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- CSE414 Databases -

Assignment 2

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① Write a trigger that increase (10%) salary of your employees in your company and show salary difference of employees after the salary increment. The employee table details are given as follows:

Employee (name, payment, empid)

```
CREATE TRIGGER UPDATE_SALARY
AFTER INSERT ON Employee
FOR EACH ROW
UPDATE Employee
WHEN (NEW.ID > 0)
DECLARE SALARY_DIFFERENCE NUMBER
BEGIN
SALARY_DIFFERENCE = NEW.payment - OLD.payment
DBMS_PUTLINE (NEW.payment)
DBMS_PUTLINE (OLD.payment)
DBMS_PUTLINE (SALARY_DIFFERENCE)
END;
```

(2) Write a trigger that maintains referential integrity for on delete cascade. Using the trigger, when a department is deleted, the employees on that department also have to delete. The details of the tables are given below:

Employee (Name, Age, Address, Depid)

Department (Depid, Depname)

```
CREATE TRIGGER DELETE_DEPARTMENT
AFTER DELETE ON Department
FOR EACH ROW
BEGIN
DELETE FROM Employee WHERE Employee.Depid = OLD.Depid
END;
```

(3) What are the advantages and disadvantages of using NoSQL databases? Explain each of them.

NoSQL databases are non-relational databases. Non-relational means table-less.

Advantages:

- NoSQL databases are low cost: It is a open-source database.
- Data storage is optimized for huge data: It can handle large volumes of data at high speed.
- Easy to implement due to open source. So easy to distribute.
- Performance is high because of the optimizations.
- It is flexible: It can store and combine any type of data unlike relational databases because relational can store data in a structured way.
- It is scalable: NoSQL can scale to satisfy any type of data growth.

Disadvantages:

- Consistency: In NoSQL databases if you enter same set of data again, it will take it without issuing any error
- Backup of database: There are no backup tools.
- No standardization: There are no standardization rules and roles in NoSQL.
- Interfaces need fixing because they are not user friendly.
- Poor usability: NoSQL have not really useful management tools.
- No cross-platform support: They can not run on other than Linux OS.

(4) Give characteristics of blockchain databases. Explain each of them characteristic. What are the differences between blockchain databases and traditional databases?

∝ Blockchain databases are just like databases but are structurally and functionally different. While databases store data using table data structures, blockchains store data in blocks.

Characteristics of blockchain databases:

- Distributed: meaning that many parties hold copies of the database.
- Decentralized: No single person or group has control on databases.
- Cryptological secure: Since blockchain use advanced cryptographic technology and a distributed decentralized network, they offer a secure environment.

Differences between blockchain databases and traditional databases:

- Blockchains are harder to implement and maintain but traditional databases are easy to implement and maintain.
- Blockchain uses a distributed ledger network architecture but traditional databases utilize a client-server architecture.
- Blockchain has only insert operations but traditional databases can perform insert/read/update/delete operations too.
- In blockchain anybody can validate transactions across the network but in traditional databases there are integrity constraints.
- Blockchain databases have cryptographic verification and authentication but traditional databases don't have, may be added after.

(5) What are the advantages and disadvantages of using a graph database? What are the characteristics of Neo4J graph database?

Advantages of using a graph database:

- Powerful data model.
- Flexible
- It has huge range of data model
- Easy to query.

Disadvantages of using a graph database:

- Not having standard query language.
- Difficult to scale
- Difficult in maintenance

* Neo4J (Network Exploration and Optimization 4 Java), is a graph database management system.

Characteristics of Neo4J graph database:

- It uses simple and powerful data model.
- It is SQL like so easy to write query.
- Neo4J supports full ACID properties (Atomicity, Consistency, Isolation, Durability.)
- It contains user interface (UI)
- It provides data safety and reliability.
- It supports two kind of Java API: Cypher API and Native Java API.
- It supports exporting queries.