***Multi-Threading Vs Multi-Tasking***

***Async***

Firstly talk about the difference between Multi-threading and Multi-tasking. Majority people are confused between these term. The first think is Multi-tasking is logical extension to multiprogramming, and the second think is Multi-threading is thread-based multi-tasking. The basic difference between Multitasking and multithreading is that **Multi-tasking** allows  CPU to perform multiple tasks (program, process, task, threads) simultaneously whereas, **Multi-threading** allows multiple threads of the same process to execute simultaneously.

**Comparison Multi-Threading Vs Multi-Tasking**

* There are three types of comparison Basic, Switching, Memory and Resource. These types are define below table.

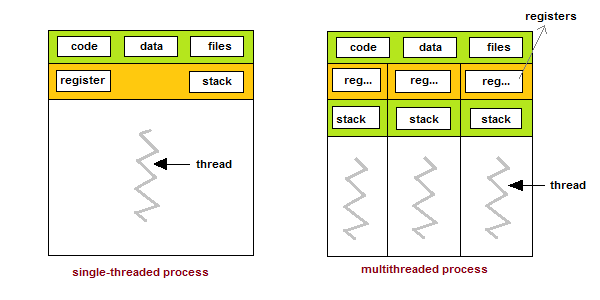
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| **Basis for comparison** | **Multi-Threading** | **Multi-Tasking** |
| Basic | Multi-threading let CPU to execute multiple threads of a process simultaneously. | Multi-tasking let CPU to execute multiple tasks at the same time. |
| Switching | In multi-threading CPU switches between the threads frequently. | In multi-tasking CPU switches between programs frequently. |
| Memory and Resource | In multi-threading system has to allocate memory to a process, multiple threads of that process shares the same memory and resources allocated to the process. | In multi-tasking system has to allocate separate memory and resources to each program that CPU is executing. |

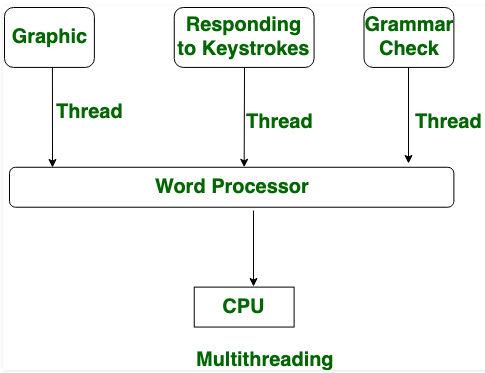
**Definition of Multi-Threading:-**

**Multi-threading** is different from multi-tasking in a sense that multi-tasking allows multiple tasks at the same time, whereas, the Multi-threading allows **multiple threads of a single task** (program, process) to be processed by CPU at the same time. The question arise is **what is thread?** A **thread** is a basic execution unit which has its **own program counter, set of the register, stack** but it shares the code, **data, and file** of the process to which it belongs.

A process can have multiple threads simultaneously, and the **CPU switches** among these threads so frequently making an impression on the user that all threads are running simultaneously and this is called **Multi-threading.**

**Diagram:-**





**Definition of Multi-Tasking:-**

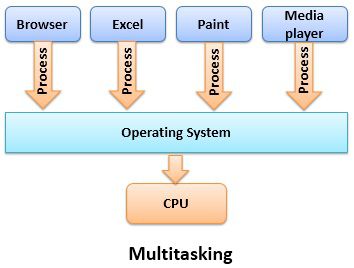
**Multi-tasking** is when a single CPU performs **several tasks (program, process, task, threads)** at the same time. To perform multi-tasking, the CPU switches among theses tasks very **frequently** so that user can interact with each program simultaneously.

In a multi-tasking operating system, several users can **share the system** simultaneously. As we saw the CPU rapidly switches among the tasks, so a little time is needed to switch from one user to the next user. This puts an impression on a user that entire computer system is dedicated to him.

**Image:-**



**Diagram:-**



**Conclusion:-**

Multi-tasking is similar to multiprogramming whereas, Multithreading is thread-based multitasking. Multi-threading is less costlier than multi-taskings as threads are easy to create then a process.