TITLE: CPU SCHEDULING ALGORITHM

**SYNOPSIS**

Department of CSIT

Operating System Lab (KCS-451)

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# Technology used:

* C

# IDLE:

* VS Code

**PROBLEM STATEMENT:**

The efficient allocation of CPU resources to processes in multitasking operating systems remains a significant challenge. Existing CPU scheduling algorithms exhibit limitations in terms of response time, throughput, and overall system performance. These limitations result in increased waiting time, reduced CPU utilization, and suboptimal task execution. Furthermore, the current algorithms do not adequately adapt to changing workloads or consider process characteristics and hardware constraints. Therefore, there is a pressing need for innovative CPU scheduling algorithms that optimize resource allocation, minimize waiting time, and improve overall system performance, ensuring fair and efficient execution of tasks in diverse multitasking environments.

**PROPOSED SOLUTION:**

Our project proposes the development of advanced CPU scheduling algorithms to address the limitations of existing approaches. The solution involves exploring innovative algorithms such as Priority Scheduling, Multilevel Queue Scheduling, and Shortest Remaining Time (SRT) to optimize CPU resource allocation.

The proposed solution includes designing adaptive algorithms that can dynamically adjust scheduling policies based on changing workloads and process characteristics. These algorithms will consider factors like process priorities, burst time, and arrival time to make intelligent decisions about task execution.

To validate the effectiveness of the proposed solution, extensive experimentation and performance evaluation will be conducted. Metrics such as average waiting time, response time, and throughput will be measured and compared against traditional scheduling methods.

The developed algorithms will be implemented in real-world simulations or operating system environments to ensure their practicality and scalability. By minimizing waiting time, maximizing throughput, and improving CPU utilization, the proposed solution aims to enhance system performance and user experience in multitasking environments.

Overall, the proposed solution aims to provide efficient CPU scheduling algorithms that can adapt to varying workloads, optimize resource allocation, and ensure fair execution of tasks, ultimately improving the overall efficiency and performance of multitasking operating systems.

**OUTCOME OF THE PROJECT:**

The outcome of this project is the development and evaluation of advanced CPU scheduling algorithms that result in efficient allocation of CPU resources to various processes in multitasking operating systems. The project aims to achieve the following outcomes:

1. Improved System Performance: The developed algorithms will optimize CPU utilization, minimize waiting time, and enhance overall system performance. This will result in faster response times, reduced process waiting times, and increased throughput.

2. Enhanced Resource Utilization: The proposed algorithms will ensure efficient allocation of CPU resources, balancing the workload across processes. This will maximize the utilization of CPU capacity, avoiding underutilization or overloading of system resources.

3. Adaptive Scheduling: The project will explore adaptive scheduling algorithms that can dynamically adjust scheduling policies based on changing workloads and process characteristics. This adaptability will enable the system to respond effectively to varying demands and optimize task execution.

By achieving these outcomes, the project aims to contribute to the improvement of multitasking operating systems, enhancing system performance, resource utilization, and overall user experience in diverse computing environments.

# GitHub Link: