**FAST- National university of Computer and Emerging Sciences**

**CS 205: Operating Systems**

**Project Name:**

Comparison between Process and Threads

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1. **Introduction**:
   1. **Process:**

A process is the execution of a program that allows you to perform the appropriate actions specified in a program. It can be defined as an execution unit where a program runs. The OS helps you to create, schedule, and terminates the processes which is used by CPU. The other processes created by the main process are called child process.

* 1. **Thread:**

The smallest execution unit within a Process is Thread. A process can have multiple threads, all executing at the same time. It is a unit of execution in concurrent programming. A thread is lightweight and can be managed independently by a scheduler.

1. **Modules**:
2. **Merge Sort**

Merge Sort is a popular sorting technique which divides an array or list into two halves and then start merging them when sufficient depth is reached. Time complexity of merge sort is O(nlogn).

1. **Quick Sort**

Like **Merge Sort**, **Quick Sort** is a Divide and Conquer algorithm. It picks an element as pivot and partitions the given array around the picked pivot. There are many different versions of **Quick Sort** that pick pivot in different ways.

1. Always pick first element as pivot.
2. Always pick last element as pivot (implemented below).
3. Pick a random element as pivot.
4. **Selection Sort**

The selection sort algorithm sorts an array by repeatedly finding the minimum element (considering ascending order) from unsorted part and putting it at the beginning. The algorithm maintains two subarrays in a given array.

1) The subarray which is already sorted.  
2) Remaining subarray which is unsorted

1. **Tools:**
   1. C Language
   2. POSIX Library
   3. Pthreads Library
   4. Linux
2. **References:**
   1. StackOverflow
   2. geeksForgeeks