

ONE WAY EXIT IN MOVIE THEATRE USING QUEUES

**A Case Study Report submitted to
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR.**

in Partial Fulfillment of the Requirements for the Award of the degree of

**BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND SYSTEMS ENGINEERING**

Submitted by

K.VENKATESWAR REDDY (21121A1561)

Under the Guidance of

Mr. P. Yogendra Prasad
Assistant Professor



Department of Computer Science and Systems Engineering
Sree Vidyanikethan Engineering College (Autonomous)

Sree Sainath Nagar, Tirupati – 517 102

(2022-2023)



SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)

Sree Sainath Nagar, Tirupati

DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS ENGINEERING

CERTIFICATE

This is to certify that the case study report entitled

“ONE WAY EXIT IN MOVIE THEATRE USING QUEUES ”

is the Bonafide work done by

K.VENKATESWAR REDDY

(21121A1561)

in the Department of **Computer Science and Systems Engineering**, and submitted to Jawaharlal Nehru Technological University Anantapur, Ananthapuramu in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Systems Engineering during the academic year 2022-2023. This work has been carried out under my supervision. The results of this case study work have not been submitted to any university for the award of any degree or diploma.

Guide:

Head:

Mr. P. Yogendra Prasad

Assistant Professor

Dept. of CSSE

Dr. K. Ramani

Professor & Head

Dept. of CSSE

INTERNAL EXAMINER

EXTERNAL EXAMINER

**DEPARTMENT OF COMPUTER SCIENCE AND SYSTEMS
ENGINEERING**

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VISION

- **To become a Centre of excellence in Computer Sciences and Systems Engineering through Teaching, Training and Innovation to produce high quality engineering professionals who can solve the growing complex problems of the society and industry.**

MISSION

- Established with cause of development of technical education in advanced Computers Sciences and Systems Engineering with applications to systems there by serving the society and Nation.
- Transfer of knowledge through contemporary curriculum and fostering faculty and student development.
- Create keen interest for research and innovation among students and faculty by understanding the needs of the society and industry.
- Skill Development among diversity of students in technical in technical domains and profession for development of systems and processes to meet the demands of the industry and research.
- Imbibing values and ethics in students for prospective and promising engineering and develop a sense of respect for all.

Program Educational Objectives (PEO's)

After few years of graduation, the graduates of B.Tech (CSSE) will:

- 1 Demonstrate competencies in the Computer Science domain and
· Management
 with an ability to comprehend, analyze, design and create
 software systems for pursuing advanced studies in the areas of
 interest.
- 2 Evolve as entrepreneurs or be employed by acquiring required
· skill sets for developing computer systems and solutions in multi-
 disciplinary areas.
- 3 Exhibit progression and professional skill development in
· Computer programming and systems development with ethical
 attitude through life-long learning.

Program Specific Outcomes (PSO's)

On successful completion of the Program, the graduates of B. Tech (CSSE) program will be able to:

- PSO1** Employ Systems Approach to model the solutions for real life problems, design and develop software systems by applying Modern Tools.
- PSO2** Develop solutions using novel algorithms in High Performance Computing and Data Science.
- PSO3** Use emerging technologies for providing security and privacy to design, deploy and manage network systems.

Program Outcomes (PO's)

1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems (**Engineering knowledge**).
2. Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences (**Problem analysis**).
3. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations (**Design/development of solutions**).
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions (**Conduct investigations of complex problems**).
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations (**Modern tool usage**).
6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice (**The engineer and society**).
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development (**Environment and sustainability**).

8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice (**Ethics**).
9. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings (**Individual and team work**).
10. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions (**Communication**).
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12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change (**Life-long learning**).

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We hereby declare that this case study report titled “**songs playlist management**” is a genuine work carried out by us, in **B.Tech (*Computer Science and Systems Engineering*)** degree course of **Jawaharlal Nehru Technological University Anantapur** and has not been submitted to any other course or University for the award of any degree by us.

I declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea / data / fact / source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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ABSTRACT

Implementing a queue system for a one-way exit in a movie theatre using C programming language is a way to efficiently manage the flow of people leaving the theatre. The queue will be implemented using a linked list data structure, which allows for the dynamic allocation of memory and the efficient insertion and deletion of elements.

The implementation will include a function to enqueue patrons as they exit the theatre, adding them to the end of the queue. Another function will dequeue patrons, removing them from the front of the queue. A function will be used to check if the queue is empty, and another function will be used to retrieve the number of patrons in the queue at any given time.

To ensure the safety of the patrons, the queue will be implemented with synchronization mechanisms, such as mutex locks, to prevent multiple threads from accessing the queue simultaneously.

In conclusion, the implementation of a queue system for a one-way exit in a movie theatre using C programming language will provide a reliable and efficient method of managing the flow of patrons, while ensuring the safety and well-being of all individuals involved.

Keywords : Enqueue, Dequeue, Fifo system.

TABLE OF CONTENTS

Title	Page No.
Abstract -----	i
Chapter 1: Introduction -----	11
1.1 Introduction-----	11
1.2 Statement of the problem-----	11
1.3 Objectives-----	12
1.4 Applications-----	12
1.5 Limitations-----	13
Chapter 2: System Design -----	15
2.1 Requirements-----	15
2.2 System design-----	16
Chapter 3: Coding and Result -----	21
3.1 Code-----	21
3.2 Result-----	25
Chapter 4 Conclusion -----	27
4.1 Conclusion-----	27
4.2 Future work-----	28

CHAPTER 1

INTRODUCTION

1.1 Introduction:

A queue is a data structure that follows the First-In-First-Out (FIFO) principle, which means that the first item to be added to the queue will be the first one to be removed. This makes it ideal for situations where you need to maintain a sequence of events, such as people waiting in line to exit a movie theatre.

To implement a queue in C, you can use an array or a linked list. In this example, let's implement it using an array.

Here's an outline of the steps you need to follow to implement a queue for a one-way exit in a movie theater:

Define a structure to represent each person in the queue, which should contain their name and other relevant information.

Create an array of the defined structure to represent the queue.

Implement functions to add a person to the end of the queue (enqueue) and remove a person from the front of the queue (dequeue).

Use a variable to keep track of the front and rear of the queue.

Implement error handling for situations such as the queue being full or empty.

1.2 problem statement:

To implement one way exit in a movie theatre using queues,

The first person who enters the queue will exits first(FIFO).

1.3 Objectives:

- To ensure social distancing protocols are followed by customers in the movie theater.
- To prevent the gathering of large crowds in a single area and minimize the risk of transmission of infectious diseases.
- To implement a seamless and efficient exit process for movie-goers that eliminates bottlenecks and reduces wait times.
- To design a queue management system that prioritizes the safety and comfort of customers while they wait to exit the theater.
- To train theater staff to effectively manage the exit queue and ensure customers are following the one-way exit protocol.
- To incorporate necessary signage and visual cues to guide customers through the one-way exit process.
- To regularly monitor and evaluate the effectiveness of the one-way exit process and make improvements as needed.

1.4 Applications:

- **Managing Crowd Control:** Implementing a one-way exit system using a First-In-First-Out (FIFO) queue helps in controlling the crowd and preventing overcrowding in the theater. This is particularly important during busy periods when the theater is expected to have high footfall.
- **Maintaining Social Distancing:** With a one-way exit system in place, customers are encouraged to maintain safe distances from each other, which reduces the risk of transmission of infectious diseases.

- **Improving Customer Experience:** The FIFO queue system ensures that customers are able to exit the theater smoothly and efficiently, without having to push or jostle for space. This leads to an improved overall customer experience.
- **Efficient Flow of Traffic:** The one-way exit system helps in directing customers out of the theater in an organized manner, reducing wait times and avoiding bottlenecks. This helps to prevent congestion and ensures a smooth flow of traffic.
- **Easy Management:** Implementing a one-way exit system using FIFO queue management tools makes it easier for theater staff to manage the exit process, as they can clearly see who has been waiting the longest and direct customers accordingly.
- **Enhanced Safety:** By eliminating the potential for overcrowding, a one-way exit system can help to enhance the safety of customers in the theater, particularly during emergency situations where a quick and organized evacuation is required.
- **Better Resource Utilization:** With a well-designed one-way exit system in place, the theater can make better use of its resources, such as staff, by reducing the need for additional personnel to manage crowd control during peak periods.

1.5 Limitations:

- **Limited capacity:** The capacity of a FIFO system is limited by the number of people that can wait in line. In the case of a movie theater, this means that there may be bottlenecks at the exit, leading to congestion and delays.

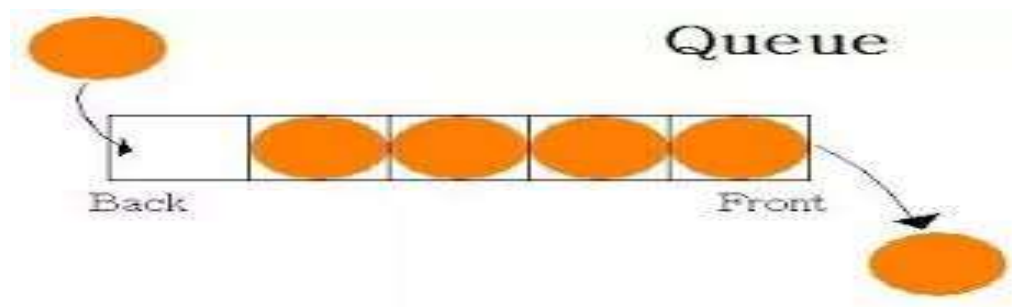
- **Inefficient use of space:** A FIFO queue requires a significant amount of space to accommodate all the people waiting in line. This can be especially problematic in a movie theater, where space is often limited.
- **Limited adaptability:** A FIFO system is not very flexible or adaptable to changing conditions. For example, if a large group of people needs to exit the theater at the same time, a FIFO system may not be able to handle the sudden increase in demand.
- **Potential for crowding and safety issues:** A FIFO system can lead to crowding at the exit, especially if people are not able to move quickly through the queue. This can create safety concerns, particularly in emergency situations.
- **Time-consuming:** The process of waiting in line can be time-consuming and annoying for movie-goers, which may negatively impact their overall experience.

CHAPTER 2

SYSTEM DESIGN

2.1 Requirements:

- **Physical Space:** You will need to allocate enough physical space for the queue, taking into account the number of people expected to attend the movie and the recommended social distancing guidelines.
- **Queue Management System:** You will need to set up a queue management system, such as ropes or stanchions, to keep the line organized and to prevent people from cutting in line.



- **Signage:** Clearly visible signs should be placed at the entrance to the theater to indicate the start of the queue and to direct people to follow the one-way exit.
- **Staffing:** You will need to allocate sufficient staff to manage the queue, including to enforce the one-way exit and to assist with any problems that may arise.

- **Emergency Exits:** Emergency exits should be clearly marked and accessible in case of an emergency. The one-way exit should not interfere with the accessibility of emergency exits.

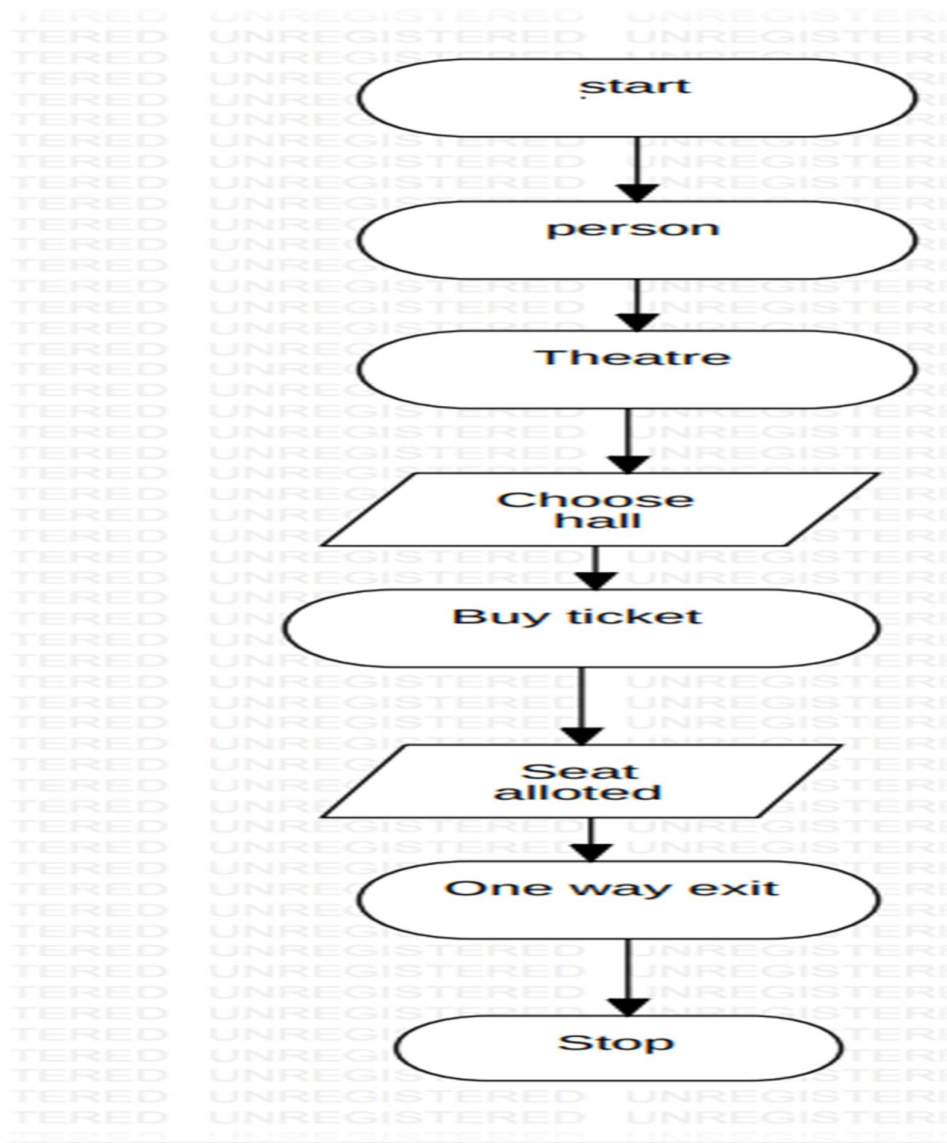


- **Monitoring:** You will need to establish a system to monitor the queue and the one-way exit, to ensure that the FIFO system is being followed and to identify and resolve any issues that may arise.

2.2 System design:

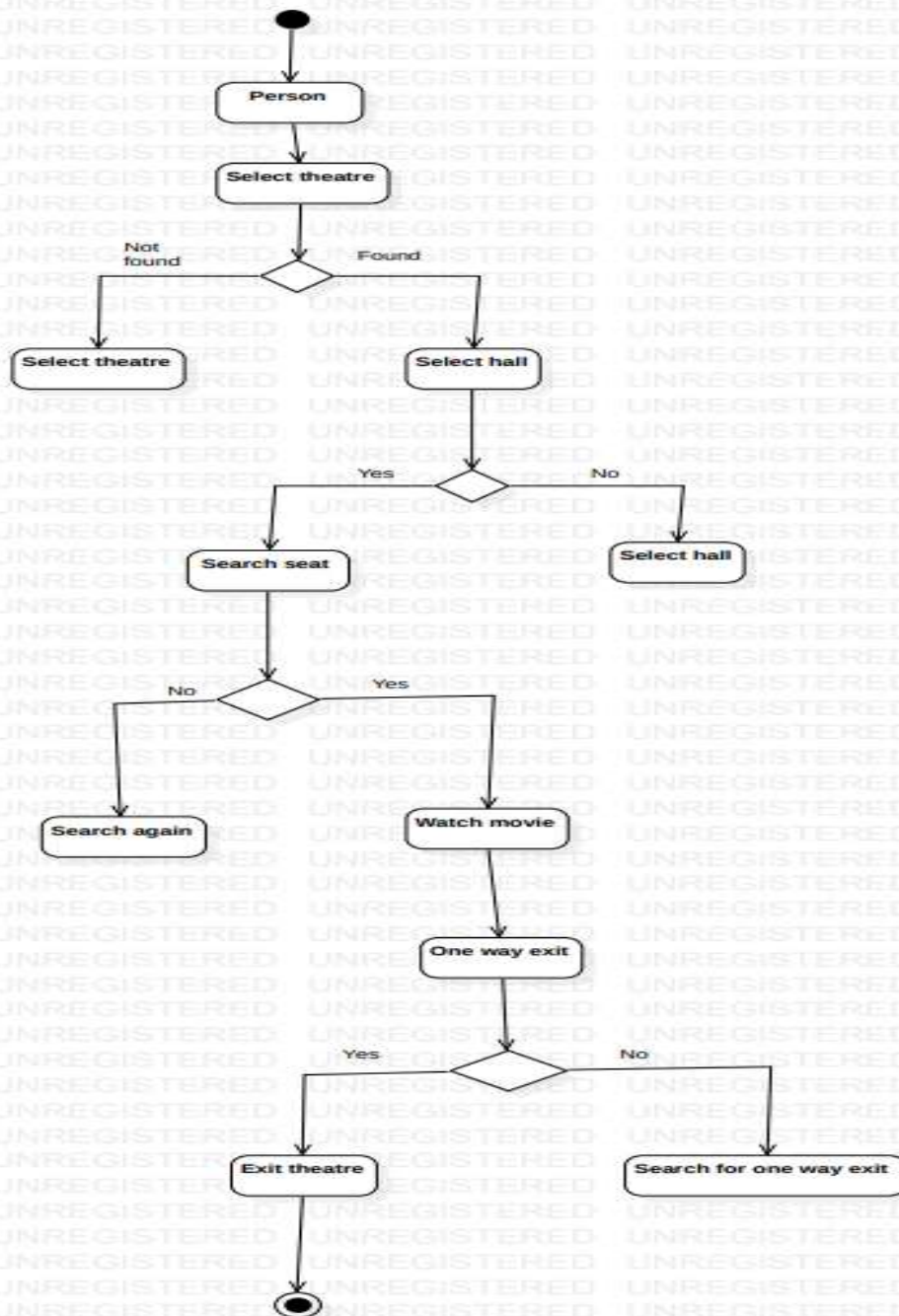
Flowchart:

A flow chart is a visual representation of a process or workflow that shows the steps involved in the process and the relationships between them. It is a diagram that uses symbols and arrows to represent the flow of information, materials, or tasks in a process.



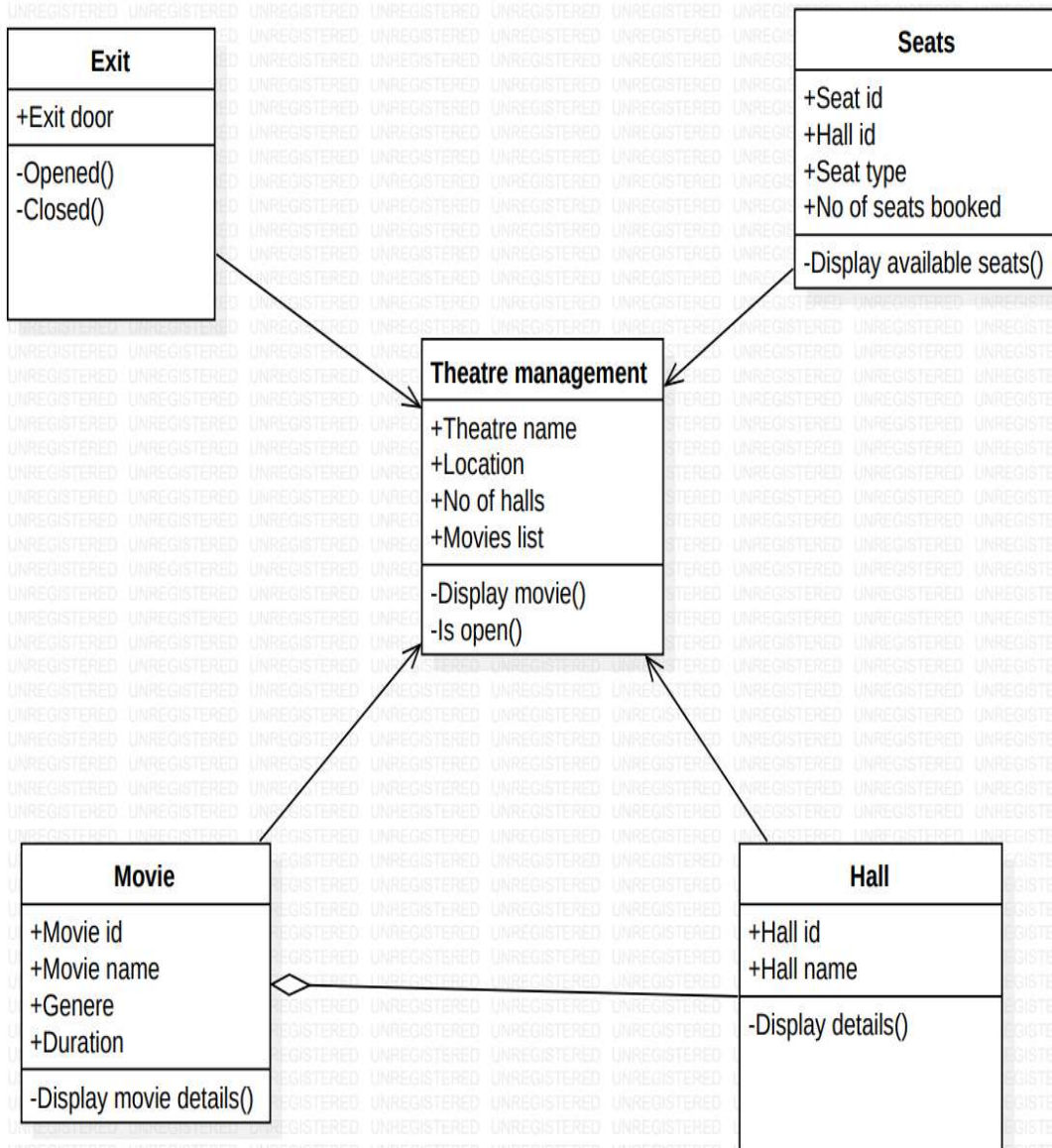
Activity diagram:

Activity diagram is a behavioral diagram in UML (Unified Modeling Language) that represents the flow of activities or actions within a system. It is used to model the dynamic aspects of a system and capture the behavior of the system by illustrating the flow of control from one activity to another.



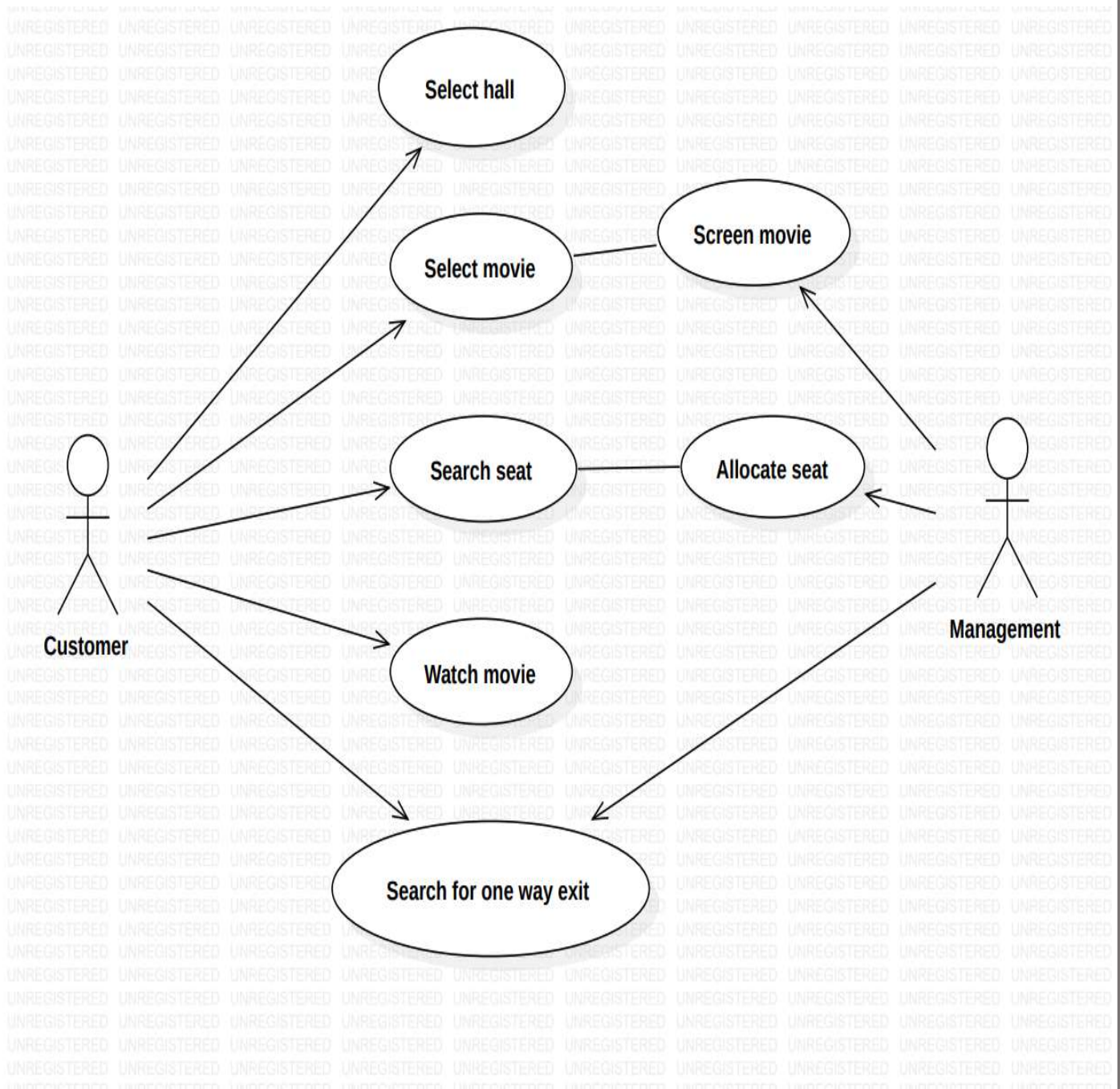
Class diagram:

A class diagram is a type of diagram in the field of software engineering that describes the structure of a system by showing the system's classes, their attributes, and the relationships between the classes. It is a graphical representation of the classes, objects, and the relationships between them in a software system.



Use case diagram:

A use case diagram is a type of diagram used in software engineering to represent the relationships between the various components of a system and the actions that the system can perform.



CHAPTER 3

CODING AND RESULTS

3.1 Code:

```
#include <stdio.h>

int rear = -1, front = 0 ;
char a[50];
char number[3][10];
int n;

void insert();
void del();
void display();
void main()
{
    int ch;
    while(ch!=4)
    {
        printf("1. ENTER THE PERSON\n2. EXIT THE\nPERSON\n3. DISPLAY\n4. EXIT\n");
        printf("Enter your choice :");
        scanf("%d", &ch);
        switch(ch)
        {
            case 1 :
```

```

insert();
    break;
    case 2 :
    del();
    break;
    case 3 :
    display();
    break;
    case 4 :
    exit(0);
    }
}
}
void insert()
{
    int i;
    printf("ENTER TOTAL NO OF MEMBERS ENTERED INTO
    THEATRE");
    scanf("%d",&n);

    for(i=0;i<n;i++)
    {
        printf("ENTER THE NAMES OF THE PERSONS WHO ENTERED
        INTO THEATRE :");
        scanf("%s",number[i]);
        if(rear+1==3)

```

```

    {
        printf("Queue is full\n");
    }
else
{
    rear = rear+1;
    a[rear] = number[10];
    printf("Person is in queue\n");
}
}
}
void del()
{
    if(front>rear)
    {
        printf("Theatre is empty");
    }
else
{
    front=front+1;
    printf("\n%s EXITED FROM THEATRE\n",number[front-1]);

}
}
void display()
{

```

```
int i;
printf("THE PEOPLE IN THE QUEUE ARE : \n");
if(front==rear)
{
    printf("Queue is empty\n");
}
else
{
    for(i=0;i<n;i++)
    {
        printf("%s\n",number[i]);
    }
}
}
```


3.2 Result:

```
K:\VENKY CODE.exe
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :1
ENTER TOTAL NO OF MEMBERS ENTERED INTO THEATRE:
2
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :venky
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :rajesh
Person is in queue
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :3
THE PEOPLE IN THE QUEUE ARE :
venky
rajesh
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

venky EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :
```

```
K:\VENKY CODE.exe
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :1
ENTER TOTAL NO OF MEMBERS ENTERED INTO THEATRE:3
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :farooq
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :mahesh
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :bhargav
Person is in queue
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

farooq EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :3
THE PEOPLE IN THE QUEUE ARE :

mahesh
bhargav
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :|
```

```
K:\VENKY CODE.exe
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :1
ENTER TOTAL NO OF MEMBERS ENTERED INTO THEATRE:4
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :venky
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :tharun
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :bhanu
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :bhargav
Queue is full
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

venky EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

tharun EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :
```

```
K:\VENKY CODE.exe
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :1
ENTER TOTAL NO OF MEMBERS ENTERED INTO THEATRE:3
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :mohan
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :vishnu
Person is in queue
ENTER THE NAMES OF THE PERSONS WHO ENTERED INTO THEATRE :manoj
Person is in queue
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

mohan EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :2

vishnu EXITED FROM THEATRE
1. ENTER THE PERSON
2. EXIT THE PERSON
3. DISPLAY
4. EXIT
Enter your choice :4

-----
Process exited after 23.08 seconds with return value 0
```

CHAPTER 4

CONCLUSION

4.1 Conclusion:

In conclusion, the implementation of a one-way exit system in movie theatre using queues can be a highly effective solution for ensuring the safety and comfort of theatre-goers. By utilizing a well-designed queue system, movie theatres can effectively manage the flow of patrons during peak times and minimize congestion at exits. Additionally, by ensuring that all exits are clearly marked and staffed with trained personnel, theaters can provide their patrons with a safe and secure environment. Overall, the implementation of a one-way exit system in movie theaters is a practical and necessary step towards improving the movie-going experience for all patrons.

4.2 Future work:

- As the implementation of a one-way exit system in movie theaters using queues is still a relatively new concept, there is a great deal of room for future work and improvement. Some possible areas for future work include:
- **Optimizing queue design:** As the number of theater-goers and the frequency of movie screenings increases, the queue design can be further optimized to minimize wait times and improve the overall flow of patrons.
- **Incorporating technology:** The use of technology such as digital signage and real-time monitoring systems can help theaters manage their queue more effectively and provide patrons with updated information on wait times.

- **Improving emergency preparedness:** The implementation of a one-way exit system in theaters can also improve emergency preparedness by providing a clear and well-defined evacuation route in case of an emergency.
- **Measuring the effectiveness:** It will be important to regularly measure the effectiveness of the one-way exit system using metrics such as wait times, patron satisfaction, and evacuation times in emergency situations. This information can then be used to make further improvements to the system.
- **Integrating with other safety measures:** The one-way exit system can be integrated with other safety measures such as fire alarms, emergency lighting, and crowd management systems to provide a comprehensive safety solution for movie theaters.