Lecture

NOTE: FOR FURTHER DETAILS AND MORE COMPREHENSIVE STUDY, PLEASE SEE RECOMMENDED BOOKS OR INTERNET.

Queue

Queue is a linear data structure in which the insertion and deletion operations are performed at two different ends. In a queue data structure, adding and removing elements are performed at two different positions. The insertion is performed at one end and deletion is performed at another end. Queue works on the principal of ***FIFO***.

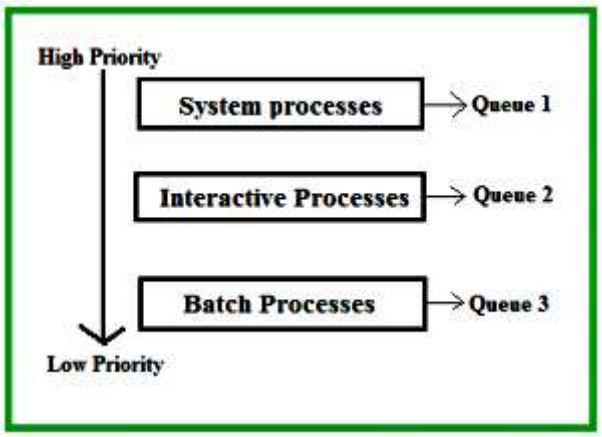
Application of Queues

Implementation of a queue is also an important factor in IT sector. Queue performs Job scheduling of CPU in Operating Systems to the buffers in Networking. Resource allocation to customer services in industry.

Job/Process Scheduling:

Nowadays computer handles multiuser, multiprogramming environment and time-sharing environment. In this environment a system handles several jobs at a time; to handle these jobs the queue is used. It may happen that processes in the ready queue can be divided into different classes where each class has its own scheduling needs. For example, a common division is a **foreground (interactive)** processes and **background (batch)** processes. These two classes have different scheduling needs. For this kind of situation Multilevel Queue Scheduling is used where priority is implemented. Now, let us see how it works.

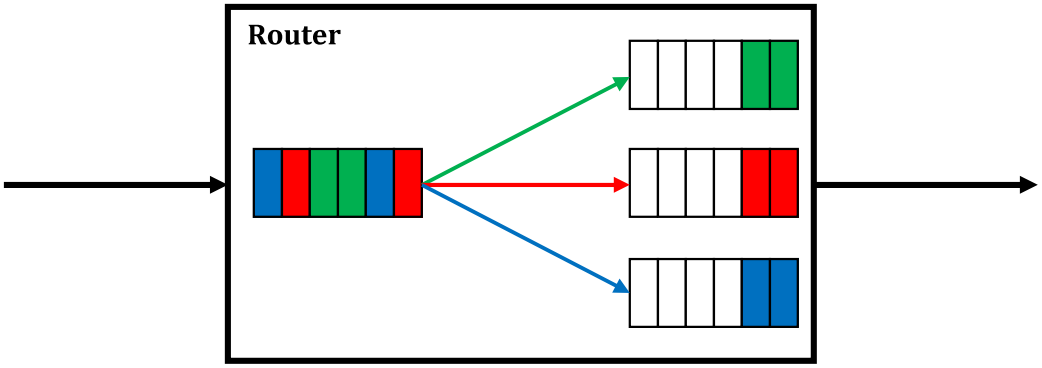
Ready Queue is divided into separate queues for each class of processes. For example, let us take three different types of process: ***System processes***, ***Interactive processes*** and ***Batch Processes***. All three types of processes have their own queue.



Buffers:

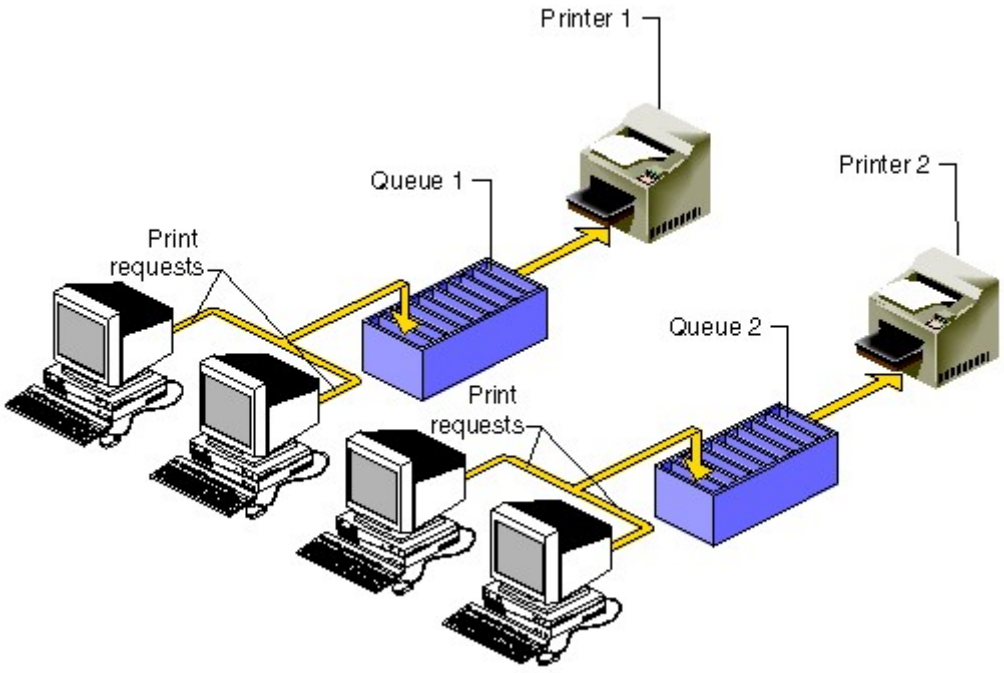
A Buffer is a region of physical memory storage (queue) used to temporarily store data while it is being moved from one place to another. Typically, the data is stored in a buffer as

it is retrieved from an input device (such as a audio/video) or just before it is sent to an output device (such as speakers/screen). However, a buffer may be used when moving data between processes within a computer. This is comparable to buffers in telecommunication where one systems sends data to other and while the other systems receives and decode data it saves it in a temporary space based on queues.



Spooling:

Spooling is a specialized form of queue for the purpose of temporary holding data between different devices. it is usually used for mediating between a computer application and a slow peripheral, such as a ***printer***. Spooling allows programs to "hand off" work to be done by the peripheral and then proceed to other tasks. A dedicated program, the spooler, maintains an orderly sequence of jobs for the peripheral and feeds it data at its own rate.



There are many other uses of queues in computer sciences field that you will study in detail in other courses such as ***Operating Systems*** and ***Computer Networks*** and many others.