Module 1: Design Goals, Architecture and Installation

Assignment Solution

edureka!

Version 2.0

1. Write a JSON document which can have all data types supported by JSON?

Ans.

```
{
        employee_id:50002,
        name:
                {
                F_name:'Narendra',
                M_Name:' ',
                L_Name:'Shukla',
                Nickname: 'Mark',
                alias:'',
                male:true,
                desc:null
                },
        Email:[
                {
                Official: 'narendra@edureka.in',
                Personal:       'narendra@xyz.com',
                optional:       'narendra@yahoo.com',
                others:         '  xyz@edureka.in'
                }
            ],
        phone_number:[
                {
                official: 9739205326,
                personal:       1111111111,
                optional:       2222222222
                }
                    ],
        Job:[
                {
                Job_id: 'A3',
                Job_title:'Architect',
                Min_salary:1800000,
                Max_salary:2500000
                },
                {
                Start_date:new Date('Sep 04, 2013'),
                End_date: new Date('Mar 04, 2014')
                }
           ],
        Salary:2000000,
        commission_pct:0,
        manager_id:'101',
        Department:
                {
                department_id:10,
                Department_Name:'Software',
                Manager_id:101,
```

```
                Location:
                        {
                        location_id:'CA',
                        Street_address: "Jamiya Road",
                        Postal_Code:560062,
                        State_province:'California',
                        district:null,
                        Country:
                                {
                                country_id:00001,
                                Country_name:'US',
                                Region:
                                        {
                                        Region_id:1,
                                        Region_name:'South East Region'
                                        }
                                }
                        }
                }
}
```



```
db.test12.insert({
        employee_id:50002,
        name:
                {
                F_name:'Narendra',
                M_Name:' ',
                L_Name:'Shukla',
                Nickname: 'Mark',
                alias:'',
                male:true,
                desc:null
                },
        Email:[
                {
                Official: 'narendra@edureka.in',
                Personal:       'narendra@xyz.com',
                optional:       'narendra@yahoo.com',
                others:         '  xyz@edureka.in'
                }
            ],
        phone_number:[
                {
                official: 9739205326,
                personal:       1111111111,
                optional:       2222222222
```

```
                }
                    ],
            Job:[
                {
                Job_id: 'A3',
                Job_title:'Architect',
                Min_salary:1800000,
                Max_salary:2500000
                },
                {
                Start_date:new Date('Sep 04, 2013'),
                End_date: new Date('Mar 04, 2014')
                }
            ],
            Salary:2000000,
            commission_pct:0,
            manager_id:'101',
            Department:
                {
                department_id:10,
                Department_Name:'Software',
                Manager_id:101,
                Location:
                                {
                                location_id:'CA',
                                Street_address: "Jamiya Road",
                                Postal_Code:560062,
                                State_province:'California',
                                district:null,
                                Country:
                                        {
                                        country_id:00001,
                                        Country_name:'US',
                                        Region:
                                                {
                                                Region_id:1,
                                                Region_name:'South East Region'
                                                }
                                        }
                                }
                }
})
```

2. What are the core differences between MongoDB, Hadoop, HBase and Cassandra?

Ans.

MongoDB	Hadoop	HBase	Cassandra
Database Software	Framework for processing huge data	Database Software	Database Software
Document Oriented Database	Framework	Columnar Database	Columnar Database
No prerequisite is required to install. Can be installed on any supported OS.	Java/Supported linux OS is required to install.	Hadoop/Java is required to install.	Java is required to install.
Developed by 10gen	Developed by Apache	Developed by Apache	Developed by Apache
Master Slave/ Replica set Architecture	Master Slave Architecture	Master Slave Architecture	Peer to peer Architecture

3. How can you define Horizontal and Vertical Scalability?

Ans. **Horizontal Scalability**
If we wanted to increase the performance of a cluster of machine by adding more machine to it then it's termed as horizontal scaling. Horizontal scaling, or scale out, usually refers to tying multiple independent computers together to provide more processing power. Horizontal scaling typically implies multiple instances of operating systems, residing on separate machine or servers. Examples for horizontal scaling are Cassandra, MongoDB, HBase etc.

Vertical Scalability
If we wanted to increase the performance of a Single Server adding more resources to it then it is termed as vertical scaling. Vertical scaling is also described as scale up, mainly refers to adding more processors and storage to a Symmetric Multiple Processing to extend processing capability. Generally, this form of scaling employs only one instance of the operating system.
Example for vertical scaling is MySQL - Amazon RDS (The cloud version of MySQL) provides an easy way to scale vertically by switching from smaller to bigger machine this process often involves downtime.

4. Can we design a Social Media App with MongoDB, if yes then how?

Ans. Yes, we can design a Social Media App with MongoDB using hierarchical tree structure for networking.

5. To design a content management system what are the databases that can be used and why?

Ans. To design a database for CMS we can use various databases like Oracle, SQl Server, MySQL etc., but Document oriented NoSQL databases e.g. MongoDB, CouchDB, couchbase etc are most powerful databases to develop content management system due to its flexible schema support, capable to handle structure, semi-structure and unstructured data, also it uses JSON data structure which is light weight text interchange and have more readable format.

6. I want to create a solution for Data Hub and I have choice of MySQL, Hadoop, Cassandra, MongoDB, HBase, which one is more suitable and why?

Ans. All big data technologies can be used in terms of scalability. Since the data is stored in JSON format handling will be easy in terms of MongoDB.

7. What is Online & Offline Big Data?

Ans. Real time data which gets created, generated or ingested with parameters like velocity, variety and volume is called Online Big Data or online data. It supports real-time to support operational applications and their users. Big Data gets generated in most of the online transactions. Examples of online Big Data databases include MongoDB, HBase, Cassandra and other NoSQL databases.

Offline Big Data encompasses applications that ingest, transform, manage and/or analyze Big Data in a batch context. They typically do not create new data. For these applications, response time can be slow (up to hours or days), which is often acceptable for this type of use case. Examples of offline Big Data applications include Hadoop-based workloads; modern data warehouses; extract, transform, load (ETL) applications; and business intelligence tools.

8. What is Agility, What is tailored and elastic?

Ans. **Agility**
Agile software development is a method of development with iterative and incremental development, in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams. It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change. It is a conceptual framework that promotes foreseen tight iterations throughout the development cycle.
Tailored and Elasticity
Tailored is made for a purpose with less capacity to accommodate changes on the other hand elasticity is generic which can accommodate changes easily.