**TASK 1**

**TYPES OF TESTING:**

**What is Manual Testing?**

Manual Testing is a type of testing in which we do not use any tools to perform the testing. In this testing, testers make test case for the codes test the software, and give the final report about that software. Manual testing is time-consuming testing because humans do it and there is a chance of human errors.

* Manual testing is conducted to discover bugs in the developed software application.
* The tester checks all the essential features of the application.
* The tester executes test cases and generates test reports without any help from the automation tools.
* It is conducted by the experienced tester to accomplish the testing process.

***When to Perform Manual Testing?***

Manual testing is done when automation can't be used or isn't enough. Here are key reasons and scenarios:

* **Exploratory Testing**: Discovering issues in new or unclear features by exploring them.
* **Usability Testing**: Checking if the UI is easy to use and looks good.
* **Ad-Hoc Testing**: Doing quick, informal tests after updates or bug fixes.
* **Visual/GUI Testing**: Checking the layout, colors, or how the site looks across different browsers.

***Benefits of Manual Testing***

* **Easy hiring:**In manual testing, anyone can test so it helps in easy hiring.
* **Fast feedback:**Manual testing helps to provide fast and accurate feedback.
* **Versatile:**Manual test cases can be applied to many test cases.
* **Flexible:**Manual testing is flexible as it can adapt easily to changes in the user interface.
* **Less expensive:**Manual testing is less expensive as one does not need to spend a budget on automation tools and processes.

***Limitations of Manual Testing***

* **Not all defects detected:**In manual cases, there is no assurance that there will be 100% test coverage as a result some of the defects may not be detected.
* **High expertise:**Although manual testing can be done by anyone, in some complex cases high expertise is required.
* **Lots of time:**Manual testing times extensive activity. It requires a lot of time to manually develop test cases so that all the functionalities are covered and tested.
* **Cannot be recorded:**Manual testing process cannot be recorded so it is not possible to reuse the manual test cases.
* **Less reliable:**Manual testing is less reliable as it is conducted by humans and all test cases are designed by humans so there are chances for human error.

***What is Automation Testing?***

Automation testing is a type of testing in which we take the help of tools (automation) to perform the testing. It is faster than manual testing because it is done with some automation tools. There is no chance of any human errors.

* It relies entirely on pre-scripted test which runs automatically to compare actual results with expected results.
* Automation testing helps the tester determine whether the application performs as expected or not.
* It allows the execution of repetitive tasks and regression tests.
* Automation requires manual effort to create initial testing scripts.

***When to Perform Automation Testing?***

* **When need to run repetitive tasks:**Automated tests are the best option in scenarios where there is a requirement to run repetitive tests. For example, in the case of regression tests must be executed periodically to make sure that the newly added code does not disrupt the existing functionality of the software.
* **When human resources are scarce:**Automated tests are viable and the best option to get tests executed within deadlines when there are only a limited number of dedicated testers.

***Benefits of Automation Testing***

* **Finds more bugs:**Automation testing helps to find more bugs and defects in the software.
* **Reduce time for regression tests:**Automated tests are suitable for regression tests as the tests can be executed in a repetitive manner periodically.
* **The process can be recorded:**This is one of the benefits of using automation tests as these tests can be recorded and thus allows to reuse of the tests.
* **No fatigue:**As automation, tests are executed using software tools so there is no fatigue or tiring factor as in manual testing.
* **Increased test coverage:**Automation tests help to increase the test coverage as using the tool for testing helps to make sure that not even the smallest unit is left for testing.

***Limitations of Automation Testing***

* **Difficult to inspect visual elements:**In automated tests, it is difficult to get insight into the visual elements like color, font size, font type, button sizes, etc. as there is no human intervention.
* **High cost:**Automation tests have a high cost of implementation as tools are required for testing, thus adding the cost to the project budget.
* **Test maintenance is costly:**In automation tests, test maintenance is costly.
* **Not false proof:**Automation tests also have some limitations and mistakes in automated tests can lead to errors and omissions.
* **Trained employees required:**For conducting automated tests, trained employees with knowledge of programming languages and testing knowledge are required.

**Testing levels**

***Unit Testing***

It is a testing technique wherein the simple or smallest units of a software program are examined personally for bugs and errors. These smallest units may be examined independently and personally as they do now no longer want to communicate with every other software program module and are absolutely useful. Unit testing can also additionally require stubs and drivers. These stubs and drivers offer the statistics wished for unit testing and additionally replicate the feature calls.

***Functional Testing***

This form of testing includes testing the software program for the useful necessities which are referred to inside the software requirements specification document (SRS). It is accomplished to ensure that at a minimum the simple capabilities of a software program are running well. It is a form of black box testing and exams best the functionalities.

***Acceptance Testing***

It is the ultimate level in software program testing earlier than making the software program to be had to be used to the customer. It guarantees that the software program is in keeping with the necessities of the customer and satisfies the customer's expectations and the necessities referred to within the SRS document.

***Integration Testing***

A software program typically incorporates numerous modules and applications that undergo unit testing personally. Once the modules are examined personally, they may be included collectively to test how they interact with every different and test any errors that are termed as Integration Testing. It is likewise termed as ‘I & T’ (Integration and Testing), ‘String Testing’, and sometimes ‘Thread Testing’.

**Testing Techniques**

***1.Black Box Testing:***  
Black box testing is a type of software testing in which the functionality of the software is not known. The testing is done without the internal knowledge of the products. It is also called Functional testing. Black-box testing focuses on software’s external attributes and behavior. This type of testing looks at an application’s software's expected behavior from the user’s point of view.

***2.White Box Testing*:**  
White-box testing or glass-box testing is a software testing technique that tests the software by using the knowledge of internal data structures, physical logic flow, and architecture at the level of source code. This testing works by looking at testing from the developer’s point of view. This testing is also known as glass box testing, clear box testing, structural testing, or non-functional testing.

***3.Gray Box Testing:***  
Gray Box Testing is a combination of the Black Box Testing technique and the White Box Testing technique in software testing. The gray-box testing involves inputs and outputs of a program for the testing purpose but test design is tested by using the information about the code. Gray-box testing is well suited for web application testing because it factors in a high-level design environment and the inter-operability conditions.