Program Studi Teknologi Informasi, Fakultas Teknik
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Algoritma dan Struktur Data

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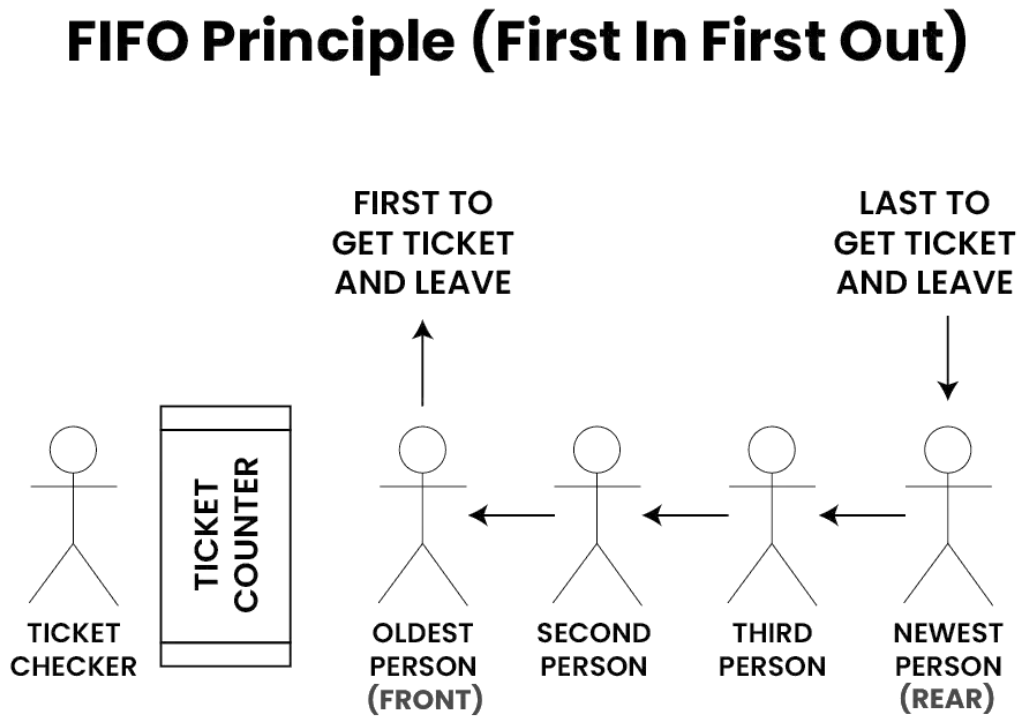
Data Structures and Algorithm
Objective

- Queue

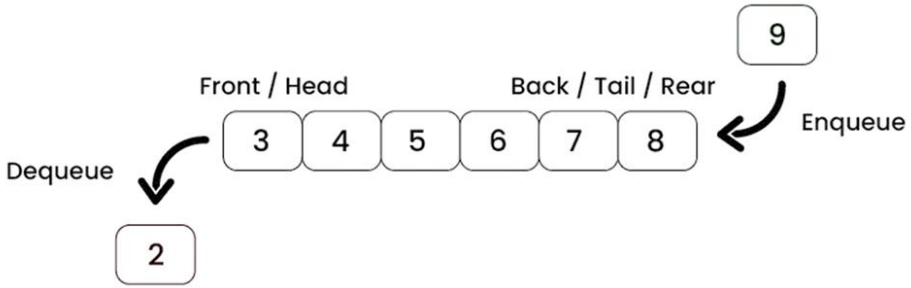
Data Structures and Algorithm
Queue

- Queue is a linear data structure that follows FIFO (First In First Out) Principle, so the first element inserted is the first to be popped out.



Data Structures and Algorithm
Queue

- Operations on Queue:
  - **Enqueue/Insert:** Adds an element to the end (rear) of the queue. If the queue is full, an overflow error occurs.
  - **Dequeue/Delete:** Removes the element from the front of the queue. If the queue is empty, an underflow error occurs.
  - **Front:** Returns the element at the front without removing it.
  - **Rear:** Returns the number of elements in the queue.
  - **isEmpty:** Returns true if the queue is empty, otherwise false.
  - **isFull:** Returns true if the queue is full, otherwise false.



Data Structures and Algorithm
Queue (Array)

Insert Operation

- If the queue is empty:
  - Set FRONT = 0.
- Increment REAR by 1.
- Store the element at index position REAR in the array.

Data Structures and Algorithm
Queue (Array)

Delete Operation

- Retrieve the element at index FRONT.
- Increment FRONT by 1.

Data Structures and Algorithm
Queue (Circular Array)

Insert Operation

- If the queue is empty (If FRONT= –1):
  - Set FRONT = 0
  - Set REAR = 0
  - Go to step 4

- If REAR is at the last index position:
  - Set REAR = 0
  - Go to step 4

- Increment REAR by 1

- Queue[REAR] = element

Data Structures and Algorithm
Queue (Circular Array)

Delete Operation

- If there is only one element in the queue:
  - Set FRONT = –1
  - Set REAR = –1
  - Exit

- If FRONT is at the last index position:
  - Set FRONT = 0
  - Exit

- Increment FRONT by 1

Data Structures and Algorithm
References

- https://www.geeksforgeeks.org/
- https://www.tutorialspoint.com/

Any Question ?