1. Explain the differences between Cassandra and typical databases.

Ans:-**Cassandra vs RDBMS**

The main difference between Cassandra and RDBMS is that Cassandra deals with unstructured data that uses a wide-column store and NoSQL for database management. It is designed to handle massive data across many commodity servers. Although working for enormous data, it provides high availability and no point failure. In contrast, RDBMS deals with structured data using SQL, thereby validating and maintaining a database.

Main Differences Between Cassandra and RDBMS

These are some of the most commonly used database management, whereas their functionality and basics are diverse. The main difference is structure, usage of SQL, and relation of data. Cassandra manages unstructured and non-related data using NoSQL, whereas RDBMS deals with structured and related data using SQL.

1. Cassandra supports a column-oriented database, whereas RDBMS supports a row-oriented database
2. Cassandra deals with massive amount of data.
   whereas RDBMS deals with a dense amount of data.
3. In Cassandra, the stored data is non-related, whereas RDBMS consists of related data.
4. Cassandra deals with unstructured data. And in contrast, RDBMS deals with structured data.
5. In Cassandra, the flexible schema is used; while in RDBMS, the fixed schema is used.
6. Cassandra organized horizontally. RDBMS, on the other hand, is organized vertically.
7. Cassandra has faster and higher performance than RDBMS.

Moreover, Cassandra has NoSQL database management, and RDBMS has SQL database management. Even, the location for stored data is different for both. Cassandra stores data in various locations, On the other hand, RDBMS stores in one physical location or few.

Cassandra vs HBase

The main difference between Cassandra and HBase is that Cassandra can help with storage as well as with data management, whereas HBase is only fit for data management. Cassandra has built-in technologies, whereas HBase depends on other technologies for status management. Cassandra never faces downtimes, whereas HBase does due to its master-based architecture.

HBase is also a column-based management system. It works dynamically, which makes it easier to insert and modify data at any point in time. It consists of column families, which are further divided into rows so as store data in different regions.

Cassandra vs MongoDB

The main difference between Cassandra and MongoDB is that while the former works on a hybrid data model consisting of tabular structure and key value, and uses a “peer-to-peer” architecture model, the latter’s data model is object and document-oriented, and it uses a “master-slave” model.

MongoDB is also an open-source NoSQL database and is based on the “master-slave” model. Consequently, when the master node is unable to function, a slave node can assume the role of the master node but this transition takes a few minutes, and during this period, the database is not in a position to respond to requests. This affects the data availability. MongoDB is also limited in terms of scalability since only the master node can write and accept inputs and the slave nodes come in handy only for reads.

2. What exactly is CQLSH?
   Cassandra Query Language Shell (CQLSH) is basically a communication medium between Cassandra and the user. CQLSH is a platform that allows the user to launch the Cassandra query language(CQL). The user can perform many operations using cqlsh.

3. Explain the Cassandra cluster idea.

Ans:- Large organizations store huge amounts of data on multiple nodes. These nodes communicate with each other which serves the purpose behind the Cassandra cluster being established.

The cluster is a collection of nodes that represents a single system. These clusters form the database in Cassandra to effectively achieve maintaining a high level of performance. As the size of your cluster grows, the number of clients increases, and more keyspaces and tables are added, the demands on your cluster will begin to pull in different directions. Taking frequent baselines to measure the performance of your cluster against its goals will become increasingly important.

4. Give an example to demonstrate the class notion.

Notion is a great app that all students can use to **organise their notes**. Here are some of the things you can do with it: Create an interactive to-do list Make notes that help you study using the toggle feature Organise your classes and lectures Remember to keep things simple when you

first get started and not copy templates from random videos.

5. Use an example to explain the object.

Ans:- A python is an object-oriented programming language. Almost everything in Python is considered as an object. An object has its own properties(attributes) and behavior(methods).

A class is a blueprint of the objects or can be termed as object constructor for creating objects.

One class can have many objects and value of properties for different objects can be different.

Example of properties and behavior of an object

Let’s take the example of car as an object. Its properties will include its color, company name, year of manufacture , price , mileage etc. The behavior of the car will include the functions it can perform, this will include increase speed, decrease speed, apply brakes etc. Object basically related everything with real life objects. Everything we find around us in real life has some properties and some functions.

Example program:-

```
class Person:
   name=""
   age=0
   city=""
   def display(self):
      print("Name : ",self.name)
      print("Age : ",self.age)
      print("City : ",self.city)

p1=Person()
p1.name="Rahul"
```

```
p1.age=20
p1.city="Kolkata"
p1.display()

print()

p2=Person()
p2.name="Karan"
p2.age=22
p2.city="Bangalore"
p2.display()

print()
p1.display()
```

In the above implementation, p1=Person() is the object instantiation. p1 is the name of the object . We accessed the properties of the class through object p1 and gave them different values and later called the display function to display values of this object.Later,we do the same for second object p2 and display properties of p2.

At the end, we again call display() for object p1 to show that each object holds its own value of properties and those are independent of the other objects.

Output

```
Name : Rahul
Age : 20
City : Kolkata
Name : Karan
Age : 22
City : Bangalore
Name : Rahul
Age : 20
City : Kolkata
```