HW#6 – Baran AYDIN

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

Manual Testing is done manually by QA analyst (Human) whereas Automation Testing is done with the use of script, code and automation tools (computer) by a tester.

Manual Testing process is not accurate because of the possibilities of human errors whereas the Automation process is reliable because it is code and script based.

Manual Testing is a time-consuming process whereas Automation Testing is very fast.

Manual Testing is possible without programming knowledge whereas Automation Testing is not possible without programming knowledge.

Manual Testing allows random Testing whereas Automation Testing doesn't allow random Testing.

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2 – What does Assert class ?

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.

Junit provides a class named Assert, which provides a bunch of assertion methods useful in writing test cases and to detect test failure

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3 - How can be tested 'private' methods ?

There are many ways to test private methods in java.
Just call it : in Java we need to change visibility of the method.
Nested class : We can put a test class inside a tested one, however this is not suggested way. We have to use the same file for both classes, and our production binaries will actually contain test code.
Reflection : This allows change access modifiers in runtime
Eliminate Private: By using @VisibleForTesting annotation we can test private methods.

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4 – What is Monolithic Architecture ?

A monolithic application describes a single-tiered software application in which the user interface and data access code are combined into a single program from a single platform. A monolithic application is self-contained and independent from other computing applications.

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

Adopt a well-organized test practice.
Name your test well.
Write reliable and trustworthy unit tests.
Make automated unit testing a rule.
Focus on single use-case at a time.
Minimal assertion per test.
Unit test should be isolated.
Truly unit, not integration.
Aim for 100% code coverage.
Start using headless testing in the cloud.

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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. It reports failure on each test.

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7 - What are the benefits and drawbacks of Microservices ?

Advantages:

Microservices are self-contained, independent deployment module.
The cost of scaling is comparatively less than the monolithic architecture.
Microservices are independently manageable services. It can enable more and more services as the need arises. It minimizes the impact on existing service.
It is possible to change or upgrade each service individually rather than upgrading in the entire application.
Microservices allows us to develop an application which is organic (an application which latterly upgrades by adding more functions or modules) in nature.
It enables event streaming technology to enable easy integration in comparison to heavyweight interposes communication.
Microservices follows the single responsibility principle.
The demanding service can be deployed on multiple servers to enhance performance.
Less dependency and easy to test.
Dynamic scaling.
Faster release cycle.

Disadvantages:

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.
The developer needs to solve the problem, such as network latency and load balancing.
Complex testing over a distributed environment.

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

Actuator is mainly used to expose operational information about the running application. Such as health, metrics, info, dump, env, etc. It uses HTTP endpoints or JMX beans to enable us to interact with it. Once this dependency is on the classpath, several endpoints are available for us out of the box

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

Design, Security, Testing, Increased operational complexity, Communication.

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10 - How independent microservices communicate with each other?

Since microservices are distributed, microservices communicate with each other by inter-service communication on network level. Each microservice has its own instance and process. Therefore, services must interact using an inter-service communication protocols like HTTP, gRPC or message brokers AMQP protocol

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11 - What do you mean by Domain driven design ?

Domain-driven design is a software design approach focusing on modelling software to match a domain according to input from that domain's experts. In terms of object-oriented programming it means that the structure and language of software code should match the business domain.

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12 – What is container in Microservices ?

Containers are a form of operating system virtualization. A single container might be used to run anything from a small microservice or software process to a larger application. Inside a container are all the necessary executables, binary code, libraries, and configuration files.

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13 - What are the main components of Microservices architecture ?

Clients, Identity Providers, API Gateway, Messaging Formats, Databases, Static Content, Management, Service Discovery

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14 - How does a Microservice architecture work?

API Gateway: Clients need API Gateway as it is an entry point, which forwards the call to the specific services on the back end. Here API gateway helps in collecting the responses from different services and returns the response to the client.

Microservices: As the name itself suggests that microservices are the services that help in dividing the service into small services that perform a certain business capability like user registration, current orders, or wish list.

Database: Microservices can either share the same database or an independent database.

Inter-microservices communication: REST or Messaging are the protocol to interact with each other.