HOMEWORK#6

1 – What is the difference between manual testing and automated testing?

Because of using human resources to perform testing. The skills, knowledge, and experience of the testers play an important role in Manual Testing. Usage of automation tools for executing test cases is known as Automation Testing. It is a type of testing for which we need resources with the knowledge of scripting, etc. Selenium, QTP, UFT are some examples of automation tools.

2 – What does Assert class do?

Assert is a method useful in determining Pass or Fail status of a test case, The assert methods are provided by the class org.junit.Assert which extends java.lang.Object class. There are various types of assertions like Boolean, Null, Identical etc.

3 - How can be tested 'private' methods?

Generally private methods don't unit tested directly. Since they are private, consider them an implementation detail. To test private methods, you just need to test the public methods that call them. Call your public method and make assertions about the result or the state of the object. If the tests pass, you know your private methods are working correctly.

4 – What is Monolithic Architecture?

If all the functionalities of a project exists in a single codebase, then that application is known as monolithic application. “mono” represents the single codebase containing all the required functionalities.

5 - What are the best practices to write a Unit Test Case?

These unit testing best practices help streamline and structure tests for maximum efficiency and accuracy:

- One Assertion in One Test Method
- Minimize Test Interdependence
- Automate Unit Tests
- Use a Consistent Naming Convention
- Ensure tests are deterministic
- Avoid Logic in Tests
- Write tests during development, not after it
- Use real browsers and devices.

6 - Why does JUnit only report the first failure in a single test?

Reporting multiple failures in a single test is generally a sign that the test does too much and it is too big a unit test. JUnit is designed to work best with a number of small tests. It executes each test within a separate instance of the test class.

7 - What are the benefits and drawbacks of Microservices?

Advantages of Microservices:

- Microservices are self-contained, independent deployment module.
- The cost of scaling is comparatively less than the monolithic architecture.
- It is possible to change or upgrade each service individually rather than upgrading in the entire application.
- Microservices follows the single responsibility principle.
- Less dependency and easy to test.
- Dynamic scaling.
- Faster release cycle.

Disadvantages of Microservices:

- Microservices has all the associated complexities of the distributed system.
- There is a higher chance of failure during communication between different services.
- Difficult to manage a large number of services.

8 - What is the role of actuator in spring boot?

Actuator is mainly used to expose operational information about the running application .health, metrics, info, dump, env, etc. It uses HTTP endpoints or JMX beans to enable us to interact with it.

9 - What are the challenges that one has to face while using Microservices?

10 - How independent microservices communicate with each other?

Some of the ways in which services can communicate in a microservices architecture:

- **HTTP communication:** HTTP calls between services is a feasible approach for service-to-service communication.
- **Message communication:** The participating services do not communicate directly with each other. The services push messages via message broker in order to reach out to other services.
- **Event-driven communication:** An event-driven pattern is another asynchronous approach where coupling between services is completely removed.

11 - What do you mean by Domain driven design?

Domain Driven Design (DDD) is a software development approach that deeply connects the ever-changing fundamental business rules in a world of complex requirements. Capture the domain model, in domain terms, through interactions with domain experts. Then, Embed the domain terminology in the code. And then, Protect the domain knowledge from corruption by other domains, technical subdomains, etc.

12 – What is container in Microservices?

Containers are a lightweight alternative to VMs for providing isolated operating environments for your workloads. They use a different method of abstracting resources. to better performance and a lower infrastructure footprint, containerized microservices are typically more robust than a traditional monolithic application.

13 - What are the main components of Microservices architecture?

A microservices architecture as the name implies is a complex coalition of code, databases, application functions and programming logic spread across servers and platforms.

- Microservices
- Containers
- Service mesh
- Service discovery
- API gateway

14 - How does a Microservice architecture work?

Microservices architecture focuses on classifying the otherwise large, bulky applications. Each microservice is designed to address an application's particular aspect and function, such as logging, data search, and more. Multiple such microservices come together to form one efficient application. This intuitive, functional division of an application offers several benefits. The client can use the user interface to generate requests. At the same time, one or more microservices are commissioned through the API gateway to perform the requested task. As a result, even larger complex problems that require a combination of microservices can be solved relatively easily.