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VII

Queueing Theory

- * A Queueing System can be completely described by the way in which queue is formed.
- * The way in which server serves.
- * The Queue discipline.
- * " " behaviour

*1 The way in which queue is formed is also known as input pattern or arrival pattern. usually customers arrive at a service station in a random way. The arrival of customers is in general probabilistic.

To study the queueing system we must know about the probability distribution of the inter arrival time.

we consider queueing systems in which customers arrive in poisson fashion

*2 Service pattern: it is also known as service mechanism. we consider the availability of one server to serve the customers in the queue. The time taken to serve a customer is referred to as service time and it is in general a random variable. The service time distribution is taken as -ve exponential distribution.

*3 The queue discipline :- The way in which the customers in the queue are served is known as Queue discipline.

The usual type we come across is "First Come First Served" (FCFS) / (FIFO).
The Queue discipline may also be in "LIFO".
There is also a possibility that service may be on priority basis. This queue discipline is termed as priority queue.

* 4 Queue Behaviour: The customer behaviour concerning the queue is known as Queue behaviour. A customer may not enter the queue in view of its length. This customer behaviour is called as balking.

Sometimes a customer who is in the queue for long time due to impatience may leave the queue. This customer behaviour is called as renegeing.

Sometimes a customer who is in one queue may leave the queue and join another queue. This customer behaviour is called jockeying.

Note: If the behaviour of the queueing system depends on time the system is said to be in transient state.

* A queueing system which is independent of time is called as steady state of the system.