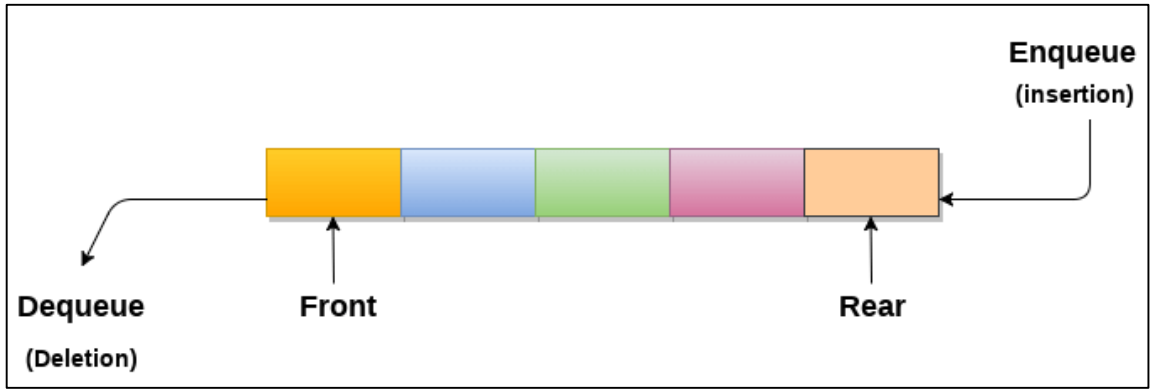
Queue

- A queue can be defined as an ordered list of elements in which insert operations to be performed at one end called REAR and delete operations to be performed at another end called FRONT.
- Queue is referred to be as FIFO (First-In-First-Out) list.
- For example, people waiting in line for a rail ticket form a queue.



Queue Operations

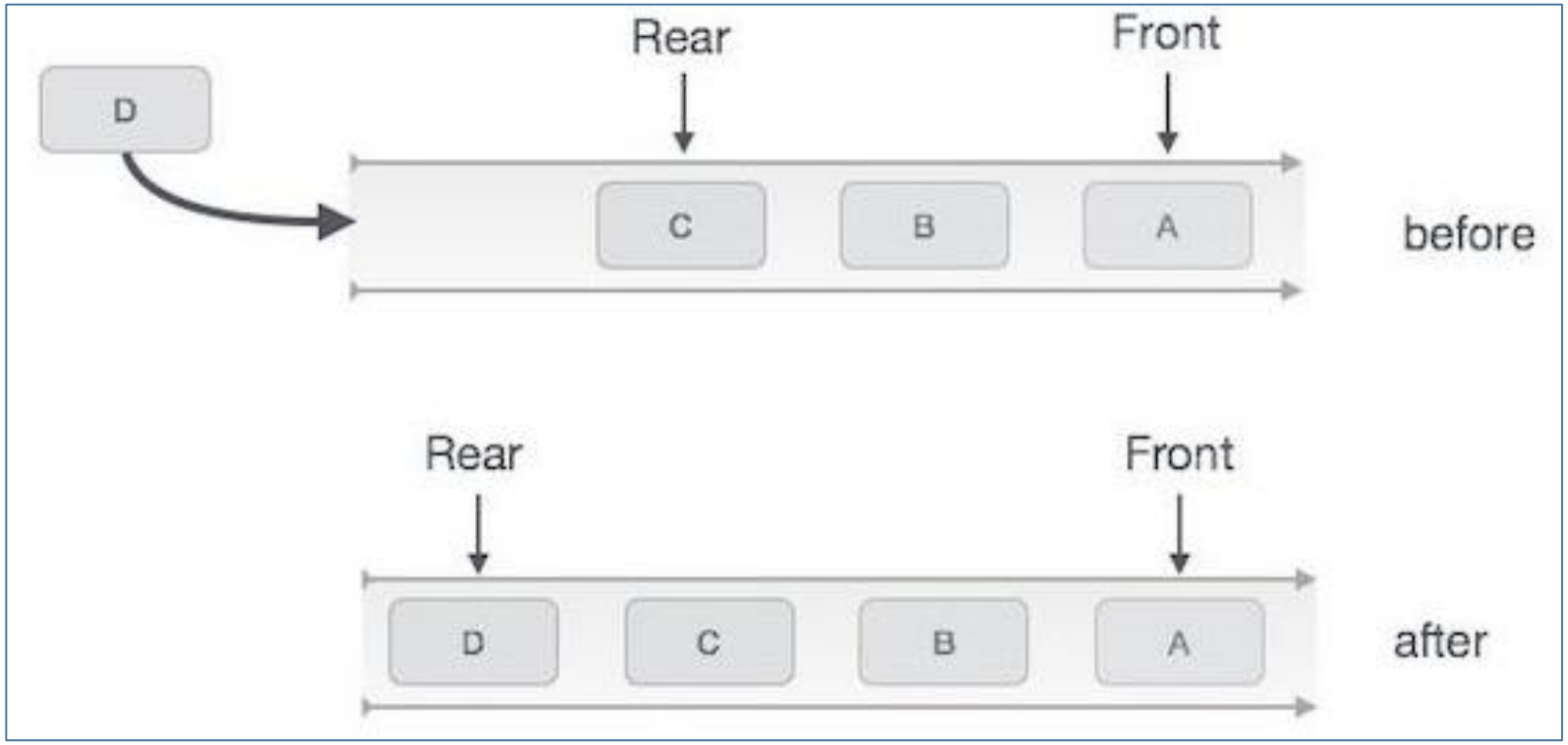
- Enqueue() – Insert (add) an item to the queue.
- Dequeue() – Delete (remove) an item from the queue.

Enqueue Operation

The following steps should be taken to enqueue (insert) data into a queue -

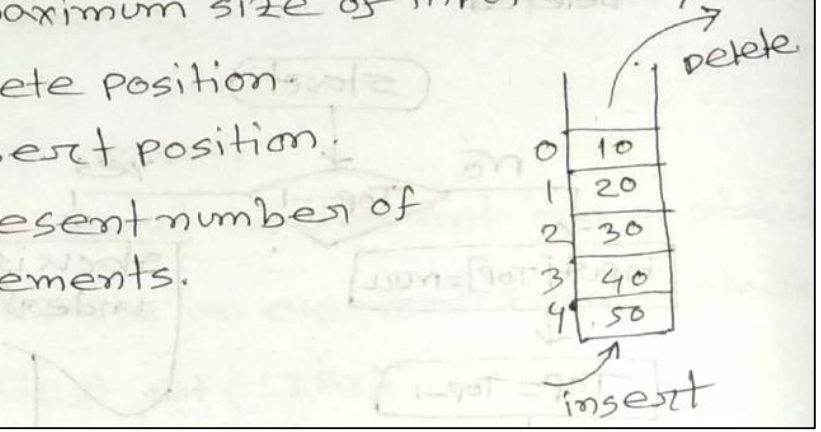
- Step 1 − Check if the queue is full.
- Step 2 − If the queue is full, produce overflow error and exit.
- Step 3 − If the queue is not full, increment rear pointer to point the next empty space.
- Step 4 − Add data element to the queue location, where the rear is pointing.
- Step 5 − return success.

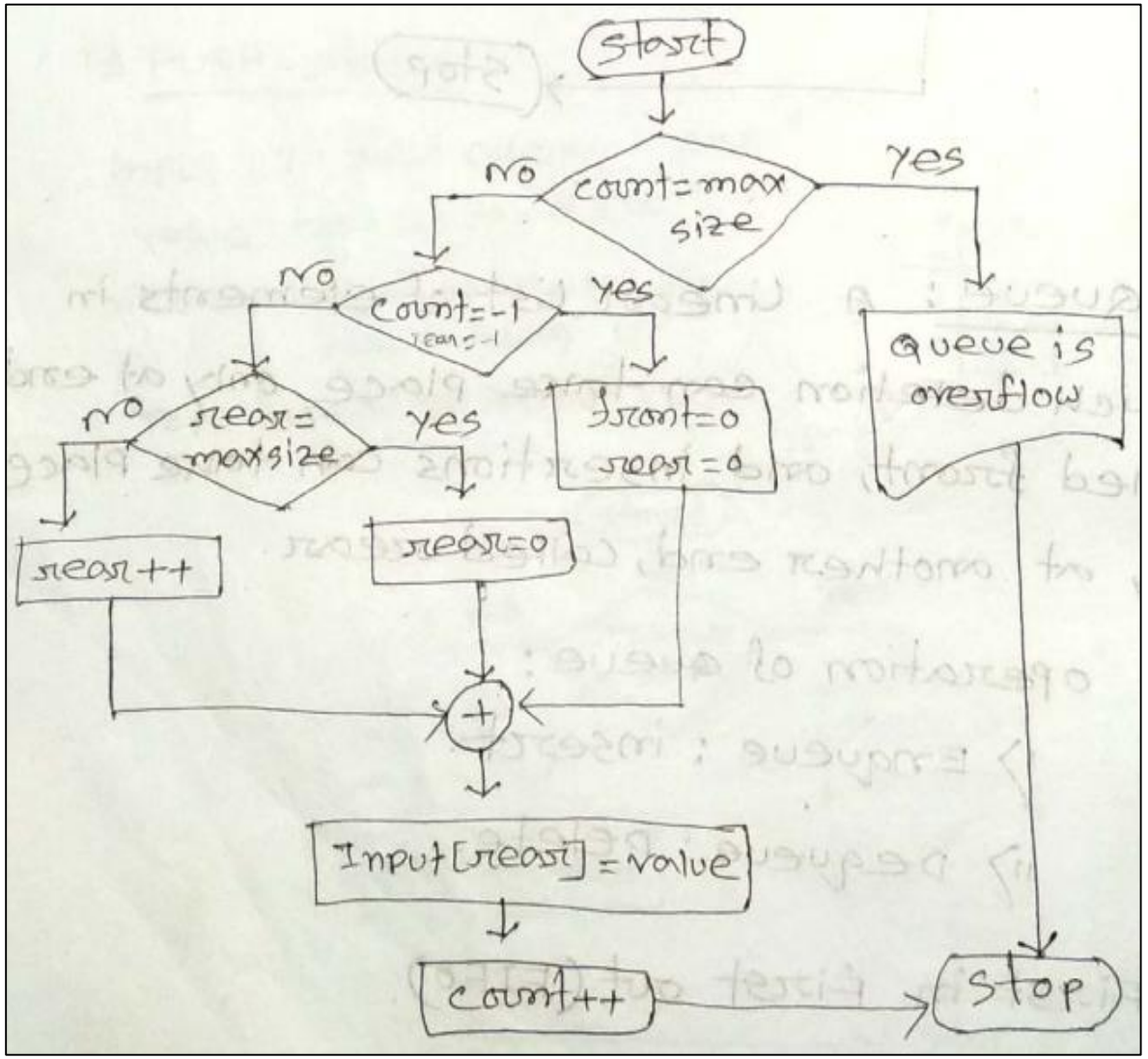
Enqueue Operation: Cont…



Flowchart of Enqueue Operation

input[] : input array.
value : inserted value.
maxsize : maximum size of input array.
front : Delete position.
rear : insert position.
count : Present number of elements.
initial -1 for empty



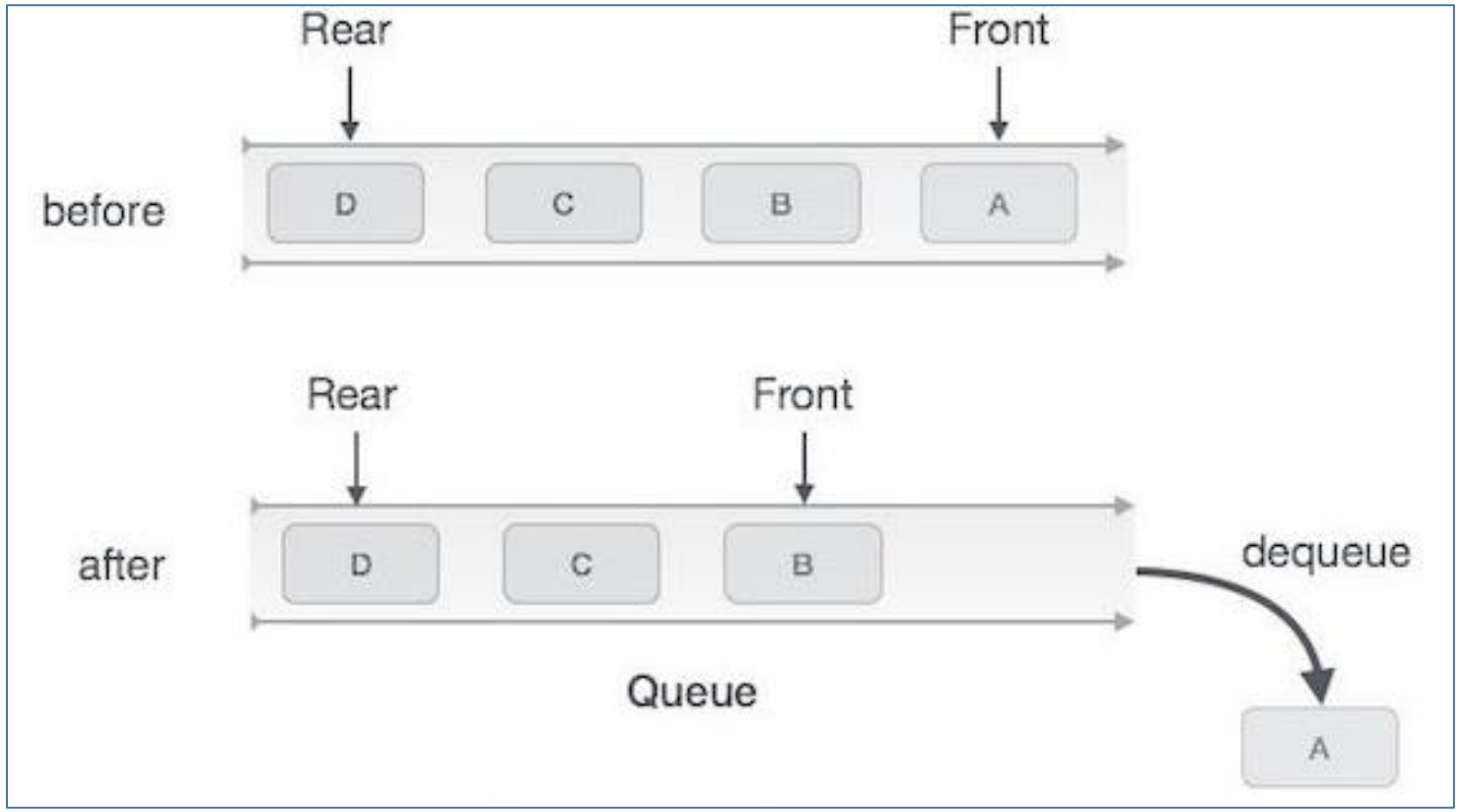


Dequeue Operation

The following steps are taken to perform dequeue operation −

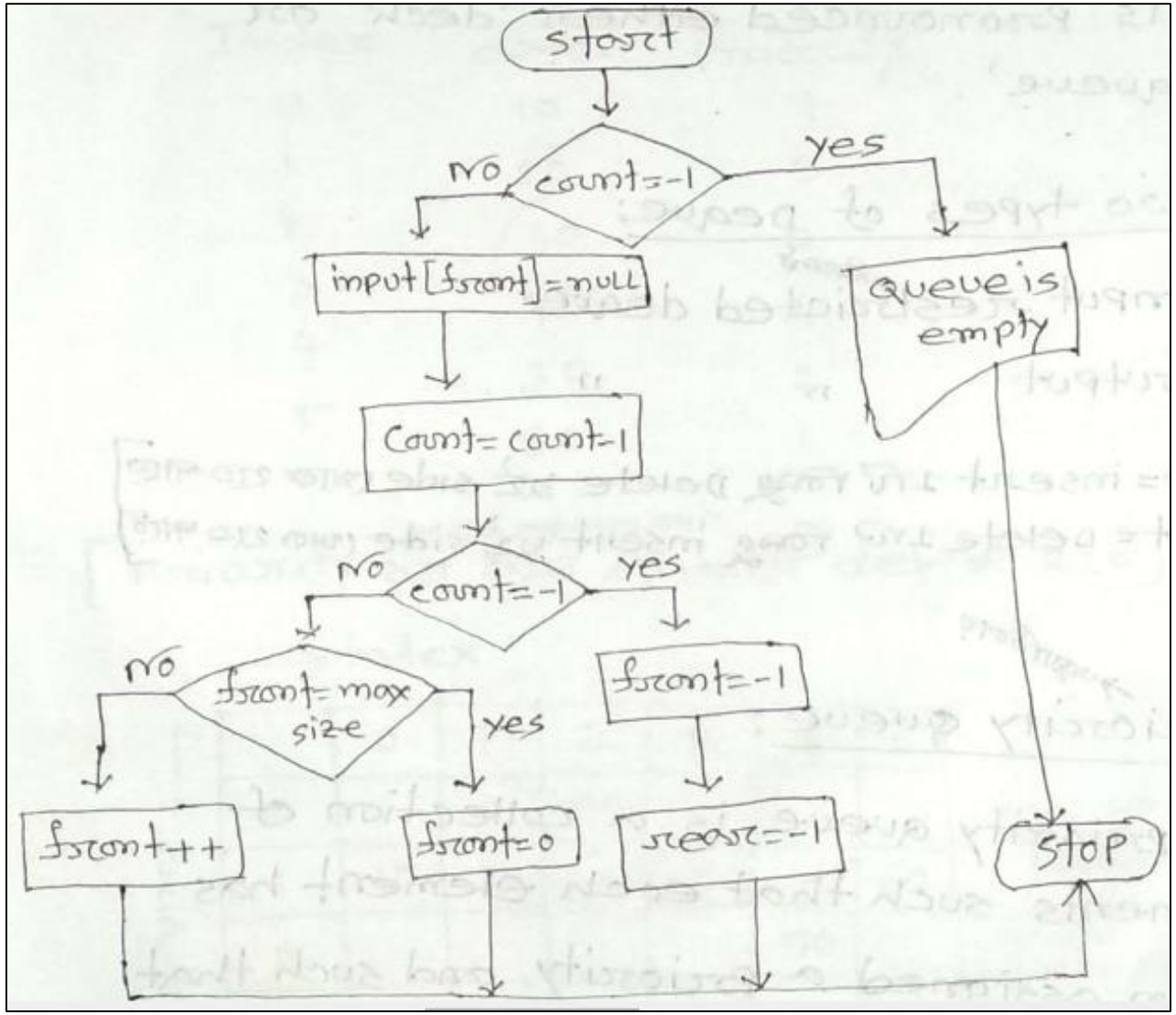
- Step 1 − Check if the queue is empty.
- Step 2 − If the queue is empty, produce underflow error and exit.
- Step 3 − If the queue is not empty, access the data where front is pointing.
- Step 4 − Increment front pointer to point to the next available data element.
- Step 5 − Return success.

Dequeue Operation: Cont…



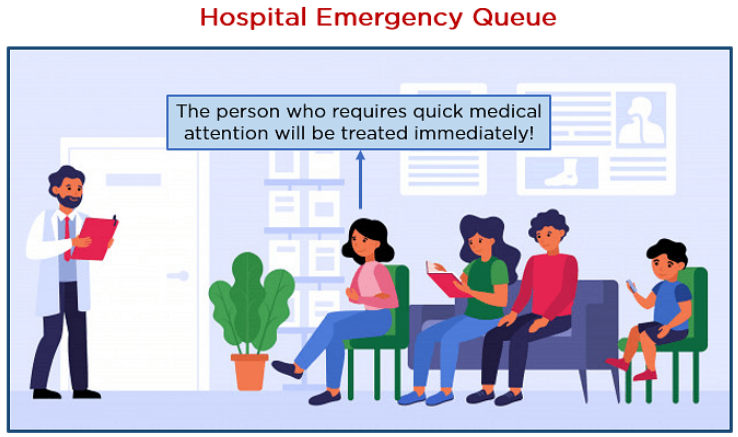
Flowchart of Dequeue Operation

input [] : input array
count : number of element
front : delete index.
rear : input index.
max size : maximum size of input array



Application of Queue

- Maintaining the playlist in media players.
- Buy a movie ticket.
- Vehicles on toll-tax bridge
- A single-lane one-way road.
- Waiting lists for a single shared resource like printer, disk, CPU.
- Call Center phone systems use Queues to hold people calling them in order, until a service representative is free.



Advantage and Disadvantage of Queue

❑ *Advantages*

- Able to manage large amounts of data, as well as being quick and flexible.
- Able to handle a variety of data kinds and being both flexible and speedy.

❑ *Disadvantages*

- The need to delete other elements in order to add a new element to the queue.
- There is no easy way to search the queue.
- It's also difficult to add or remove pieces from the midst of the queue.