Benchmarking

What is it -

The performance, quality, or advancement of a system, product, process, or person can be measured, compared, or evaluated using a benchmark, which is a standard or point of reference. A wide range of industries, including business, education, finance, and technology, employ benchmarks extensively.

There are different types of benchmarks, this includes:

- Performance Benchmarking which measures speed, efficiency, or capability.
- Competitive Benchmarking which compares a company's performance against competitors.
- Process Benchmarking which can be used to analyse workflow to improve efficiency.
- Financial Benchmarking which compares financial metrics.
- Academic Benchmarking to assess student performance against standard tests or learning goals.

In terms of hardware a benchmark is a standardised test or series of tests used to evaluate and compare the performance of various parts of computer hardware, such as CPUs, GPUs, RAM, storage devices, and even complete systems. Benchmarks aid in assessing a hardware component's performance under various workloads. For computers we have benchmarks for CPU's, GPU's, Storage, RAM, etc.

Hardware and Software benchmark examples (3DMark, Geekbench) -

For benchmarking gaming hardware, stress-testing GPUs and CPUs with intensive 3D renderings, ray tracing simulations, and physics computations, 3DMark is the industry standard. It helps builders and gamers optimise installations by producing performance rankings that are similar across computers.

Geekbench is an expert in cross-platform processor testing, evaluating GPU compute performance (OpenCL/Metal) and single/multicore CPU speeds on Windows, Mac, Linux, and mobile devices. Its lightweight form makes it possible to compare workstations, laptops, and cell phones quickly.

Geekbench offers more comprehensive device-agnostic measurements, whereas 3DMark concentrates on graphics workloads for desktop computers. While both products provide online databases for competitive testing, Geekbench caters to developers and reviewers who want portable performance statistics, while 3DMark targets fans.

3DMark Key functionalities -

- Gaming Performance Testing
- CPU and GPU Stress Testing
- Ray Tracing Benchmark
- Storage Benchmark
- Store Comparison

Geekbench Key functionalities -

- CPU Benchmarking
- Compute Benchmark
- Cross-Platform Comparisons
- Lightweight and Quick

Why use Benchmarks -

Benchmarks should be used because they offer quantifiable, objective data to assess software and hardware performance, benchmarks are crucial tools that eliminate uncertainty from decision-making. Benchmarks provide standardised testing that show real-world capabilities, whether you're a developer optimising code, a professional choosing a workstation, or a gamer evaluating GPUs. They guarantee you receive the highest return on your investment, validate manufacturer claims, and assist in locating system bottlenecks. Benchmarks help firms design their infrastructure by forecasting how hardware will manage workloads. They are used by hobbyists and overlockers to verify stability after pushing parts over their factory limits. When deciding between gadgets like computers or cell phones, even casual consumers get advantages. Through the translation of technical specs into comparable scores, benchmarks provide the possibility of making informed choices tailored to your needs.