Operating System Project

# CPU & OS Benchmarking tool using JAVA

**Introduction**

It is for sure that there is a significant performance difference between Windows, linux and mac for common build tasks, the same can be noticed in the RISC devices specifically smartphones.

Surely there must be hidden differences in the operating systems that contribute to this significant performance difference.

To get accurate test results, we have chosen some typical core primitives of operating systems. This include:

* Process and thread creation
* Memory allocation
* File creation
* Entering data into the files
* Compilation time of java files

The aim of this project will be to measure performance difference in various operating systems and system configuration, the difference will be between many OS including linux, windows and mac. Going further we will also compare processors also as a sub category which would include the i5 8th gen, i5 7th gen, i5 4th gen, i7, linux and mac. On other hand going into the RISC part we have taken into consideration only android smartphones but with different chipsets: Snapdragon 845, Snapdragon 425, MediaTek Helio P60 etc.

**Tools and APIs to be used**:

1. Java programming language: To develop the whole script
2. concurrent package in Java: To set up a Multi-threaded and Multi-Processing environment
3. I/O package in Java: To perform Input and Output operations
4. Java Compiler: To build a Java Class
5. JVM: To set different heap sizes and Run the script
6. Java 3D API: For 3D rendering task
7. Java Time package: To measure performance time
8. Android Studio: For making the application

The script will measure how much time (Suing Time Package) it takes to execute a task on a given OS and CPU. It will then display it on the terminal, and in case of the smartphones we will be displaying all the results through an application UI.

**Basis of Results/ Parameters**

Creating Threads: In this process a certain number of threads are created, without being used these threads terminate. So the time taken by the OS to create and terminate the thread is measured.

Creating Process: It is very similar to creation of threads but here threads are replaced by processes.

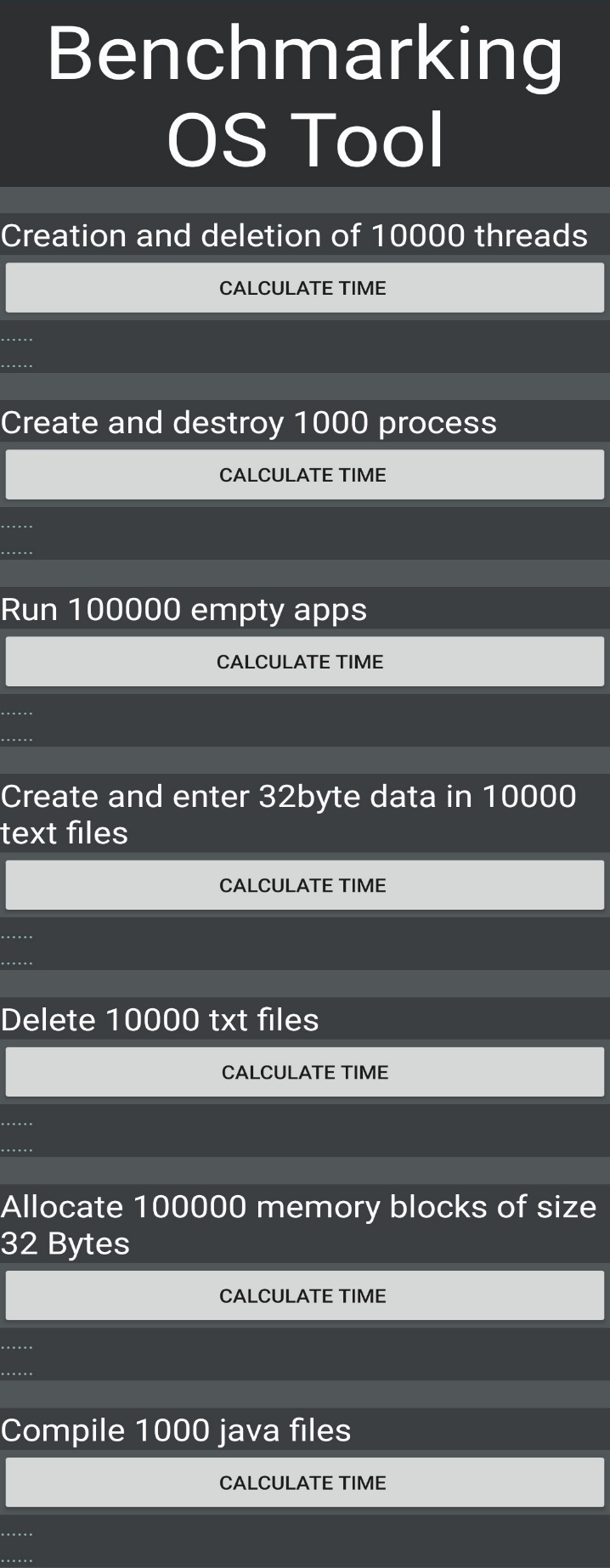
Launching Process: This is a process or we can say it is extension of creation of processes. In this the process are loaded and executed.

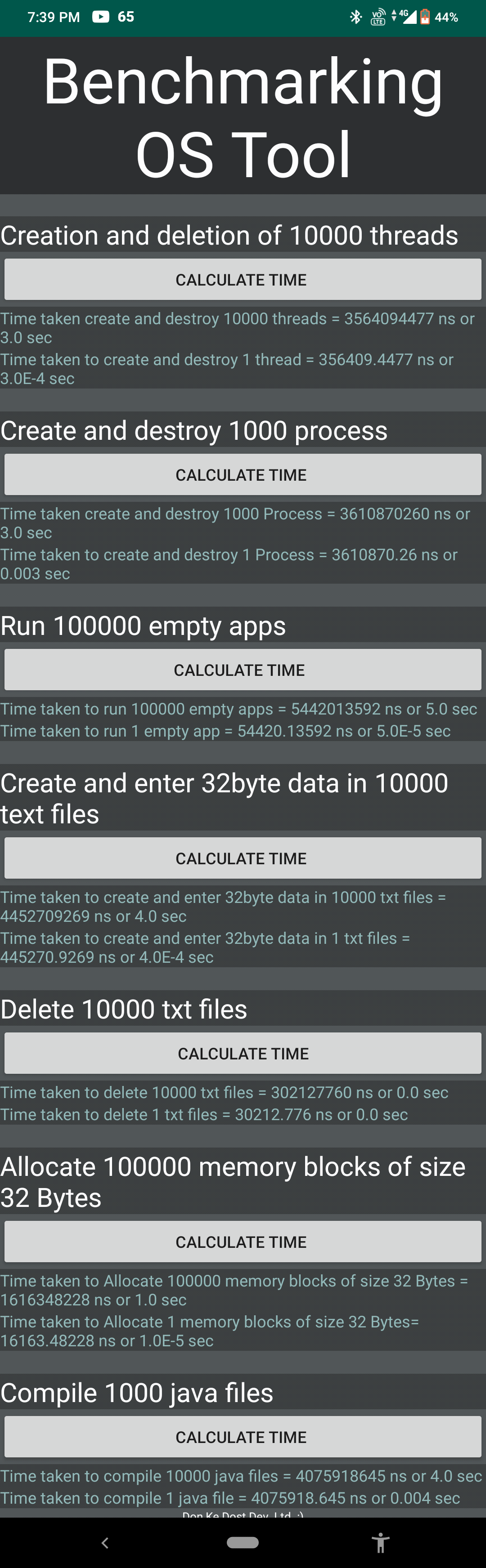
Creating Files: It is very similar to creation of threads but here threads are replaced by files in a large number.

Allocation of Memory: The memory allocation performance is measured by allocating small memory blocks (4-128 bytes in size) and then freeing them again.

Time to compile java file: This is actually measured by compiling 1000 java files then taking out the time for 1.

**UI of the Application**

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