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|  | **BAHRIA UNIVERSITY, (Karachi Campus)**  *Department of Software Engineering*  **Assignment 3 - Spring 2023** |  |



COURSE TITLE: **SOFTWARE QUALITY ENGINEERING** COURSE CODE: **SEN-321**

Class: **BSE-6 (B)** Shift: **Morning**

Course Instructor: Sohaib ur RehmanTime Allowed:  **1 Week**

Submission Date: **11th June 2023** Max. Marks: **5 Marks**

**Question No. 1 [CLO3: 5 Marks]**

Assignment Title: Quality Assurance (QA) in Microservices Architecture

Assignment Description:

In this assignment, you will explore the challenges and best practices related to Quality Assurance (QA) in a microservices architecture. Your task is to develop a comprehensive testing strategy specifically tailored for a microservices-based application. You will identify key testing aspects, propose suitable testing techniques, and outline the necessary steps to ensure the quality and reliability of the system.

Assignment Guidelines:

Scenario: Imagine you are a QA engineer working on a project that involves developing a microservices-based e-commerce platform. The platform consists of various services, such as product catalog, user management, order processing, and payment gateway.

Testing Strategy: Develop a testing strategy that addresses the unique characteristics of a microservices architecture. Consider the following aspects:

a. Service Isolation: How will you ensure that each service is tested independently and thoroughly?

b. Integration Testing: What approach will you take to verify the communication and collaboration between different services?

c. Contract Testing: How will you ensure that the API contracts between services are respected and validated?

d. Performance Testing: What techniques will you employ to test the performance and scalability of individual services and the overall system?

e. Fault Injection Testing: How will you simulate and test various failure scenarios to ensure system resilience?

f. Deployment and Rollback Testing: What steps will you follow to test the deployment and rollback procedures in a dynamic microservices environment?

g. Monitoring and Observability: How will you establish monitoring and observability mechanisms to track service behavior and detect anomalies?

h. Security Testing: What measures will you take to ensure the security and compliance of the microservices and the entire system?

Test Automation: Discuss the importance of test automation in a microservices architecture and propose suitable automation frameworks or tools that can support efficient testing processes.

Documentation: Create a document outlining your testing strategy, including the key aspects mentioned above. Clearly explain each testing approach, techniques, and tools you would use, and provide justifications for your choices.

**Evaluation Criteria:**

Your assignment will be evaluated based on the following criteria:

1. Thoroughness of defect identification, considering various aspects of the mobile banking application.
2. Accuracy and relevance of defect categorization, demonstrating a comprehensive understanding of different defect types.
3. Effectiveness and feasibility of proposed solutions, addressing the identified defects and improving the application's quality.
4. Clarity and coherence of justifications, providing solid reasoning for each proposed solution.

**Submission Requirements:**

Use reputable sources to research and support your answers and mentioned all references.

Your answers should be clear, concise, and free of errors.

Your assignment should be properly formatted with headings, subheadings, and lists where appropriate.

Your assignment should be 3-5 pages in length, double-spaced with 12 pt font size.

Submit a hard copy before 15 June 2023.