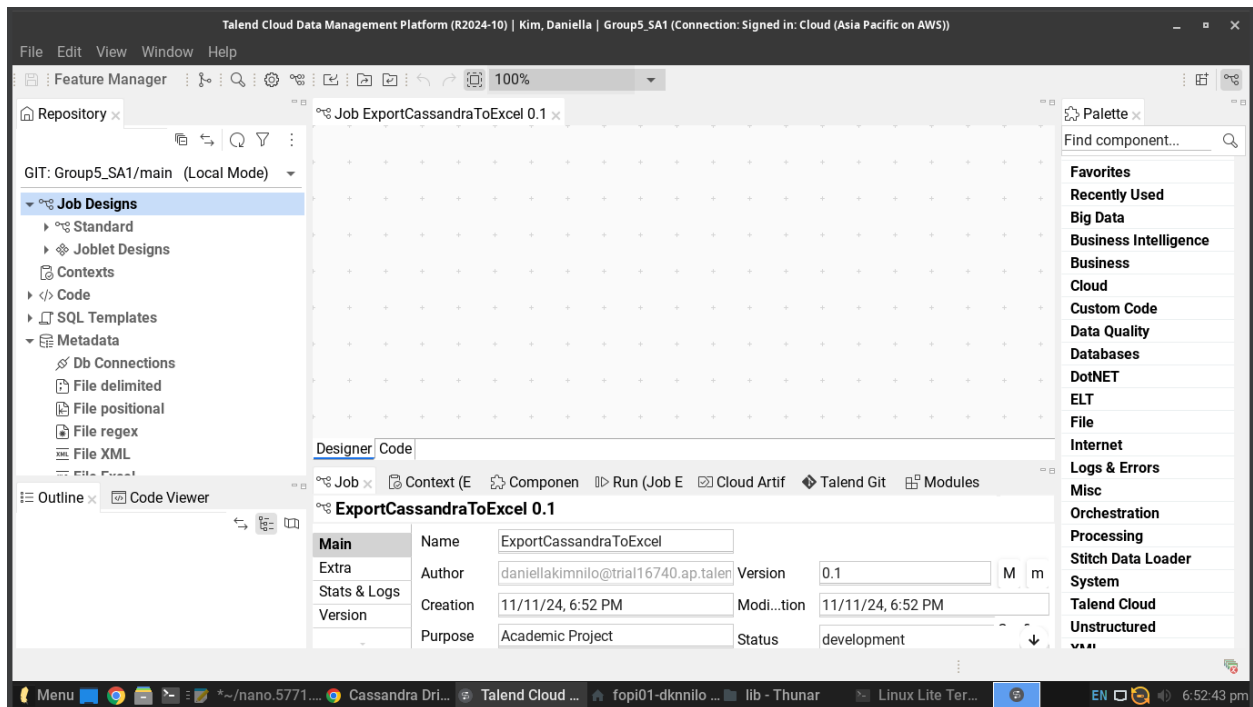




## CREATE A NEW JOB FOR CASSANDRA TO EXCEL

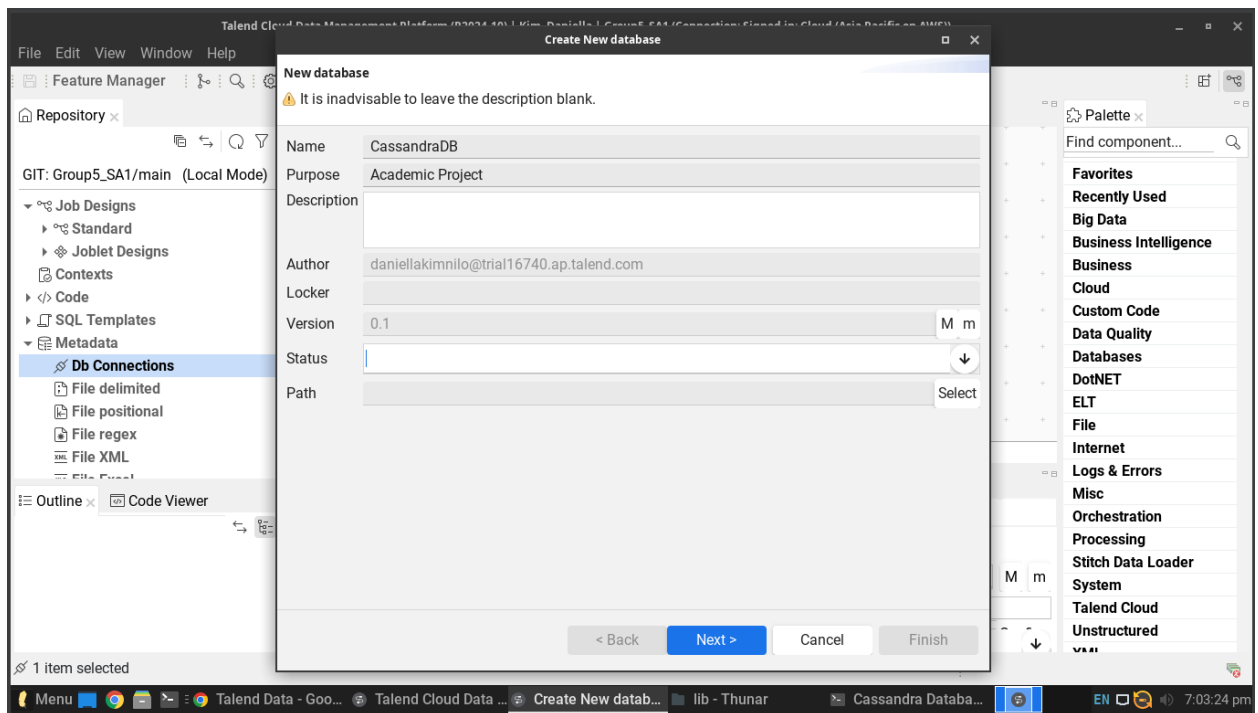
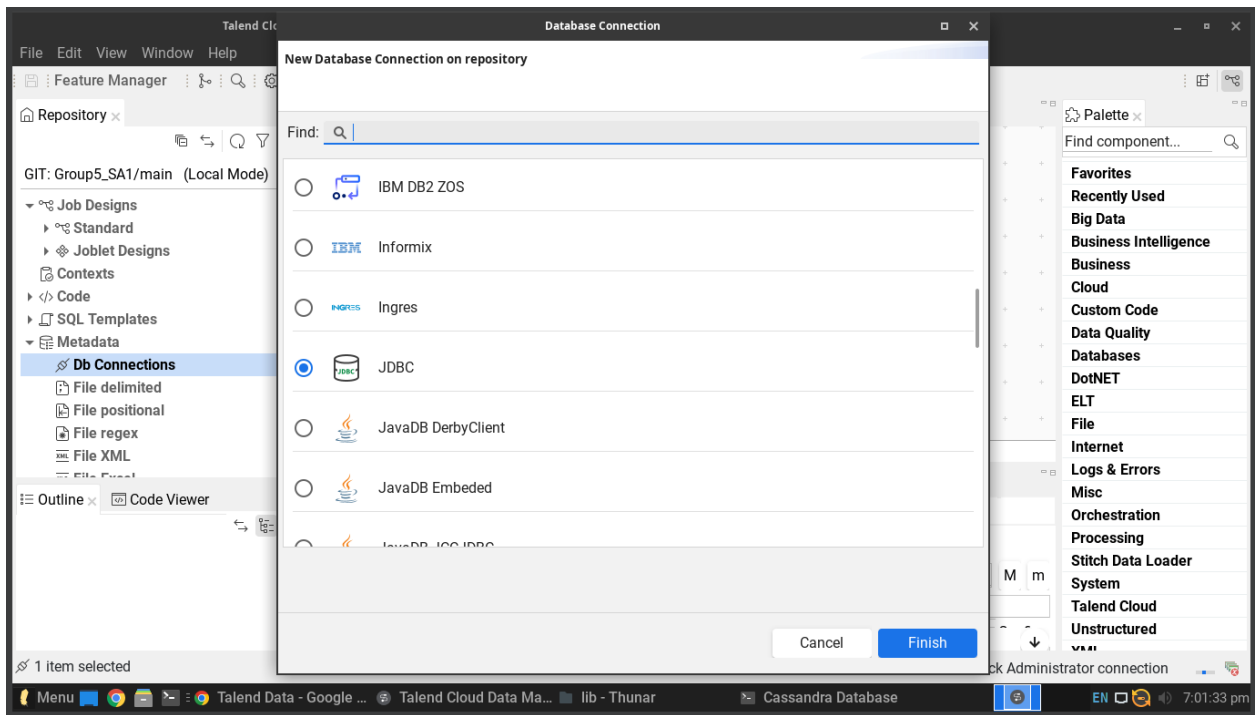
After creating a connection, we proceeded with creating a new job for exporting Cassandra data to Excel. In this step, we first click the new job button. We input the name of the project (ExportCassandraToExcel), its purpose (Academic Project), its status (development), and then clicked the Finish button. After clicking the button, we are re-directed into the workspace where the newly typed information is shown.

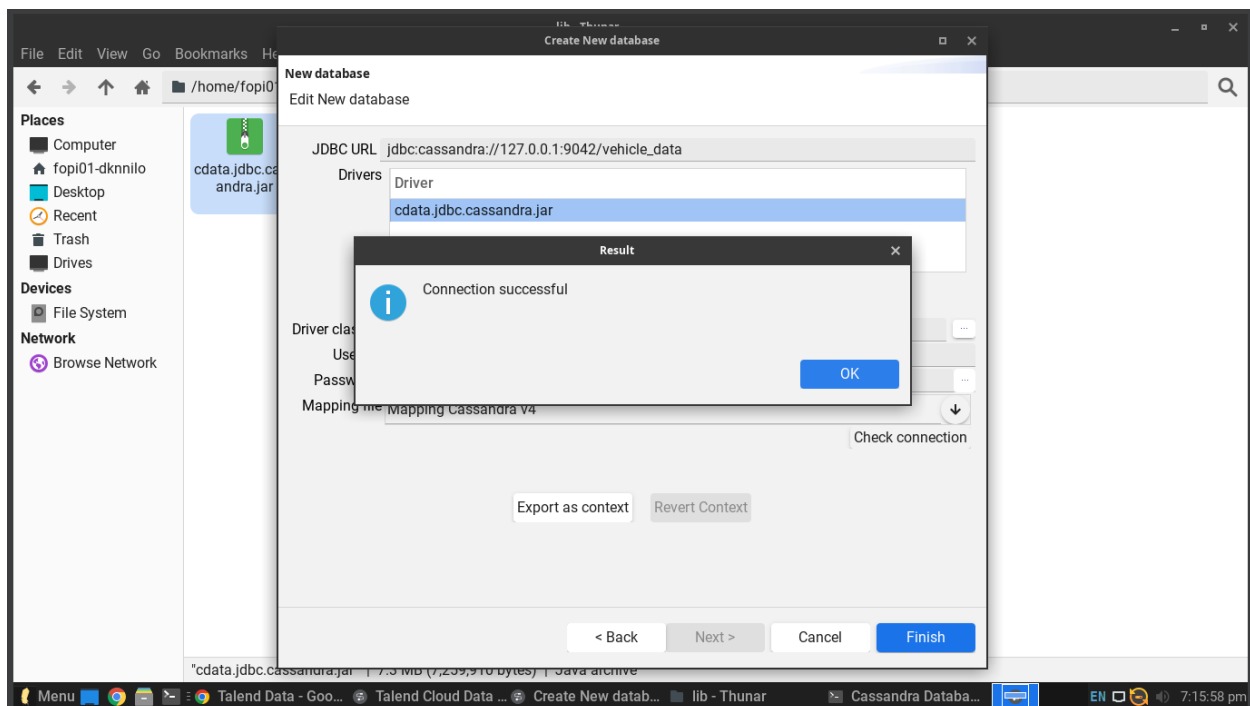
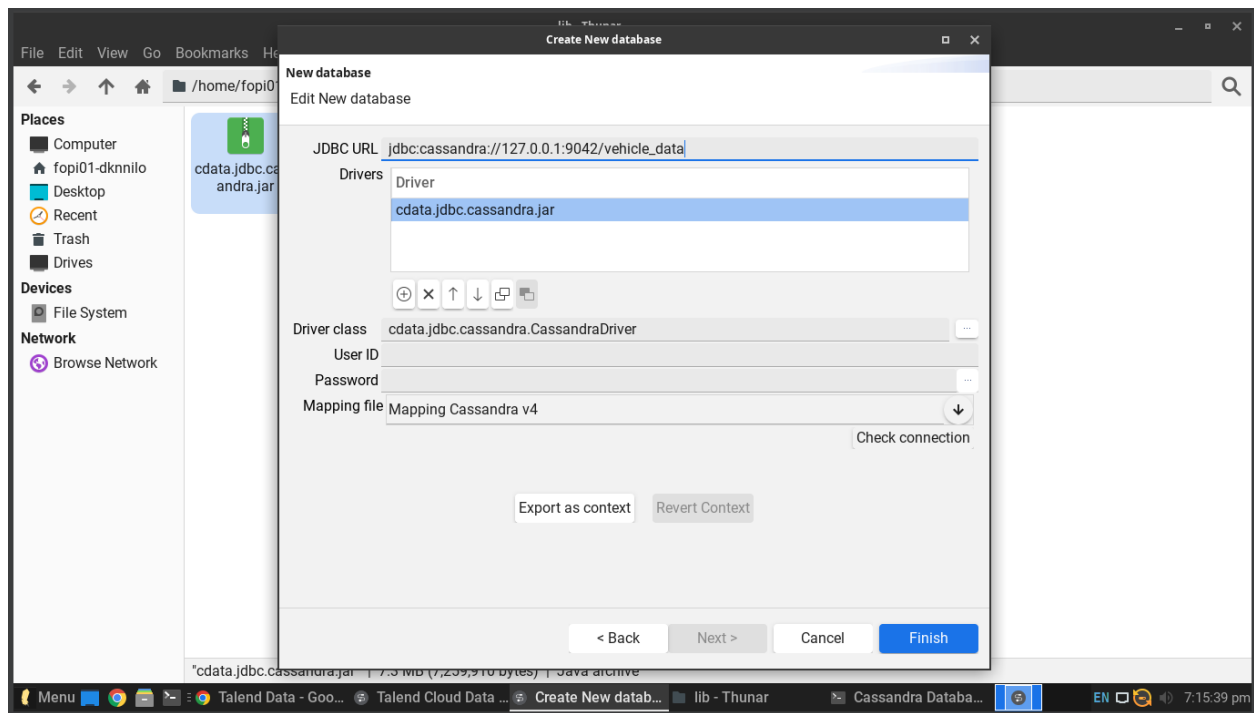




## CREATING A JDBC DB CONNECTION

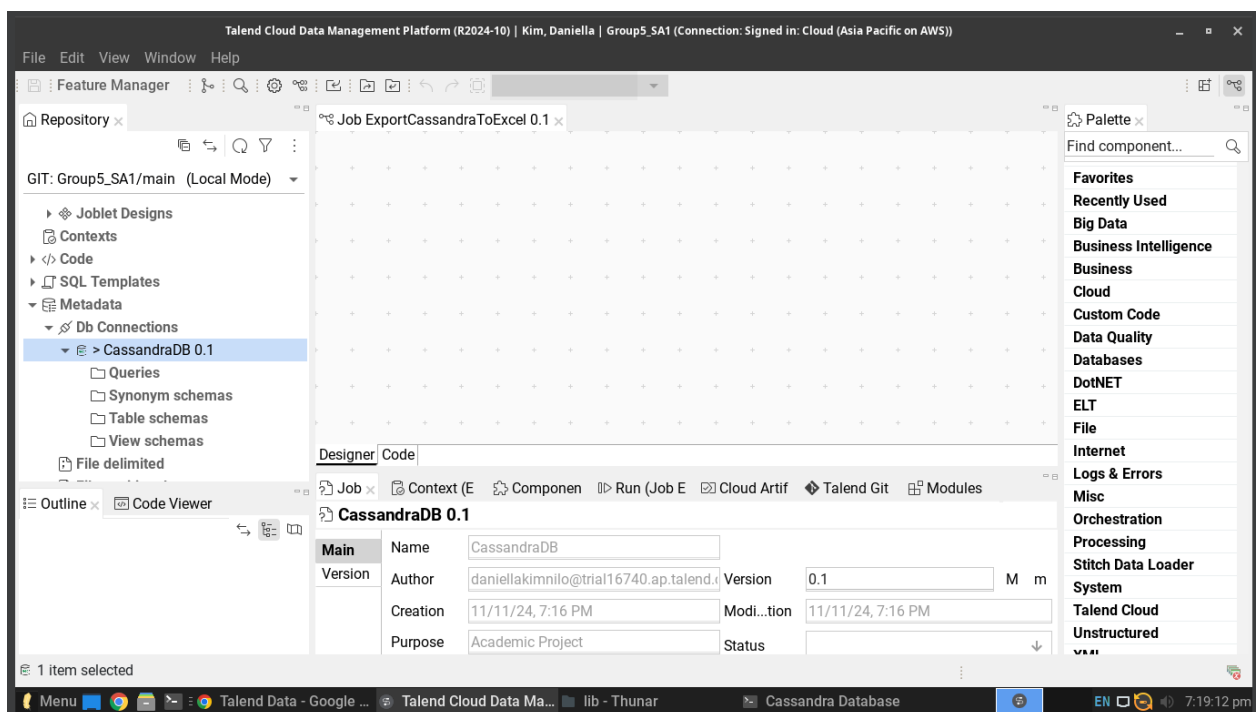
In creating this connection, we first clicked the JDBC button for the Database Connection window and entered Cassandra DB for name and Academic Project for Purpose in the Create New database window. We clicked the next button, and it redirected us to another page. On this page, we entered the JDBC URL (`jdbc:cassandra://127.0.0.1:9042/vehicle_data`) and clicked the `cdatan.jdbc.cassandra.jar` for the driver. We clicked the finish button to end the process. Another prompt showed our connection process is successful.



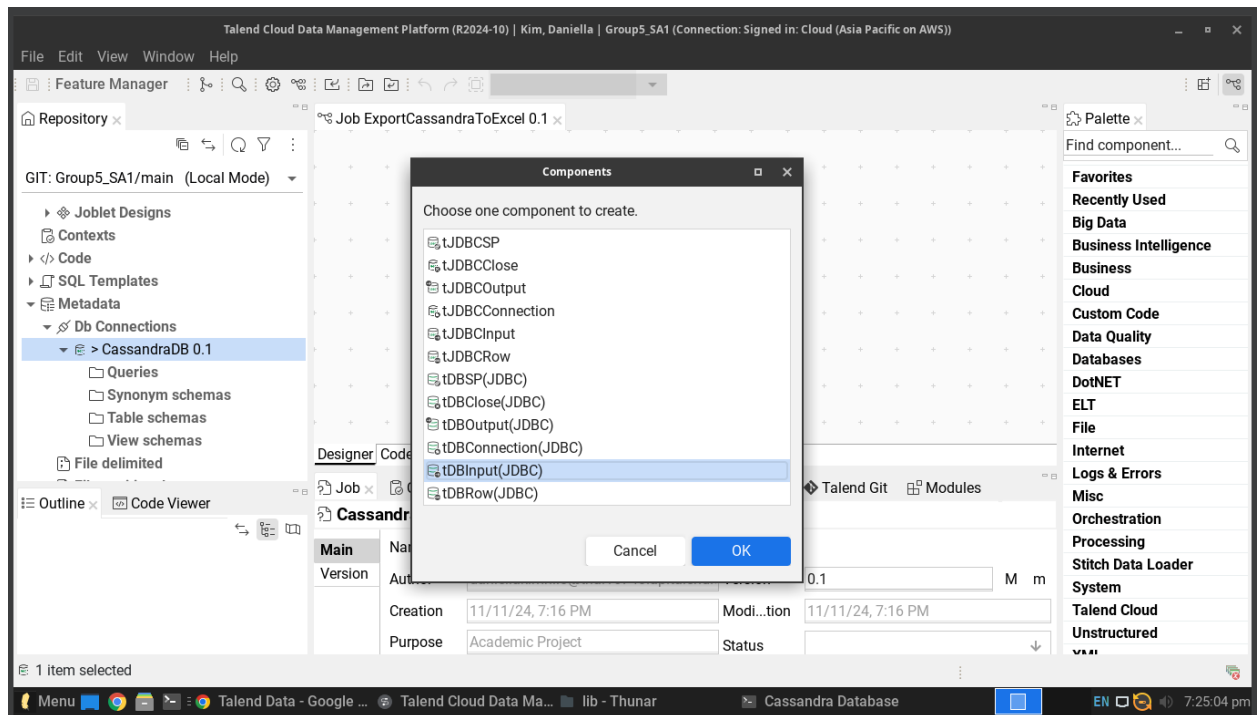


## EXPORTING PROCESS

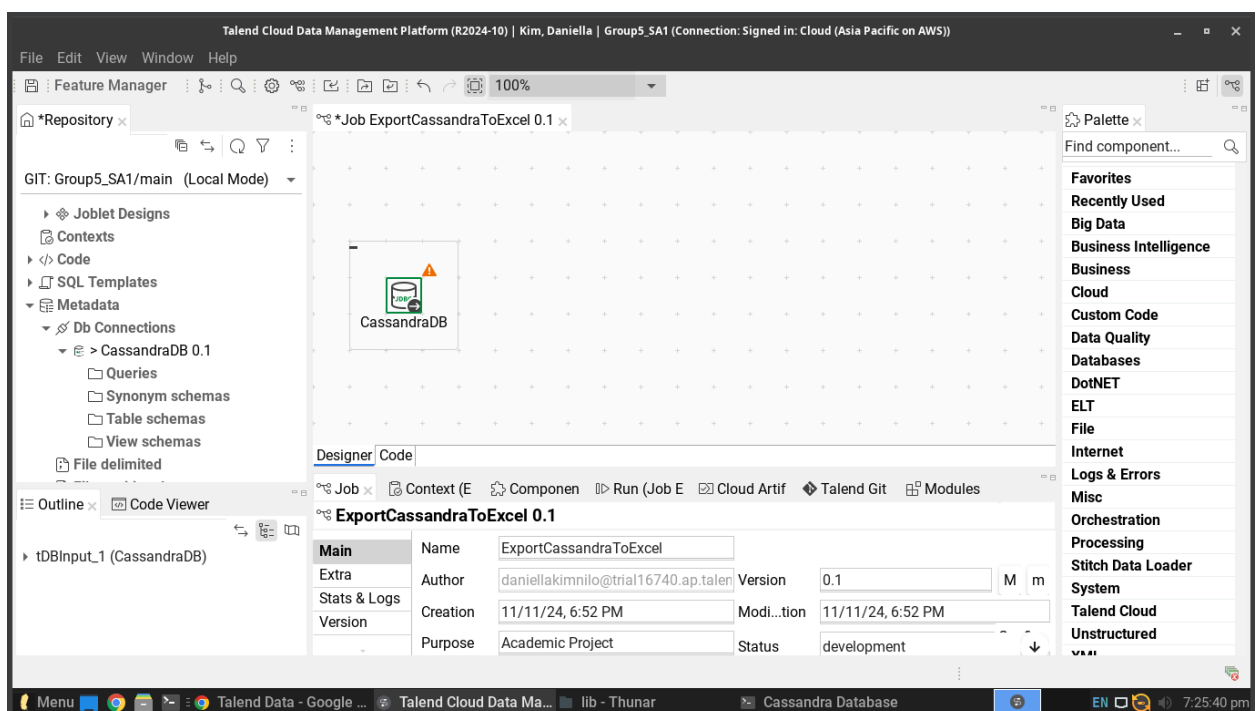
Clicking OK on the last prompt brought us back to the Job ExportCassandraToExcel 0.1 workspace. We dragged the CassandraDB 0.1 from the left pane and chose tDBInput(JDBC) from the list of components. The tDBInput(JDBC) is chosen because this component is designed to read data from a database using a JDBC connection and then acts as an input component in the Talend job.



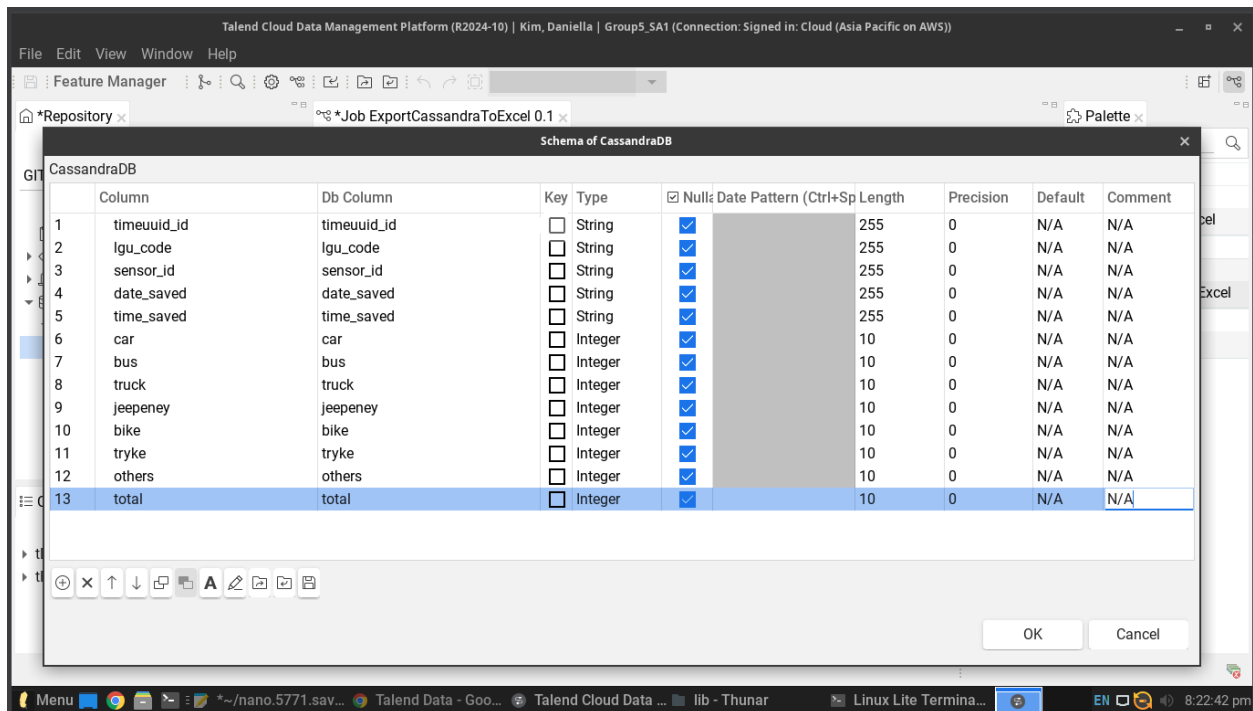
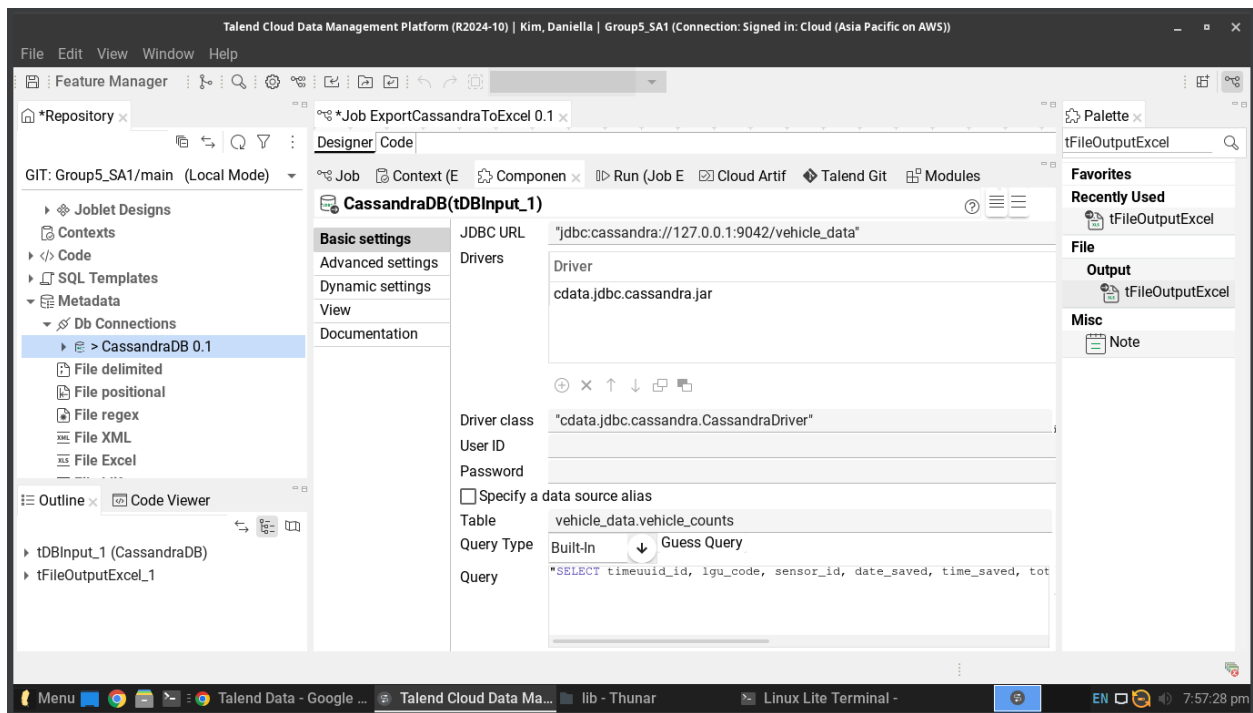




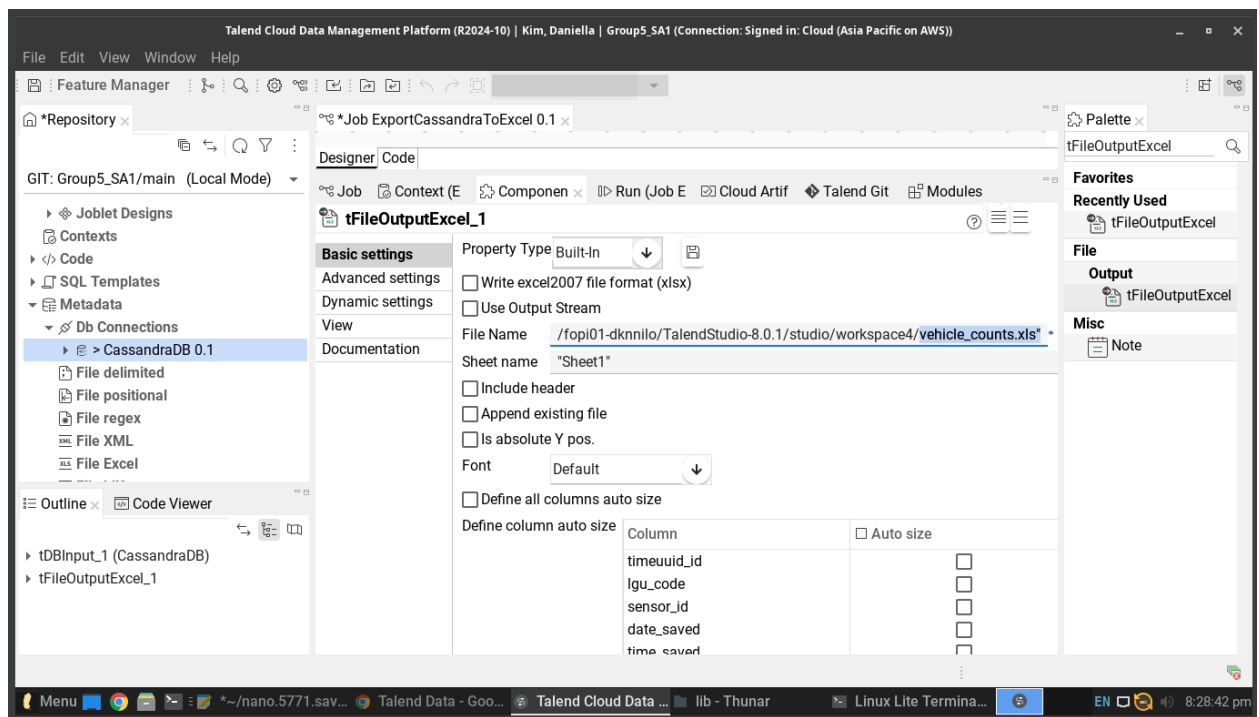
After clicking the OK button, the components tab closes, and the CassandraDB is imported into the workspace. From the left pallet, go to Outline and drag tFileOutputExcel. This component will write an Excel file with separated data values based on the data stored in the Cassandra schema.

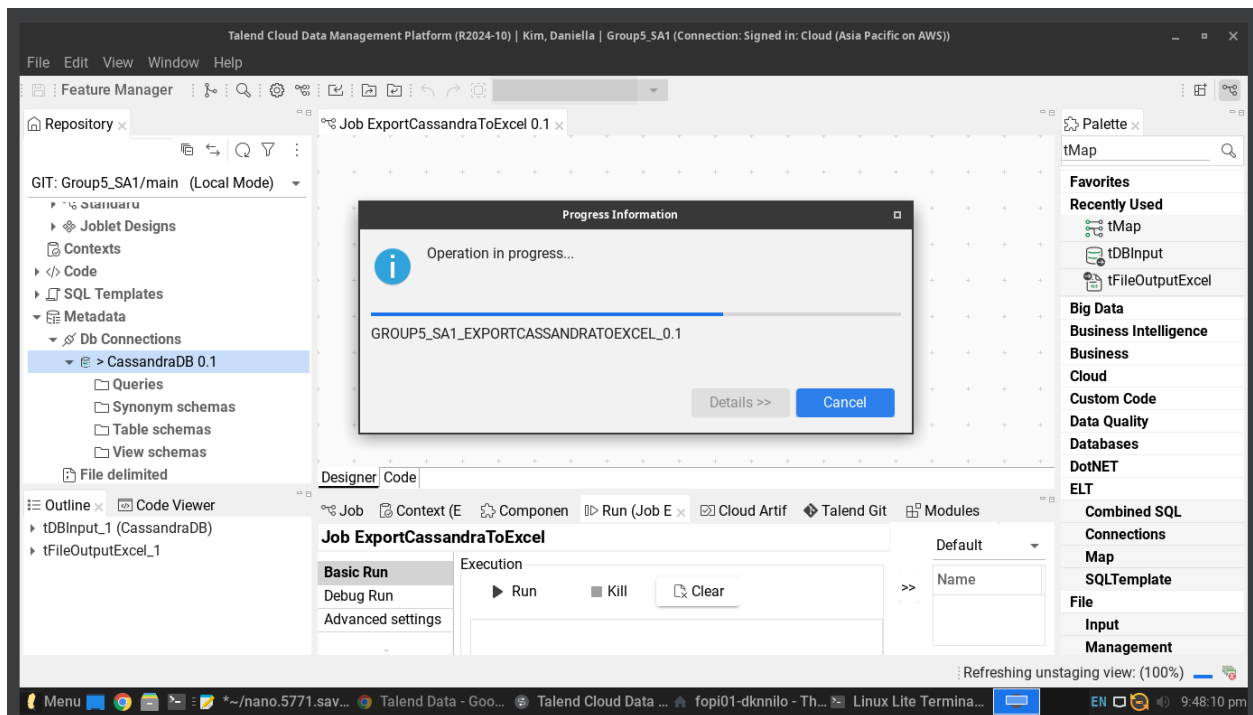
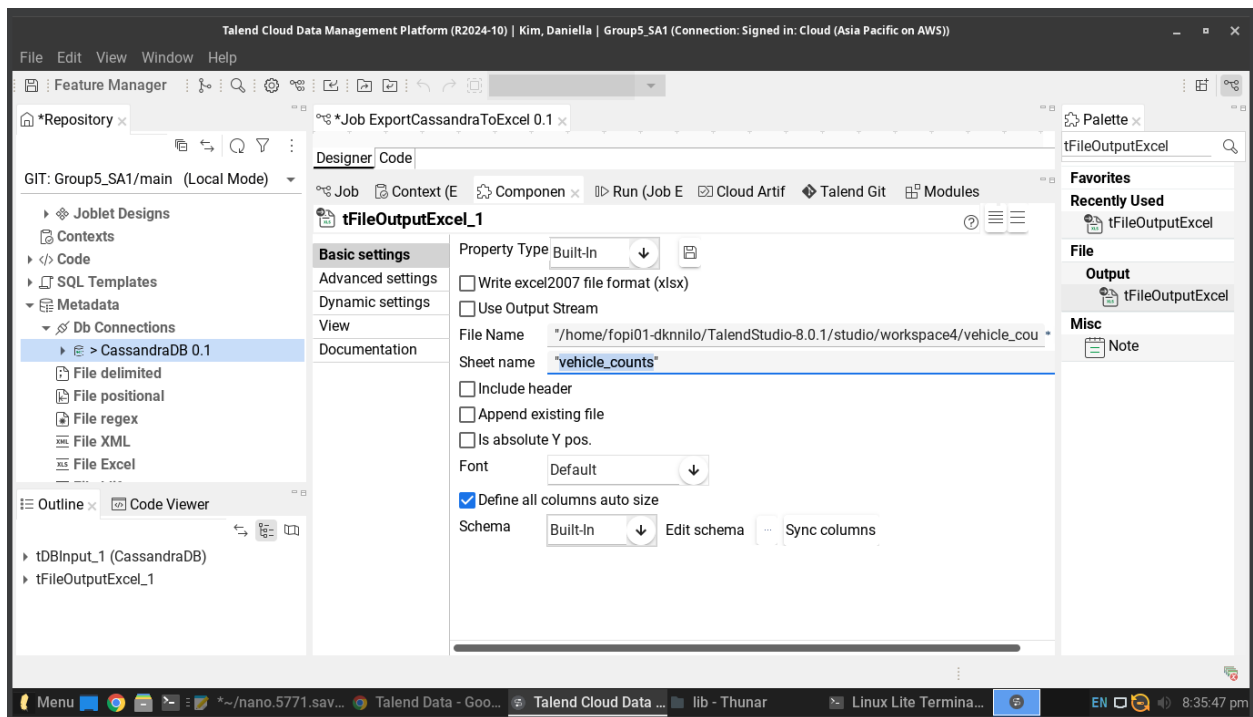




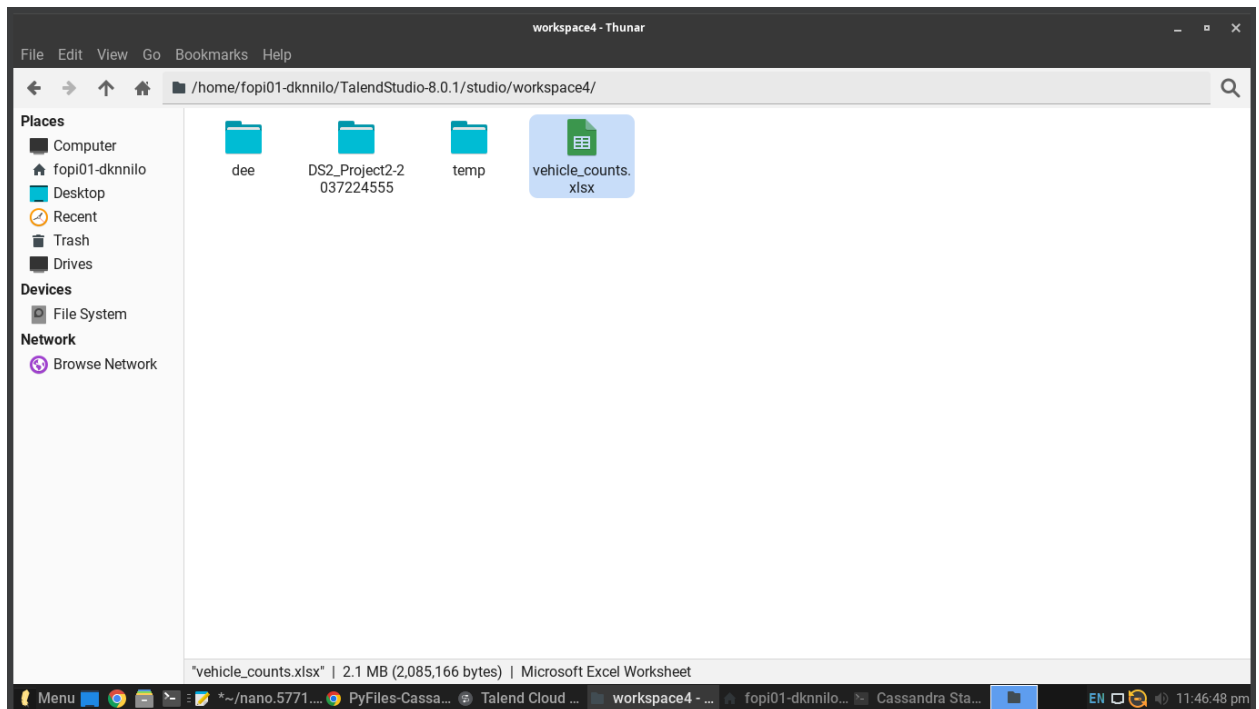


The next step is to connect the `tDBInput_1(CassandraDB)` to `tFileOutputExcel` by manually establishing a connection line between the two components. After establishing a connection, configure the `tFileOutputExcel` by clicking it and adjusting the Designer window. In the Components tab, go to the File Name text box and set the name of the file as `/home/fopi01-dknnilo/TalendStudio-8.0|1/studio/workspace4/vehicle_counts.xls` to convert the output to an Excel file. In the Sheet name textbox, remove `Sheet1` and replace it with `vehicle_counts`. Run the job and verify the converted Excel file in the workspace.





Go to the File Manager and verify if the exported .xls file is in the /home/fopi01-dknnilo/TalendStudio-8.0|1/studio/workspace4/ directory. Open the .xls file to view the export data. In this Excel file, the 36,000 entries from the 10 sensor\_ids saved on Cassandra are shown.



The screenshot shows a LibreOffice Calc spreadsheet titled 'vehicle\_counts.xlsx'. The spreadsheet displays a table with 23 rows of data. The columns are labeled: A (timeuuid\_jd), B (lgv\_code), C (sensor\_id), D (date\_saved), E (time\_saved), F (car), G (bus), H (truck), I (jeepney), J (bike), K (tryke), L (others), M (total), N, O, P, Q, R. The data rows contain hexadecimal timeuuids, sensor IDs, timestamps, and counts for different vehicle types.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	timeuuid_jd	lgv_code	sensor_id	date_saved	time_saved	car	bus	truck	jeepney	bike	tryke	others	total					
2	e3ee4103-9aae-1200	sensor_05	11042024	21:15:42	1	2	2	2	5	2	2	16						
3	a5ec5258-9ab2-1200	sensor_07	11042024	21:42:36	1	2	2	1	1	3	2	12						
4	a5a5908d-9ab1-1200	sensor_09	11042024	21:35:25	1	0	1	2	3	2	0	9						
5	cf0ca99a-9ab0-1200	sensor_10	11042024	21:29:25	4	0	2	1	0	3	2	12						
6	59569fc9-9ab5-1200	sensor_08	11042024	22:01:55	1	1	0	1	5	3	2	13						
7	1e09b6c6-9ab2-1200	sensor_04	11042024	21:38:48	2	2	2	1	4	2	0	13						
8	d7fd1012-9aae-1200	sensor_05	11042024	21:15:21	0	1	1	0	0	3	2	7						
9	100c82aa-9ab3-1200	sensor_06	11042024	21:45:33	4	0	0	2	1	0	0	7						
10	2cfa4fe3-9ab0-1200	sensor_03	11042024	21:24:54	2	0	1	0	3	0	1	7						
11	7a328f97-9ab3-1200	sensor_04	11042024	21:48:31	1	1	2	2	1	0	2	9						
12	daf9b820-9ab4-1200	sensor_10	11042024	21:58:23	3	2	1	2	5	0	2	15						
13	83a56784-9ab3-1200	sensor_09	11042024	21:48:47	2	1	0	0	0	2	1	6						
14	3162447a-9aad-1200	sensor_03	11042024	21:03:33	2	2	2	0	4	0	2	12						
15	bc68ef26-9ab1-1200	sensor_09	11042024	21:36:04	3	1	2	2	2	0	1	11						
16	c58d41a9-9ab2-1200	sensor_07	11042024	21:40:47	0	1	2	1	1	2	0	7						
17	025ce46d-9ab1-1200	sensor_07	11042024	21:30:51	3	1	2	2	3	2	0	13						
18	db907e64-9aae-1200	sensor_09	11042024	21:15:27	1	2	0	2	2	0	0	7						
19	7fd4fc00-9aae-1200	sensor_02	11042024	21:12:53	0	1	2	1	3	3	0	10						
20	5860441a-9ab1-1200	sensor_05	11042024	21:33:15	0	2	0	1	5	1	2	11						
21	574c0f1f-9ab2-1200	sensor_07	11042024	21:40:24	4	2	1	0	0	2	0	9						
22	c751be94-9ab2-1200	sensor_07	11042024	21:43:31	2	0	1	0	1	3	0	7						
23	fc63eb89-9ab4-1200	sensor_02	11042024	21:59:19	0	1	0	0	2	2	0	5						

