COMS 552 (Principle of Operating Systems)

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Project Option : 2 (Implementation-Oriented Project)

Project Proposal : Enhancing Performance Through Smart Scheduling

This project proposal outlines our plan to enhance the Round Robin (RR) scheduling algorithm in operating systems. We will optimize RR and compare its performance with other scheduling algorithms to determine the impact of these enhancements on system efficiency and overall operating system performance.

Introduction :

Efficient process scheduling is a critical aspect of modern computing environments. Operating systems rely on scheduling algorithms to allocate CPU time to processes effectively. This project aims to improve the Round Robin scheduling algorithm and evaluate its performance relative to other scheduling algorithms like First Come First Serve (FCFS), Shortest Job First (SJF) and Traditional Round Robin....

Project Objectives :

The primary objectives of this project are as follows:

RR Algorithm Enhancement: We will focus on optimizing the Round Robin scheduling algorithm to distribute CPU time more efficiently and effectively.

Comparative Analysis : We will conduct a comparative analysis of the enhanced Round Robin algorithm against traditional scheduling algorithms, such as Traditional Round Robin , SJF (Shortest Job First) , FirstComeFirstServe (FCFS). The goal is to quantify the improvements in system performance.

Insights and Documentation : This project will provide valuable insights into the impact of Round Robin scheduling on overall operating system performance. We will document our findings and share the code for the enhanced Round Robin algorithm as open-source contributions.

Scope of Work :

The scope of our project will include the following activities:

Algorithm Enhancement : Optimize the Round Robin scheduling algorithm to improve CPU time allocation.

Testing and Evaluation : Implement the enhanced Round Robin algorithm in a simulated environment. Compare the performance of the enhanced RR algorithm against traditional scheduling algorithms. Gather data on CPU utilization, response times, and fairness.

Documentation and Reporting : Create a comprehensive report detailing the project, methodologies, and findings.

Project Methodology :

Our approach will involve the following steps:

- Research and analysis of the Round Robin scheduling algorithm and its limitations.
- Development and optimization of the Round Robin algorithm.
- Implementation of the enhanced Round Robin algorithm in a controlled environment.
- Performance testing and comparative analysis.
- Documentation of findings, lessons learned, and open-source code sharing.

Expected Outcomes :

The anticipated outcomes of this project are as follows:

- An enhanced Round Robin scheduling algorithm that improves system efficiency.
- A better understanding of the strengths and weaknesses of Round Robin scheduling in comparison to other algorithms.
- Valuable insights into how Round Robin scheduling impacts overall operating system performance.