A Course Based Project Report on

BANKING SYSTEM USING FCFS AND PRIORITY SCHEDULING

Submitted to the

Department of Information Technology

in partial fulfilment of the requirements for the completion of course
OPERATING SYSTEM LAB

BACHELOR OF TECHNOLOGY

IN

INFORMATION TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY

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CERTIFICATE

This is to certify that the project report entitled "**Banking System using FCFS and Priority Scheduling**" is a bonafide work done under our supervision and is being submitted by **A. Jayanth (22071A1267), B.Omprakash (22071A1268), E.Nandeeshwar(22071A1277), Satya Rathnakar (22071A1278)** in partial fulfilment for the award of the degree of **Bachelor of Technology** in Information Technology, of the VNRVJIET, Hyderabad during the academic year 2022-2023.

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DECLARATION

We declare that the course based project work entitled "**Banking System using FCFS and Priority Scheduling**" submitted in the Department of Information Technology, Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, Hyderabad, in partial fulfilment of the requirement for the award of the degree of **Bachelor of Technology in Information Technology** is a bonafide record of our own work carried out under the supervision of **C.Kamala, Assistant Professor, VNRVJIET.** Also, we declare that the matter embodied in this thesis has not been submitted by us in full or in any part thereof for the award of any degree/diploma of any other institution or university previously.

Place: Hyderabad.

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ABSTRACT

This project presents a simulation of a Banking System utilizing two fundamental scheduling algorithms: First-Come, First-Served (FCFS) and Priority Scheduling. The system manages a variety of customer service requests such as account creation, deposits, withdrawals, and loan applications. The FCFS algorithm processes requests in the order they are received, ensuring fairness by treating all requests equally. In contrast, the Priority Scheduling algorithm processes requests based on their assigned priority levels, ensuring that more critical requests are addressed promptly.

The implementation focuses on handling concurrent customer requests efficiently, maintaining data integrity, and ensuring a seamless customer experience. By simulating real-world banking scenarios, this project demonstrates the practical applications and advantages of different scheduling strategies in a service-oriented environment. The system is designed to be robust and scalable, capable of adapting to various operational demands in a modern banking infrastructure. Through this simulation, the project highlights the importance of choosing appropriate scheduling algorithms to optimize service delivery and customer satisfaction in the banking sector.

INTRODUCTION

In the modern banking industry, efficient management of customer service requests is crucial for maintaining high levels of customer satisfaction and operational efficiency. Banks handle a diverse array of requests daily, including account creation, deposits, withdrawals, and loan applications. Given the volume and variety of these requests, effective scheduling mechanisms are essential to ensure timely and orderly processing.

This project explores the implementation of a Banking System that leverages two fundamental scheduling algorithms: First-Come, First-Served (FCFS) and Priority Scheduling. The FCFS algorithm processes customer requests in the order they are received, ensuring fairness by treating all requests equally, regardless of their nature or urgency. This method is straightforward and easy to implement but may not always be the most efficient in handling high-priority or time-sensitive requests.

On the other hand, Priority Scheduling addresses this limitation by assigning a priority level to each request. Requests with higher priority levels are processed before those with lower priorities, regardless of their arrival time. This approach ensures that critical tasks, such as fraud alerts or high-value transactions, are addressed promptly, enhancing overall system responsiveness and customer satisfaction.

OBJECTIVE

The objective of this project is to design and implement a Banking System that effectively manages customer service requests through the application of two distinct scheduling algorithms: First-Come, First-Served (FCFS) and Priority Scheduling. The project aims to create a simulated banking environment capable of handling various types of customer requests, including account creation, deposits, withdrawals, and loan applications. By implementing the FCFS scheduling algorithm, the system will process requests in the order they are received, ensuring a fair and straightforward approach to handling service requests.

SOURCE CODE:

```python
import queue
# FCFS Implementation
class Customer:
    def __init__(self, name, arrival_time):
        self.name = name
        self.arrival_time = arrival_time


    def __repr__(self):
        return f"Customer(name={self.name}, arrival_time={self.arrival_time})"


class FCFSBankingSystem:
    def __init__(self):
        self.queue = queue.Queue()


    def add_customer(self, customer):
        self.queue.put(customer)


    def serve_customer(self):
        if not self.queue.empty():
            customer = self.queue.get()
            print(f"Serving {customer}")
```

```python
        else:
            print("No customers to serve")


# Priority Scheduling Implementation
class PriorityCustomer:
    def __init__(self, name, priority):
        self.name = name
        self.priority = priority


    def __lt__(self, other):
        return self.priority < other.priority


    def __repr__(self):
        return f"PriorityCustomer(name={self.name}, priority={self.priority})"


class PriorityBankingSystem:
    def __init__(self):
        self.priority_queue = queue.PriorityQueue()


    def add_customer(self, customer):
        self.priority_queue.put(customer)


    def serve_customer(self):
        if not self.priority_queue.empty():
            customer = self.priority_queue.get()
            print(f"Serving {customer}")
```

```python
        else:

            print("No customers to serve")


# Combined System Implementation

class CombinedBankingSystem:

    def __init__(self):

        self.fcfs_system = FCFSBankingSystem()

        self.priority_system = PriorityBankingSystem()

        self.use_priority = False


    def add_customer(self, customer, priority=None):

        if self.use_priority and priority is not None:

            self.priority_system.add_customer(PriorityCustomer(customer.name, priority))

        else:

            self.fcfs_system.add_customer(customer)


    def serve_customer(self):

        if self.use_priority:

            self.priority_system.serve_customer()

        else:

            self.fcfs_system.serve_customer()


    def set_priority_mode(self, use_priority):

        self.use_priority = use_priority


# Example usage:
```

```python
combined_system = CombinedBankingSystem()


# Add customers for FCFS

combined_system.add_customer(Customer("Customer A", "09:00"))

combined_system.add_customer(Customer("Customer B", "09:05"))

combined_system.add_customer(Customer("Customer C", "09:10"))


# Serve in FCFS mode

combined_system.serve_customer()

combined_system.serve_customer()

combined_system.serve_customer()


# Switch to priority mode

combined_system.set_priority_mode(True)


# Add customers with priorities

combined_system.add_customer(Customer("Customer D", "09:15"), priority=3)

combined_system.add_customer(Customer("Customer E", "09:20"), priority=1)

combined_system.add_customer(Customer("Customer F", "09:25"), priority=2)


# Serve in priority mode

combined_system.serve_customer()

combined_system.serve_customer()

combined_system.serve_customer()
```

OUTPUT

Serving Customer(name=Customer A, arrival_time=09:00)

Serving Customer(name=Customer B, arrival_time=09:05)

Serving Customer(name=Customer C, arrival_time=09:10)

Serving PriorityCustomer(name=Customer E, priority=1)

Serving PriorityCustomer(name=Customer F, priority=2)

Serving PriorityCustomer(name=Customer D, priority=3)

CONCLUSION

This research presents a novel application of the First-Come, First-Served (FCFS) and Priority Scheduling algorithms in Banking System to address the challenges of existing Banking system. In brief, integrating FCFS and Priority Scheduling in the banking system balances fairness and efficiency. FCFS ensures fairness by serving customers in arrival order, while Priority Scheduling prioritizes urgent transactions. This approach optimizes resource usage and adapts to workload fluctuations. Challenges like mismanagement and resistance to change need addressing. Overall, it enables timely service while meeting diverse customer needs.

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