Java Programming Assignment

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Q1.In programming, the terms "parameter" and "argument"

are often used in the context of functions or methods.

They refer to different concepts:

Parameter:

A parameter is a variable or placeholder that is defined as

part of a function or method signature.

Parameters act as placeholders for values that will be passed into

the function when it is called.

They are used to specify what kind of data a function expects and

how it should operate on that data.

Parameters are typically listed in the function's definition

and serve as the input to the function.

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Argument:

An argument is the actual value or expression that

is passed into a function or method when it is called.

Arguments are the concrete values that are substituted for

the parameters in the function's execution.

They provide the data that the function will operate on.

Q2.

Restricting user to enter more or less chacracters it should be numbers only

import java.util.Scanner;

public class NumberInputValidation {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter a number (up to 5 digits): ");

String input = scanner.nextLine();

if (input.matches("\\d{1,5}")) {

// Input is valid, and it contains between 1 and 5 digits.

int number = Integer.parseInt(input);

System.out.println("You entered a valid number: " + number);

} else {

// Input is invalid (either not a number or not within the desired range).

System.out.println("Invalid input. Please enter a number with 1 to 5 digits.");

}

scanner.close();

}

}

Q3.SQL (Structured Query Language) and NoSQL (Not Only SQL) are two different types of database management systems that are used for storing and retrieving data. They have distinct characteristics and use cases. Here's a differentiation between SQL and NoSQL databases with examples:

SQL (Relational Databases):

Structured Data: SQL databases are designed to handle structured data. They use tables with predefined schemas to organize and store data.

Schema: SQL databases require a fixed schema, meaning you need to define the structure of your data before inserting it. All rows in a table must adhere to this schema.

ACID Properties: SQL databases typically follow ACID (Atomicity, Consistency, Isolation, Durability) properties, which ensure data consistency and reliability. This makes them suitable for applications where data integrity is critical, such as financial systems.

Scalability: SQL databases can scale vertically (by adding more powerful hardware) or horizontally (by replicating data across multiple servers). However, horizontal scaling can be complex.

Examples: Popular SQL databases include MySQL, PostgreSQL, Oracle, and Microsoft SQL Server.

NoSQL (Non-Relational Databases):

Flexible Schema: NoSQL databases are designed to handle unstructured or semi-structured data. They allow for flexible schemas, which means each record in a collection can have a different structure.

No Fixed Schema: There is no need to define a fixed schema in advance. New fields can be added to records as needed, making NoSQL databases suitable for applications with evolving data requirements.

BASE Properties: NoSQL databases often follow the BASE (Basically Available, Soft state, Eventually consistent) model, which prioritizes availability and performance over strong consistency. This makes them suitable for applications with high read/write loads, such as social media platforms.

Scalability: NoSQL databases are well-suited for horizontal scalability. They can easily distribute data across multiple nodes or clusters.

Examples: Common NoSQL databases include MongoDB (document-based), Cassandra (column-family), Redis (key-value), and Neo4j (graph).

Examples of SQL vs. NoSQL:

E-commerce Application:

SQL: Storing customer data, order history,

and inventory management with fixed schemas.

NoSQL: Storing user-generated product reviews

with variable attributes and high read/write rates.

Social Media Platform:

SQL: Managing user profiles, friend relationships,

and private messages with strict data consistency requirements.

NoSQL: Storing user-generated content like posts, comments,

and likes with eventual consistency.

IoT Data Storage:

SQL: Recording sensor data with a predefined schema and complex queries.

NoSQL: Handling real-time sensor data with variable

data structures and high scalability.

Q4.The execute method is often associated with database operations,

specifically when using JDBC (Java Database Connectivity) to interact

with relational databases. This method is used to execute SQL statements,

such as SELECT, INSERT, UPDATE, or DELETE, on a database.

The return value of the execute method depends on the type of SQL statement

being executed and the specific method being used (there are multiple execute methods with different signatures).

Here's a general explanation of when it might return true or false:

executeQuery Method (Returns true or false):

This method is typically used to execute SELECT statements

that retrieve data from the database.

It returns true if the query resulted in a ResultSet object,

which means the statement was a SELECT query, and there

is a result set to be processed.

It returns false if the statement does not return a result set,

such as for INSERT, UPDATE, DELETE, or DDL (Data Definition Language) statements.

Content Management System (CMS):

SQL: Storing structured content data like articles, pages, and categories.

NoSQL: Managing user-generated content, metadata, and multimedia assets.