

OPERATING SYSTEMS

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PROJECT REVIEW 1

PROJECT TITLE

SCHEDULING ALGORITHMS

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Scheduling Algorithms: An improved Round Robin CPU Scheduling Algorithm-Ananlysis and Implementation in different fields.

1. Motivation

We know, the Conventional Round Robin algorithm uses a random time quantum (most often of the range 20-50ms). The efficiency of scheduling algorithm is measured by the following performance factors:

1. Throughput: The number of processes executed in unit time.
2. Waiting- time: The amount of time a process has to wait for CPU in ready-queue.
3. Turn-around time: The total amount of time required by a process to complete execution.
4. Response time: The time taken from the generation of a request and the first response.
5. Context Switching: The process of switching CPU between processes. This is otherwise known as pre-emption.
6. CPU Utilization: A measure of maximum usage of CPU / how effectively CPU is made busy. The performance and effectiveness of the Round Robin algorithm is largely dependent on the value of time quantum selected. If the value of time quantum is too small then the number of context switches will be more and algorithm will not be effective. If the value of the time quantum is too large, then the algorithm will work more or less like FCFS algorithm. Choosing an optimum time quantum can significantly decrease the number of context switches, maintaining the RR nature and also can improve performance. The number of context switches can further be reduced if there is a strategy to execute processes with smallest remaining burst- times.

The Project is about the existing algorithms which are variants of RR algorithm. We attempt at briefing the proposed methodology, algorithmic procedure, pseudo code and flow chart, and illustrating it with an example, the working of the proposed algorithm. We further analyse the comparison of the proposed algorithm with other existing RR variants. Finally, we conclude and look into the future enhancements respectively.

1. Problem Statement

The performance and efficiency of multitasking operating systems mainly depends on the used CPU scheduling algorithm where the CPU is one of the primary computer resources. And, since the round robin scheduling algorithm is considered to be one of the most widely used algorithms, a new proposed variant of this algorithm is attempted to be established. We shall attempt improving upon the Round Robin CPU Scheduling System using Shortest Job First Scheduling, achievement of stability in the Round Robin Scheduling, Load Balancing in Cloud computing and Self-Adjustment Time Quantum depending on the burst time of the now-running process.

1. Project Scope and Applicability

The project presents a vast scope for future advancements and improvements. Each and every day, the world is growing better with the advancements in Technology. To follow up with the ever-increasing efficiencies, new scheduling algorithms are need to be presented and developed. Better the CPU scheduling algorithms in their efficiency, faster would be the jobs taken up by the processor, and hence faster the execution.

1. Aim

The Aim of the project is to try to Analyse the various CPU Scheduling Algorithms and to bring up an improved Round Robin CPU scheduling Algorithm-A self adjusting Time quantum depending on the burst time of the current running process and attempting the Shortest Job First Scheduling. Achievement of stability in the Round Robin Scheduling, andLoad Balancing in Cloud computing will also be analysed.

1. Objective

The Objective of the project is to create a self adjusting time quantum CPU scheduling. We shall try to implement the new proposed algorithm, called the dynamic-time-quantum, which basically uses the idea of making the time quantum repeatedly adjusted according to the burst-time of the now-running process.

1. Hardware/Software Specification

Hardware- CPU and other I/O devices for execution.

Software- C Programming(In terminal).

1. Project Description

One of the most important components of the computer resource is the CPU. CPU scheduling involves a careful examination of the pending processes to

-Existing System/Algorithms

-Disadvantages of existing System/Algorithms

We shall try to look into the domains and study and implement them in real life.

1. Roles and Responsibilities of each team member.

The tasks required to bring about a successful project not just depends upon but the collaborative efforts of the entire team. The roles have been planned to be distributed in the following way in order to bring about a perfect execution:

1. Understanding the concepts behind Scheduling algorithms and understanding their importance in CPU scheduling.
2. Identifying suitable softwares and platforms to execute the algorithms.
3. Working along the coding, using C or C++.

Karthik:

Looking into the concepts of Scheduling Algrithms and identifying the softwares used for the same.

Divya:

Understanding and Implementing the achievement of stability in the Round Robin Algorithm.

Diksha:

Analysis of Round Robin Algorithm for Load Balancing in Cloud computing.

Priyanshu:

Self-Adjustment Time Quantum in RR Algorithm depending upon the burst time of the now-running processes.

Shubh:

Improved Round robin with Shortest Job First Scheduling.