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Course: **Guided Research**

**Weekly Progress Report 4**

Student: Tural Mehtiyev

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Performance testing is a type of software testing that focuses on how a system performs under a particular workload. It's not just about finding bugs or verifying that the application works correctly, like functional testing. Instead, it's about understanding the scalability of the application and identifying any bottlenecks that could impact its performance.

Here are some of the key characteristics of performance testing:

It tests the speed and effectiveness of the system under load: Performance testing measures how quickly the system responds, its robustness, reliability, and scalability under a particular workload. It can also help you identify the maximum operating capacity of an application.

It focuses on non-functional requirements: Unlike functional testing, which verifies whether the system works according to the specified functional requirements, performance testing validates the non-functional requirements such as system's speed, stability, and scalability.

It simulates concurrent users: Performance testing often involves simulating multiple users accessing the system at the same time, which isn't typically a concern in functional testing.

There are different types of performance testing, including:

Load Testing: It checks how the system behaves when multiple users access it concurrently. It helps to identify the maximum load the system can handle.

Stress Testing: It involves testing the system under extreme loads to identify the breaking point or the limit at which the system fails.

Endurance Testing: It is done to make sure the software can handle the expected load over a long period of time.

Spike Testing: This type tests the software’s reaction to sudden large spikes in the load generated by users.

Volume Testing: This is done to analyze the system performance by increasing the volume of data in the database.

The goal of performance testing is to identify any performance problems, establish a benchmark for future testing, and ensure that the system meets performance expectations.

Functional testing and performance testing are both critical parts of the software development lifecycle. While functional testing ensures that the system behaves as expected, performance testing ensures that the system can handle the expected load effectively and efficiently.