SUNWAY
INT'L BUSINESS SCHOOL

Program Name: Bachelor of Computer Science (HONS)

Course Code: CSC_1016

Course Name: Operating System

Research Paper Summary

Date of Submission: 21st January, 2022

Submitted By:

Student Name: Yunisha Tamang

IUKL ID: 042101900085

Semester: Second

Submitted To:

Faculty Name: Manoj Gautam

Department: BCS

An Optimized Round Robin Scheduling Algorithm for CPU Scheduling

Abstract

There are many algorithms available for CPU scheduling. But we cannot implemented in real time operating system because of high context switch rates and large waiting time. The proposed algorithm improves all the drawback of simple round robin architecture. It reduces the performance parameters to desirable extent and thereby increasing the system throughput.

Introduction

Scheduling is a fundamental function of an operating system and determines which process will run when there are multiple run-able processes. There are a number of scheduling algorithms like First-Come-FirstServe, Shortest-Job-Scheduled, Round Robin scheduling, but due to disadvantages these are severely used except in time sharing and real-time operating systems. The paper is organized in sections with the simple one algorithm and its objectives outlined in section.

Allocating CPU to a process requires careful attention to assure fairness and to avoid process starvation for CPU. When there are more than one process in the ready queue waiting in turn to be assigned to the CPU, the operating system must decide through the scheduler the order of execution in which they execute. The aim of operating system to allow a number of processes concurrently in order to maximize the CPU utilization. In a multi-programmed Operating system, a process is executed until it must wait for the completion of an input-output request. CPU scheduling plays a vital role by switching the CPU among several process.

Literature selection methodology

Literature selection methodology is the methodology that was followed in literature selection as described in this paper. The research articles were searched in the Google scholar database using the various keywords Operating System, CPU management, Scheduling Algorithms, Priority Algorithm, and Scheduling Processes. The result of the research at this stage is 65 articles. Literature selection methodology is the methodology followed in the literature selection phase The papers have been grouped into four different types: RR, SJF, FCFS, and Priority Algorithms. The proposed CPU is based on combining round-robin scheduling (RR) and priority-based (PB) scheduling. Experimental results showed that the new algorithm had fewer flaws than previous algorithms.

CPU Scheduling algorithms

Researchers have proposed an improved version of the round-robin CPU scheduling algorithm based on the k-means clustering technique. The proposed algorithm has a better performance by minimizing time cost compared with other algorithms. It was compared with PWRR, TRR, PRR, SRR, and ADRR algorithms. Researchers have proposed a new scheduling algorithm to improve the operating system's real-time performance. The proposed CPU is based on combining round-robin

scheduling and priority-based scheduling algorithms. Experimental results showed that the new algorithm improves all the round-robin scheduling computer flaws.

RR scheduling algorithm

The researchers proposed Enhanced Round Robin (ERR) to improve CPU performance by minimizing the waiting time and turnaround time. The proposed algorithm was compared with FCFS, SJF, RR, and BJF algorithms in four test cases. Results showed that ERR has a better performance by reducing the average waiting time and average turnaround time compared with other algorithms. The researchers are interested in time quantum computing and have compared the performance of the ORRSM and SRR algorithms against each other. The Manhattan resistance was used for the CPU burst times of processes to reach an optimal time quantum value. It shows a significant reduction in context switches, waiting times, and waiting times.

SJF scheduling algorithm

The SJF scheduling algorithm gives better performance for scheduling multimedia processes than the FCFS. There were different scheduler levels applied at different levels of the process, from the ready queue to the terminate. The proposed scheduling algorithm had less waiting time, response time, context switching and less preventive than the RR scheduling algorithm and less wait time. Researchers have discussed the algorithms used to schedule operations in the CPU multi-programming system, first come first served (FCFS), round-robin (RR), shortest job first (SJF) and other algorithms. Results showed that SJF is suitable for batch jobs where the Run time is predefined and each process can be executed based on minimum burst time.

FCFS scheduling algorithm

FCFS is the most suitable data analysis algorithm, being the effective implementation of data set and data. The results showed SJF best in less average waiting time between multiple scheduling algorithms and FCFS best in a simple application. The researchers designed the Map Reduce Analysis Process Management System (Map Reduce AMPS) to use the BPM (Big Data Process Management engine).

Priority scheduling algorithm

The results showed that the new solution solved the starvation problem and enhanced the normal Preemptive algorithm performance. The algorithm pays attention to higher priority tasks and executes them quickly and for low priority operations, reduces contextual switching. A new scheduling algorithm was proposed for high priority Cyber- Physical System random tasks. This algorithm improves the ending rate of random tasks that have high priority and can be executed more efficiently. The RR algorithm improves the average waiting time, throughput time, turnaround time, and. response time, as well as maximizing CPU utilization. The largest percentage of 68% is reached in the RR algorithm only. The results are shown in Figure 2, with a percentage of 12% in FCFS and 16% in SJF with RR.

Conclusion

According to the study, improved scheduling methods for various CPU's can minimize response time, wait time, and overheads in CPU, disk, and memory use while increasing productivity. In the future, researchers can do more study and investigate various scheduling algorithms that are optimal and so deliver the highest level of customer happiness. Furthermore, the CPU algorithms enable the user to achieve good results without wasting significant time.

Reference:
(https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.301.5799&rep=rep1&type=pdf)