PATİKA.DEV & PAYCORE JAVA SPRING BOOTCAMP HOMEWORK 6

Zeynel Acar

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

In manual testing test cases are executed manually by a developer, tester etc. without support from tools and scripts. In automated testing tests are executed with the help of tools, scripts and softwares. In general, automated testing considered more reliable and faster. However manual testing allows for human observation therefor in the need of user friendliness and customer experience would be more preferred.

2 – What does Assert class ?

It is class that exists of assertion methods that useful for writing tests. Only failed assertions are recorded. These methods can be used directly. They are provided by org.junit.Assert. With assert methods a developer or tester can check for equality, failure , trueness and other various aspects.

3 - How can be tested 'private' methods ?

As far as I gather up from various sources, you should not test private methods. But if anyone wants to do it, there are multiple approaches, one of them is giving methods package access. Another one is nested test class, however this would result in mixing of production code and testing code. Therefor might not be so preferable. Third approach would be using reflection, by this method you would solve the issue of separation of testing code and production code. In this method only probable problem would be related with IDEs and their configurations.

4 – What is Monolithic Architecture ?

Monolithic applications are designed for multiple tasking. Especially complex applications that has tightly coupled functions. Applications with monolithic architecture tend to have huge code bases, a small change in one part of the apllication can create necessity to change other parts of the application as well.

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

Like there are best practices to write a production code, there are also best practices to write unit tests. Can be listed as :

- *Adopt a well-organized test practice,*
- *Name your tests well,*
- *Write reliable and trustworthy unit tests,*
- *Automate your testing as much as possible,*
- *Focus on single use-case at a time,*
- *Minimal assertion per test,*
- *Unit tests should be isolated,*
- *Aim for as much as code coverage.*

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

In the case of multiple failures in a single test can show the test does too much and too big for a unit test. Junit is designed for small tests. Junit executes each test within a separate instance of the test class, and reports failure on each test.

7 - What are the benefits and drawbacks of Microservices ?

Microservices follow the SOA design principles. As follows:

- *Standardized service contract*
- *Loose coupling*
- *Service abstraction*
- *Service reusability*
- *Service autonomy*
- *Service statelessness*
- *Service discoverability*
- *Service composability*

In general, benefits of using microservices are: Greater agility, faster time to market, better scalability, faster development cycles, easier to create CI/CD pipeline for single-responsibility services, Isolated services have better fault tolerance, platform and language agnostic services.

Drawbacks of using microservices are: Needs more collaboration, harder to test and monitor, poorer performance, harder to maintain the network, more suitable for corporate culture, might cause some security issues.

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

Actuator is used for monitoring our app, gathering metrics, understanding traffic, or the state of our database. It is mainly used to expose operational information about the running application.When this dependency is added to classpath, several endpoints becomes available.

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

The challenges of microservices can be listed as design, security, testing, operational complexities, and communication. Therefore unclear domains for the project, or projects with low efficiency would not be ideal to use microservices.

10 - How independent microservices communicate with each other?

Microservice architecture is distributed architecture, communications between the microservices executed with inter-service communication at network level. Microservices has their own instance and process. Therefore services must interact using an inter-service protocol like http,gRPC, message brokers AMQP. Communication types also can be synchronous or asynchronous.

11 - What do you mean by Domain driven design ?

It is a software design approach focusing on modelling software to match a domain. It has the goals of placing the primary focus on the core domain, basing complex designs on a model of domain, initiating a creative collaboration between technical and domain experts to iteratively refine a conceptual model that addresses particular domain problems.

12 – What is container in Microservices ?

Containers are a form of operation system virtualization. Single container can be used for running a small microservice to a software process of a larger application. Container contains all the necessary executables , binary code, libraries, and configuration files. However , when compared to servers they do not contain operation system images. This makes them more lightweight and portable.

13 - What are the main components of Microservices architecture ?

In general, it is considered that there are 5 main components of microservices architecture, at first *microservices* as it can be understood from the microservices are the foundation of this architecture. Then there comes the *container*, it is necessary for deployment and running, third step is *service mesh*, it abstracts the communication layer. And to go further you need *service discovery*, it is made up of three parts a service provider, a service registry, a service consumer. There is a client-side discovery pattern and a server-side discovery pattern. And the last stage is *API gateway*, it would handle a large sum of communication and they create the main layer of abstraction between microservices and outside clients.

14 - How does a Microservice architecture work?

Microservices attempt to address a single concern, such as a data search, logging function, or web service function. This approach increases flexibility—for example, updating the code of a single function without having to refactor or even redeploy the rest of the microservices architecture. With the management of the microservices with the help of other components.