Software Testing and Quality Assurance.

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Assignment - 1

1) What are the major types of software testing? Give Examples.

=> Software testing is the process of finding defects in the software.

Major types of software testing.

① Black box testing :- Tests the functionality of the software without looking at the internal code structure (Tester).

Ex: Testing a login page by inputing valid & invalid credentials without knowing backend logic.

② White Box testing :- Tests the internal code structure and logic of the software (Developer)

Ex: Testing each branch of an if-else in a function.

③ Unit testing :- Tests individual units or components of the software to ensure they function as intended.

Ex: Testing a function that sums prices in a shopping cart.

(4) Integration testing:- Tests the integration of diff. components of software to ensure they work together as a system.

Ex:- Testing how a login module connects with user database.

(5) Functional testing:- Tests the functional requirements of the software to ensure they are met.

Ex:- Testing a bank's money transfer feature to verify correct amount is debited and credited.

(6) Regression testing:- Tests the software after changes or modifications to ensure no new defects are introduced.

Ex:- After adding a new payment gateway testers recheck login, startup & checkout to ensure nothing broke.

(7) Performance testing:- Tests the software to determine its performance characteristics such as speed, scalability and stability.

Ex:- Checking how an e-commerce website handles 10,000 users browsing & purchasing products simultaneously.

2. What are the different types of Revision Factor Testing classes?

=>. Revision factor testing is a process designed to verify that any changes made to the software - whether through bug fixes, enhancements or adaptations - do not negatively affect the existing functionality.

→ It evaluates the revision factor or the impact that these changes have on software's behaviour.

Types of Revision factor testing classes.

→ Corrective testing:-

→ Test bug fixes to ensure that the corrections resolve the issue without disrupting other features.

Example:- After fixing a bug in user authentication verify that users can still log in and that related features remain unaffected.

→ Adaptive testing.

→ Ensures that the software functions correctly when moved to or operating in a new environment.

Example:- A desktop application developed for win 10 is tested on win 11 to verify compatibility.

→ Perspective testing :-

→ Validate enhancements and performance improvements to confirm that they meet the intended improvements without negative side effects.

Example :- An updated search engine promises faster results. Testing ensures that while the response time has improved, the accuracy and relevance of search results are not compromised.

→ Regression Testing :-

→ Confirm that recent changes have not disrupted existing functionality in parts of software that were previously working correctly.

Example :-

After integrating a new dark mode feature the tests are run on existing features like login, notifications etc. to ensure they continue to function properly.

3. What is the difference between Black box testing and whitebox testing in terms of implementation and visibility?

⇒ Blackbox testing :- It is a testing method where the tester evaluates the functionalities of an application without looking into internal code.

whitebox testing :- It is a testing technique where the internal code, logic and structure of the application are tested.

Difference b/w BBT and WBT in terms of ~~implementation.~~ visibility.

Aspect	~~BBT~~ BBT	WBT
code access.	No access to the internal code.	Full access to the internal code.
Focus.	Focuses on functionality and output.	Focuses on internal logic and structure.
Tester role.	Treated as end user.	Requires the programming knowledge.
Knowledge Needed.	Does not require programming knowledge.	Treated as a developer or with developer insight

Differences b/w BBT and WBT in terms of Implementation.

Aspect	BBT	WBT
Test cases Based on	Requirements and Specification	Code logic, paths and structure.
Tools	Selenium, Postman, TestRail	JUnit, NUnit, PyTest
Common Techniques	Equivalence partitioning boundary value analysis	statement coverage, branch coverage, path testing.
level of Testing.	Mainly used for higher levels	Mainly used for lower levels.
Maintenance	Easier to maintain as UI/spec changes	Harder to maintain as code changes affect tests.

What is Software Qualification Testing. and what are its Different types?

⇒ Software Qualification Testing ensures that software meets specified requirements and is ready for deployment.

→ It validates whether the software perform correctly under different conditions.

→ Confirms the software meets the business and technical requirements.

Types of Software Qualification testing.

1. Installation Qualification. (IQ)

→ Verifies that the software is installed correctly in its intended environment.

Example:- checking whether ERP system is properly installed with the required database and dependencies before use.

2. Operational Qualification:- (OQ)

→ Tests if the software functions correctly under standard operating conditions.

Example:- Running an ATM software system to ensure cash withdrawal and balance inquiry work correctly.

3. Performance Qualification:

→ Ensures the software performs efficiently under real-world conditions.

Example:- Testing a ride sharing app to handle 50,000 simultaneous ride requests without crashes.

(5) What is Equivalence class partitioning (ECP) in testing? Give a suitable example?

⇒ Equivalence class partitioning divides the range of input data into groups called equivalence classes. The idea is that if one test case in a group produces the correct output all other cases in that group will likely to do so.

→ It Reduces Test cases
→ Improves Efficiency
→ Identifies Boundaries.

Steps:-

1. Identify the input Domain:
   Determine all possible input values for a particular function or module.

2. Divide into Equivalence classes:-
   → Valid classes:- Groups inputs that are expected to work correctly.

→ Invalid classes:- Group all inputs that should be rejected or cause error messages.

3. Select Representative Test cases:-

Choose one (or few) values from each equivalence class to perform tests.

Example:-

Assume, we have to test a field which accepts Age 18-56

AGE [Enter Age] * Accepts values 18 to 56.

Equivalence Partitioning:

Invalid	valid	Invalid
<=17	18-56	>=57.

(6) What are the qualifications and skills needed to become an effective Software tester?

⇒

Qualifications

1. Educational Background:-

→ Bachelor's degree in Computer Science, IT or related field.

2. Certifications:-

→ ISTQB (International software testing Qualification Board)

→ CSTE (Certified Software tester)

Technical skills:

1. Understanding of SDLC & STLC
2. Testing types.
3. Test case Designs.
4. Bug tracking Tools
5. Automation Testing
6. API Testing
7. Database / SQL
8. Version control

Analytical and problem solving skills.

→ Ability to analyze requirements.
→ Think like user to find issues.

Soft skills.

1. Communication skills.
2. Attention to Detail
3. Time Management
4. Team collaboration

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