**Assignment – 2**

**Write a brief summary of any 5 software testing styles.**

Software testing is the process of evaluating a software application or system to ensure it meets requirements, identifies bugs, and maintains quality.

1. **Unit testing**:

Unit Testing is a software testing method where individual components or modules of an application are tested in isolation to verify they function correctly. It focuses on testing the smallest testable units of code, like functions or methods, to ensure they behave as expected independently of other parts of the application.

Key aspects of unit testing:

* Focus on isolated units:

Each unit is tested in isolation, meaning it's not interacting with the rest of the application.

* Early defect detection:

Unit tests help identify bugs early in the development process, which can be more cost-effective to fix than later in the software testing lifecycle.

* Improved code quality:

By ensuring each unit works correctly, unit tests contribute to a more reliable and maintainable codebase.

1. **Integration testing:**

Integration testing is a type of software testing where individual units or modules of a software application are combined and tested as a whole to ensure they work together correctly. It focuses on verifying the interactions and interfaces between these integrated components.

Various methods can be used, including:

* Incremental integration testing: Combining modules in a step-by-step manner.
* Big bang integration testing: Combining all modules at once.
* Top-down, bottom-up, and sandwich approaches: These methods vary in how they organize the integration process.

Example:

* Healthcare information system:

Testing how an electronic medical record system interacts with a laboratory information system to ensure data is shared correctly.

1. **Functional Testing:**

Functional testing is a type of software testing that verifies whether a software application's features work as expected based on the specified requirements. It focuses on the "what" of the software, ensuring that it performs its intended functions correctly, like adding items to a cart, processing payments, or sending emails. This type of testing is crucial for ensuring that the software meets the needs of the end-users and adheres to the business requirements.

Key aspects of Functional Testing:

* Focus on Functionality:

Functional testing specifically checks if each function of the application works according to the defined requirements.

* Verification of Outputs:

The testing process involves providing inputs to the system, observing the outputs, and verifying that the actual outputs match the expected outputs.

1. **Performance Testing:**

Performance testing is a software testing method that assesses how well a system, application, or API behaves under various conditions, especially under load. It evaluates speed, stability, responsiveness, and scalability to ensure the system meets its performance requirements and can handle expected workloads.

Key aspects of performance testing:

* Purpose:

To identify and address performance bottlenecks and ensure the system meets its performance requirements.

* Scope:

Can include various types of testing, such as load testing, stress testing, endurance testing, and spike testing.

* Benefits:

Helps to improve the overall quality, stability, and user experience of the system.

1. **API testing**:

API Testing is a type of software testing that focuses on verifying the functionality, reliability, performance, and security of Application Programming Interfaces (APIs). APIs act as intermediaries between different software systems, enabling them to communicate and exchange data. API testing is crucial because it ensures that APIs operate as intended, handle data correctly, and maintain security and performance standards.

API testing involves verifying the functionality, reliability, performance, and security of an Application Programming Interface (API) by sending requests and analyzing the responses. It's a crucial aspect of software testing that ensures APIs operate correctly and securely.