

PROJECT TITLE

SCHEDULING ALGORITHMS FOR EFFECTIVE MANAGEMENT IN DIAGNOSTIC CENTRES



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TIRED OF WAITING IN QUEUES ?

WANT QUICK REPORTS?



- ❑ We are there to provide a solution .
- ❑ Scheduling algorithms focuses on the applications of analytical methods to facilitate better decision making.
- ❑ If scheduling algorithms are used as part of mainstream decision making by diagnostic centre specialists ,then it is easy to solve real world problems faced by the common people in diagnostic centres.
- ❑ We explained basic applications along with problems with suitable simple solutions through scheduling algorithm techniques.
- ❑ Viral fevers such as dengue,malaria etc can be treated but Frequently we have to check the malaria parasite at diagnostic centers based on the symptoms of malaria namely suffering fever, headache, joint pain etc., common people are facing so many problems at diagnostic centers at the time of parasite checking.
- ❑ The following are some of the problems at diagnostic centers along with solutions in different scheduling algorithm approaches

- ❑ In India, patients need to make an appointment for a diagnostic centre specialist. In theory, an appointment system reduced patient waiting time. In practice, the waiting time can still be substantial. Various rules and algorithms are used to solve this .

Problem1: Long waiting time at outpatient clinics before consultation.

- The first and simplest outpatient appointment scheduling algorithm is ***first-come, first-served (FCFS)*** scheduling algorithm. With this scheme, the specialist requests the person first is allocated the bed first for parasite checkup. The implementation of the FCFS policy is easily managed with FIFO queue. When a person enters into the queue for appointment and the specialist is free, person is allocated to the specialist at the head of the queue. The running person is removed from the queue



Problem2: Long time for single consultation.

- If a patient consulted the doctor , doctor advises MRI scans etc which takes Longer time. In the meanwhile the doctor can treat another patient which is effective . But doctor has to wait until reports are brought by patient to complete the consultation process.
- This can be resolved by using **SJF PRE- EMPTIVE SCHEDULING ALGORITHM** .
- One patient should consult the doctor and should complete the tests prescribed doctor , in the meanwhile doctor can diagnose another person whose consulting time is less.



Problem3: Need of Personalized consultation.

- Some patients desire to have personalized consultation i.e if a patient enters into the consulting room , he/she has to complete the consultation process and next patient should be given a chance.
- But different persons have different number of hours for consultation.
- To achieve effective management with personalized consultation, **SJF NON-PREEMPTIVE SCHEDULING ALGORITHM** should be implemented i.e a patient who has less consultation period given permission to consultation room.



Problem4: Emergency consultations are not achieved.

- Needy and emergency conditioned patients are not being serviced well .
- Old age people , children and other emergency cases have to get consultation first. This can be achieved using **PRIORITY SCHEDULING**.
- Old age people , children and other emergency cases have to be ranked with high priority and given medication.



Problem5: Delayed Reports

- In Diagnostic centres , for faster blood reports . Eg: Malaria test

The **Round Robin algorithm** is designed especially for time sharing system. RR is similar to FCFS but preemption is added to switch between patients. A small unit of time called time quantum is defined. In the process of parasite checking, there so many steps namely taking blood from the person, preparing blood smear, analysis of smear in microscope and final interpretation etc.,.

In all previous algorithms we have to do all these steps within time allocation of patient.



Wasting of time is possible while using above discussed algorithms between each step of parasite checking. In this method we can avoid wasting of time between each step. In this case, we have give break to patient between each step namely time quantum so that simultaneously we can do work with more than one patient at a time. This leads to saving patient, specialist time and possibility of testing more patients. Here we can minimize average waiting time of patients.

CPU SCHEDULING:

CPU scheduling is the basis of multi-programmed operating system. By switching the CPU among processes, the operating system can make the computer more productive. A multiprogramming operating system allows more than one processes to be loaded into the executable memory at a time and for the loaded processes to share the CPU using time-multiplexing.

Part of the reason for using multiprogramming is that the operating system itself is implemented as one or more processes, so there must be a way for the operating system and application processes to share the CPU. Another main reason is the need for process to perform I/O operations in the normal course of computation. Since I/O operations ordinarily require orders of magnitude more time to complete than do CPU instructions, multiprogramming systems allocate the CPU to another process whenever a process invokes an I/O operation.

CPU SCHEDULER:

Whenever, the CPU becomes idle, the operating system must select one of the processes in the ready-queue to be executed. The selection process is carried out by the short-term scheduler or CPU scheduler. The CPU scheduler selects a process from the processes in memory that are ready to execute and allocates the CPU to that process.

SCHEDULING CRITERIA :

Different CPU scheduling algorithms have different properties, and the choice of a particular algorithm may favor one class of processes over another. In choosing which algorithm to use in a particular situation, we must consider the properties of the various algorithms.

The criteria include the following:

1. CPU scheduling.
2. Throughput.
3. Turnaround time.
4. Waiting time.

5. Response time.

SCHEDULING ALGORITHMS:

- 1.First come first search
- 2.Shortest job first scheduling
- 3.Priority scheduling.
- 4.Round robin.

SOFTWARES USED:

- JAVA
- ECLIPSE

Example for FCFS Algorithm using GUI:

