

***The University of Azad Jammu and Kashmir Muzaffarabad***

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| ***Course:*** | ***Operating System*** |
| ***Submitted To:*** | ***Mam Sidra*** |
| ***Lab Task no:*** | ***10*** |

***Threads in Operating Systems:***

*A thread is the smallest unit of a process that can be scheduled for execution. It represents a sequence of executable instructions within a process.*

***What is a Thread?***

*A thread is a lightweight process that shares resources with other threads in the same process.*

*Each thread has its own program counter (PC), register set, and stack, but it shares code, data, and files with other threads of the same process.*

*Threads enable parallel execution within a process, improving efficiency.*

***Types of Threads***

* ***User-Level Threads (ULT)***

*Managed by the user-level thread library.*

*The operating system (OS) is unaware of these threads.*

*Faster to create and manage.*

*If one thread blocks, the entire process is blocked.*

***Example:***

*POSIX Threads Pthreads, Java Threads*

* ***Kernel-Level Threads (KLT)***

*Managed by the operating system.*

*OS is aware of all threads and handles their scheduling.*

*More overhead due to system calls.*

*If a thread blocks, the OS can schedule another thread from the same process.*

***Example:***

*Windows Threads, Linux Threads*

***Light weight process.***

*Shifting from one tab to another is called context switching*

*Thread may single or multiple*

*Every single thread have some Non -shareable properties*

***Non- shareable properties***

* *identity*
* *program counter*
* *stack*
* *register*

***Shareable properties***

* *code or data*
* *Address*
* *space*
* *mgs queue*
* *F. D. T*
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