Improved Round Robin Algorithm for an Efficient CPU Scheduling

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ABSTRACT

The algorithm policy applied by a CPU, to schedule running processes has an impact on the efficiency of an operating system (OS). As a result, a superior CPU scheduling algorithm leads to higher OS performance while using limited resources and for shorter periods of time. As a result, several strategies have been suggested and implemented to improve CPU scheduling performance. Any scheduler's primary responsibility is to assign jobs to the most effective and reliable resource available. It's also a fact that if jobs and resources aren't planned properly, the entire operating system's productivity suffers significantly. The “Round Robin” is deemed an effective and fair approach because of each process are allocated the same amount of time quantum. Nevertheless, the effectiveness of the system is determined by the selected time-quantum. The major goal of this research is to develop the present round robin algorithm by enhancing the time quantum for candidate processes in real time in such a way that its impartiality is maintained. There is no loss of property. This paper's proposed algorithm finds the time left in a process's last turn, and then Determines whether it is time based on a certain threshold value, should quantum be expanded or not. An arithmetic simulation has been created to demonstrate that the suggested method is correct. It outperforms the traditional round robin algorithm. In words of several performing metrics such as average waiting time, context-switches and number of turnaround time, the suggested adjusted version of round robin algorithm outperforms the traditional round robin algorithm, according to the results of the experimental investigation.

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List of Abbreviations, Acronyms

CPU – Central Processing Unit

RR – Round Robin Algorithm

FCFS - First Come First Serve

SJF - Shortest Job First

DABRR – Dynamic Average Burst Round Robin

SARR - Self-Adjustment-Round-Robin

TQ – Time Quantum

RQ – Ready Queue

TQ – Time Quantum

TAT – Total Average Time

CS – Context Switch

ATT – Average Turnaround Time

IRR – Improved Round Robin

AWT – Average Waiting Time

PCB – Process Control Block

Project Proposal Document Structure

The project proposal document will contain following chapters. References will be followed by the below declared chapters.

Chapter 1 - Introduction and Problem Domain

The objective of this section is to deliver an insight into the design scope undertaken. This section begins with a brief introduction to the domain, implications in RR Algorithm and the importance of the algorithm. It also describes current limitations which are present on the CPU scheduling domain related to the topic.

Chapter 2 - Literature review

The Literature review segment will consist of a detailed review which will enable to understand various approaches which has been utilized to achieve classification and the limitations prevailing in scalability and accuracy of the predicting mechanism of current research in hand.

Chapter 3 – Research question & Research Objectives

The Research question chapter is the preliminary step into the research and is an investigation into the certain concerns or issues related to fatal state prediction. It creates the basis that the entire project is based on later. The Research objectives chapter describes the objectives of the proposed model. It is categorized as main objective and sub-objectives.

Chapter 4 – Methodology

Methodology chapter will discuss the methodology govern in the research project. Also, the justification for selecting the appropriate methodology for each section is given in this chapter.

Chapter 5 – Discussion

Evaluate the results.

Chapter 6 - Timeline

Timeline chapter will clearly communicate the significant milestones and tasks is an important tool for effective project management. Project timelines plan the major deliverable of a project in a sequential manner.

Chapter 7 – Feasibility Analysis

This chapter provide an evaluation that brings all this project's important factors into account with scheduling and technical considerations; to determine the probability of finishing the research effectively.

Chapter 8 – Budget

An estimated budget describes under this section.

Chapter 9 – Risk Management

Unpredictable or random incidents that preparation can't prevent or control. As a result, this section is a proactive endeavour to anticipate and handle internal and external events and risks that affect the probability of a project's success.