

Voting process(Queue)

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Introduction :

➤ **Purpose of the Project:**

Simulate a real-world voting system using a queue data structure.

➤ **Why Queue?**

First-In-First-Out (FIFO) principle ensures fairness in voting.

➤ **Key Features:**

- Enqueue voters.
- Dequeue after voting.
- Track vote count securely.

What is a Queue ?

- Definition: Linear data structure following First In First Out (FIFO) principle.
- Elements added at the rear, removed from the front.
- Real-life analogy: People standing in a line to vote.

Queue operations:

- ❑ Main operations:
 - enqueue(): Add element to rear
 - dequeue(): Remove element from front
 - isEmpty(): Check if queue is empty
 - isFull(): Check if queue is full
- ❑ Front and Rear pointers manage queue state

Why we use a queue in voting systems?

- Ensures orderly processing of voters (first-come, first-served).
- Prevents multiple voting by same person.
- Simplifies vote counting by sequential processing

System requirements:

- C programming language.
- Basic knowledge of arrays and structures.
- Console-based interface for demonstration.

System design overview:

- Voters register and are added to the queue.
- Each voter votes when their turn arrives (dequeued).
- Votes are recorded and tallied- Results displayed after all voters have voted.

Data structures used:

- Queue implemented using array.
- Structure for voter details:
 - Voter ID, Name, Voted (Yes/No), Vote (Candidate ID).
 - Array to store votes for each candidate.

Vote registration:

- Voter provides details (ID, Name).
- Added to the queue using enqueue().
- Only registered voters can vote.

Voting process:

- Voter dequeued when their turn arrives.
- System checks if voter has already voted.
- Voter selects candidate; vote recorded- Prevents double voting.

Vote counting:

- After all voters have voted, system tallies votes.
- Array stores count for each candidate.
- Results displayed to user.

Output example:

- Show sample input/output:
 - Voter registration.
 - Voting process.
 - Final vote tally.

Advantages of Queue-Based on voting system:

- Simple, fair, and prevents manipulation.
- Easy to implement and debug.
- Scalable for larger elections.

Limitations and improvements:

- Limited by queue size (array implementation).
- No real-time authentication in console version.
- Can be extended with linked list for dynamic size.

Concluion:

- Queue ensures fair, sequential voting.
- C implementation demonstrates core data structure concepts.
- Foundation for more advanced, secure voting systems.

Thank you