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Kernel is a computer program that is a core or heart of an operating system.

Kernel is the core part of an OS (Operating system); hence it has full control over everything in the system. Each operation of hardware and software is managed and administrated by the kernel.

It acts as a bridge between applications and data processing done at the hardware level. It is the central component of an OS.

It is the part of the OS that always resides in computer memory and enables the communication between software and hardware components.

We briefly describe several fundamental data structures used extensively in operating systems.

- The following are Different types of Kernel data structures are:
- **Array:** An array is a simple data structure in which each element can be accessed directly.
- **In a singly linked list**, each item points to its successor.
- **In a doubly linked list**, a given item can refer either to its predecessor or to its successor.
- **In a circularly linked list**, the last element in the list refers to the first element, rather than to null.
- **A stack** is a sequentially ordered data structure that uses the last in, first out (LIFO) principle for adding and removing items, meaning that the last item placed onto a stack is the first item removed. The operations for inserting and removing items from a stack are known as push and pop, respectively.

- **A queue**, in contrast, is a sequentially ordered data structure that uses thefirst in, first out (FIFO) principle: items are removed from a queue in the orderin which they were inserted.
- **A tree** is a data structure that can be used to represent data hierarchically. Datavalues in a tree structure are linked through parent–child relationships. In ageneral tree, a parent may have an unlimited number of children.
- **In a binary tree**, a parent may have at most two children, which we term the left childand the right child.
- **A binary search tree** additionally requires an orderingbetween the parent's two children in which le f t child <= right child.
- A **hash function**takes data as its input, performs a numeric operation on this data, and returns a numeric value. This numeric value can then be used as an index into a table (typically an array) to quickly retrieve the data. Whereas searching for a data item through a list of size *n* can require up to *O*(*n*) comparisons in the worst case, using a hash function for retrieving data from table can be as good as *O*(1) in the worst case, depending on implementation

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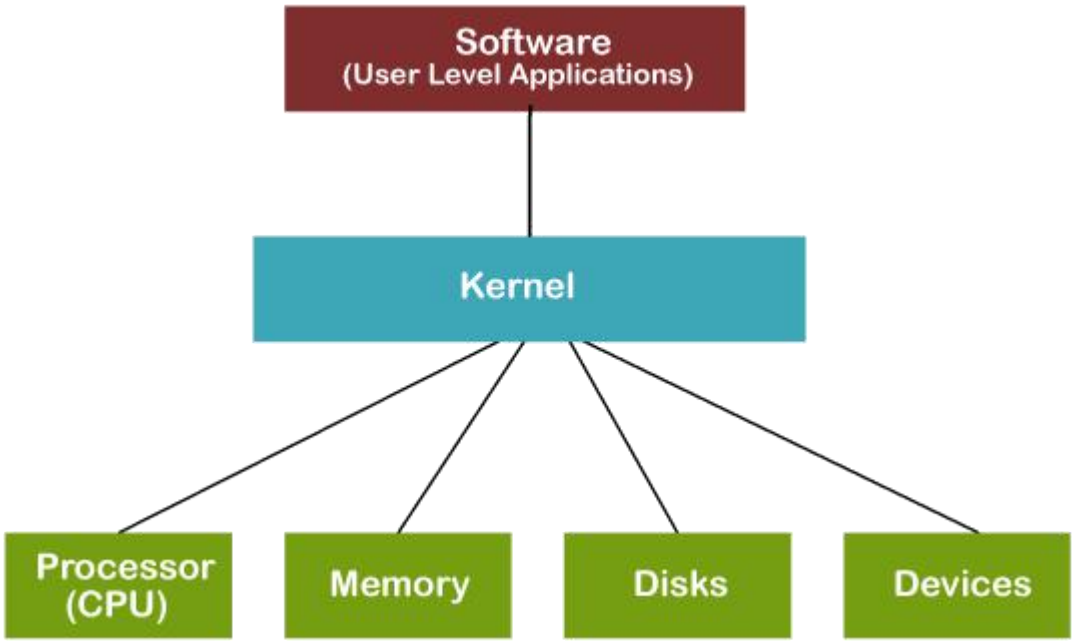
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