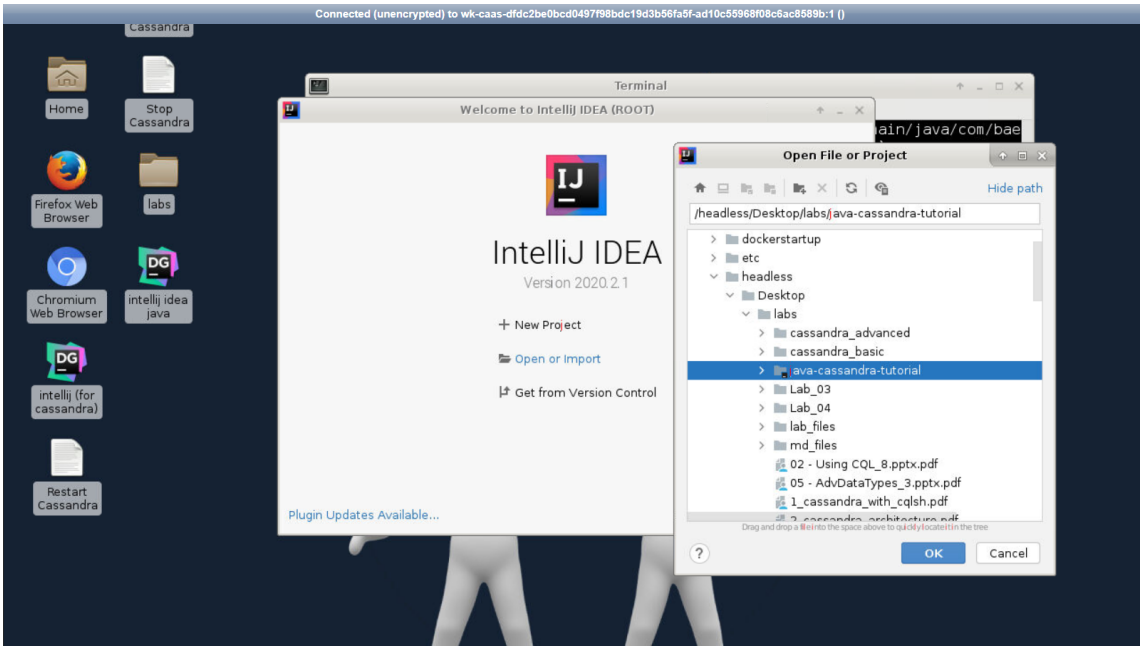
Cassandra – Getting Started with Java

Cassandra is a great tool for storing time series data and I happen to be using it on my current project for that exact purpose.

There are several ways to use Cassandra from Java and many ways to improve performance, but here I just want to provide a simple "Getting Started" example. So here it is!

Code for this lab is located in `/headless/Desktop/labs/java-cassandra-tutorial`. Open project in IntelliJ IDE as shown below:



Maven Project

Create a Java project, if using Maven, you can add the following dependencies to your pom.xml file:

```
<dependency>
    <groupId>com.datastax.cassandra</groupId>
    <artifactId>cassandra-driver-core</artifactId>
    <version>3.8.0</version>
</dependency>
```

Here is a simple Java example showing how to connect to Cassandra, create a keyspace, create a table, insert a row, and select a row:

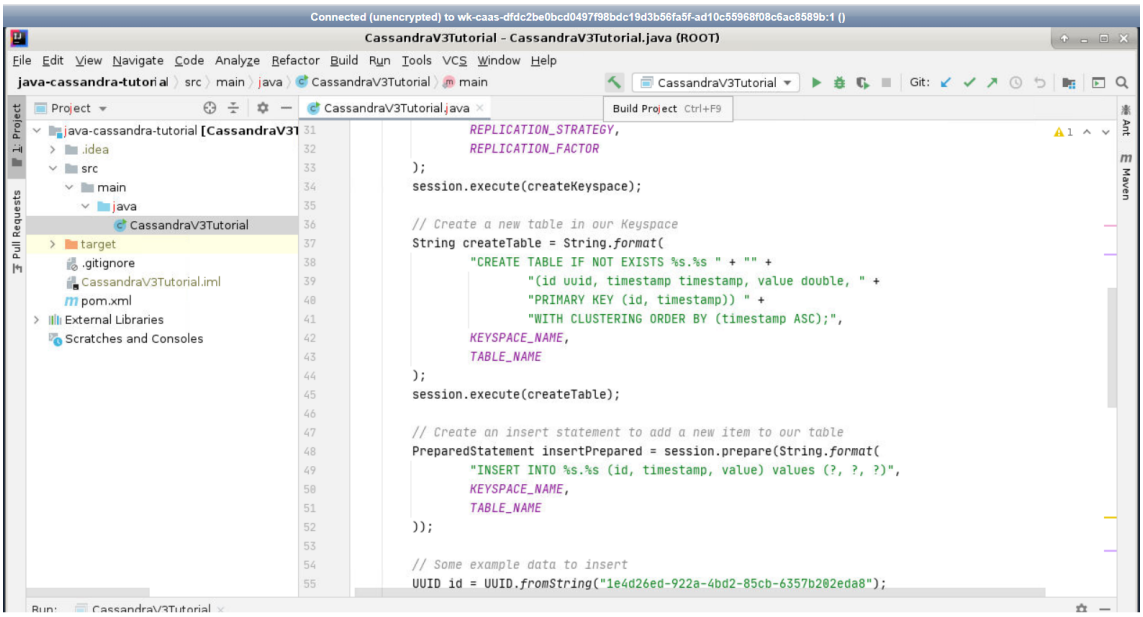
```
import com.datastax.driver.core.*;

import java.time.Instant;
import java.time.ZoneId;
import java.util.Date;
import java.util.UUID;

public class CassandraV3Tutorial {
```

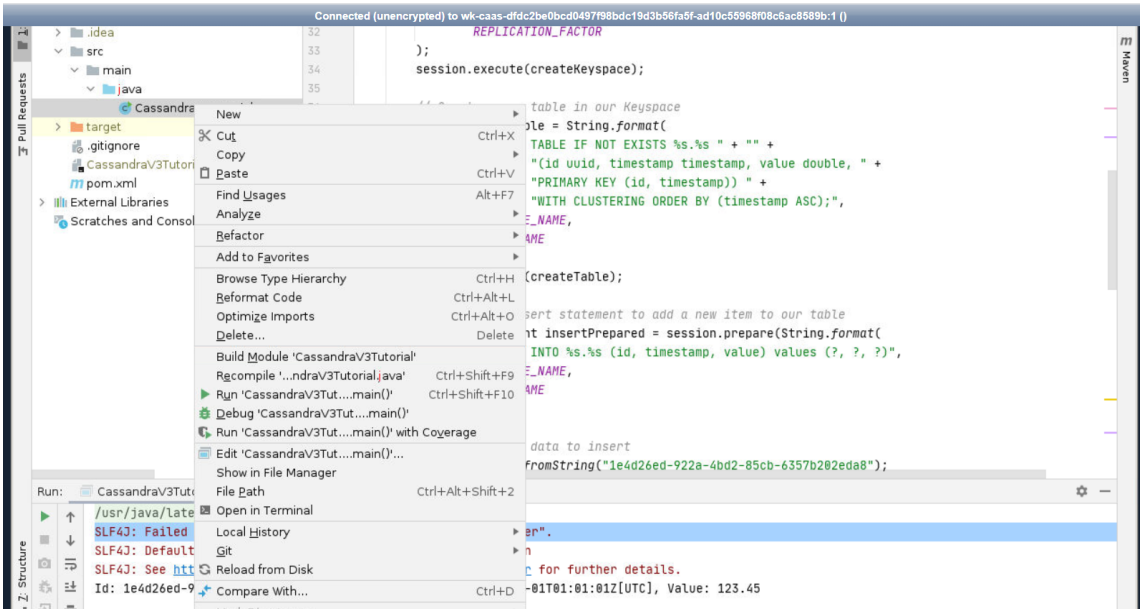
```
private final static String KEYSPACE_NAME = "example_keyspace";
private final static String REPLICATION_STRATEGY = "SimpleStrategy";
private final static int REPLICATION_FACTOR = 1;
private final static String TABLE_NAME = "example_table";

public static void main(String[] args) {

    // Setup a cluster to your local instance of Cassandra
    Cluster cluster = Cluster.builder()
            .addContactPoint("localhost")
            .withPort(9042)
            .build();

    // Create a session to communicate with Cassandra
    Session session = cluster.connect();

    // Create a new Keyspace (database) in Cassandra
    String createKeyspace = String.format(
            "CREATE KEYSPACE IF NOT EXISTS %s WITH replication = " +
                    "{'class':'%s','replication_factor':%s};",
            KEYSPACE_NAME,
            REPLICATION_STRATEGY,
            REPLICATION_FACTOR
    );
    session.execute(createKeyspace);

    // Create a new table in our Keyspace
    String createTable = String.format(
            "CREATE TABLE IF NOT EXISTS %s.%s " + "" +
                    "(id uuid, timestamp timestamp, value double, " +
                    "PRIMARY KEY (id, timestamp)) " +
                    "WITH CLUSTERING ORDER BY (timestamp ASC);",
            KEYSPACE_NAME,
            TABLE_NAME
    );
    session.execute(createTable);

    // Create an insert statement to add a new item to our table
    PreparedStatement insertPrepared = session.prepare(String.format(
            "INSERT INTO %s.%s (id, timestamp, value) values (?, ?, ?)",
            KEYSPACE_NAME,
            TABLE_NAME
    ));

    // Some example data to insert
    UUID id = UUID.fromString("1e4d26ed-922a-4bd2-85cb-6357b202eda8");
    Date timestamp = Date.from(Instant.parse("2018-01-01T01:01:01.000Z"));
    double value = 123.45;

    // Bind the data to the insert statement and execute it
    BoundStatement insertBound = insertPrepared.bind(id, timestamp, value);
```

```
        session.execute(insertBound);

        // Create a select statement to retrieve the item we just inserted
        PreparedStatement selectPrepared = session.prepare(String.format(
                "SELECT id, timestamp, value FROM %s.%s WHERE id = ?",
                KEYSPACE_NAME,
                TABLE_NAME));

        // Bind the id to the select statement and execute it
        BoundStatement selectBound = selectPrepared.bind(id);
        ResultSet resultSet = session.execute(selectBound);

        // Print the retrieved data
        resultSet.forEach(row -> System.out.println(
                String.format("Id: %s, Timestamp: %s, Value: %s",
                row.getUUID("id"),
                row.getTimestamp("timestamp").toInstant().atZone(ZoneId.of("UTC")),
                row.getDouble("value"))));

        // Close session and disconnect from cluster
        session.close();
        cluster.close();
    }
}
```

Run Java Application

Make sure cassandra is running before running the example.





If you would like to look at the data in your local Cassandra database, you can use the CQLSH command line tool.

Type `cqlsh` in the terminal.

This will take you to a "cqlsh>" prompt:

```
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.11.5 | CQL spec 3.4.4 | Native protocol v4]
Use HELP for help.
cqlsh>
```

To view all available Keyspaces:

`DESCRIBE KEYSPACES;`

You will now see our "example_keyspace" in the list:

```
cqlsh> DESCRIBE KEYSPACES;

system_schema  system    system_traces
system_auth    system_distributed    example_keyspace
```

To switch to that Keyspace: `USE example_keyspace;`

```
cqlsh> USE example_keyspace;
cqlsh:example_keyspace>
```

To show all tables in the keyspace: `DESCRIBE TABLES;`

You should see the new table "example_table":

```
cqlsh:example_keyspace> DESCRIBE TABLES;

example_table
```

Now from the command line you can view the data in the table by using a select statement:

```
SELECT * FROM example_table;
```

Which will show the following information:

```
id                                   | timestamp                       | value
--------------------------------------+---------------------------------+-------
1e4d26ed-922a-4bd2-85cb-6357b202eda8 | 2018-01-01 01:01:01.000000+0000 | 123.45
```