

The data structures store the data according to the mathematical or logical model it is based on. The type of operations on a certain data structure makes it useful for specific tasks.

Interrupts generated by the user applications for CPU Calls handled by the customers in BPO

Trees Implementing the hierarchical structures in computer systems like directory and file system

Implementing the navigation structure of a website

Code generation like Huffman's code

Decision making in gaming applications

Implementation of priority queues for priority based OS scheduling functions

Parsing of expressions and statements in programming language compilers

For storing data keys for DBMS for indexing

Spanning trees for routing decisions in computer and communications networks

Hash trees path-finding algorithm to implement in AI, robotics and video games applications

Graphs Representing networks and routes in communication, transportation and travel applications

Routes in GPS

Interconnections in social networks and other network based applications

Mapping applications

Ecommerce applications to present user preferences

Utility networks to identify the problems posed to municipal or local corporations

Resource utilization and availability in an organization

Document link map of a website to display connectivity between pages through hyperlinks

Robotic motion and neural networks

These are a few applications of data structures to make appropriate storage and management of data for specific applications.

Stacks

Temporary storage structure for recursive operations

Auxiliary storage structure for nested operations, function calls, deferred/postponed functions

Manage function calls

Evaluation of arithmetic expressions in various programming languages

Conversion of infix expressions into postfix expressions

Checking syntax of expressions in a programming environment

Matching of parenthesis

String reversal

In all the problems solutions based on backtracking.

Job scheduler operations of OS like a print buffer queue, keyboard buffer queue to store the keys pressed by users

Job scheduling, CPU scheduling, Disk Scheduling

Priority queues are used in file downloading operations in a browser

Data transfer between peripheral devices and CPU.

Arrays

Storing list of data elements belonging to same data type

Auxiliary storage for other data structures

Storage of binary tree elements of fixed count

Storage of matrices

Linked List

Implementing stacks, queues, binary trees and graphs of predefined size.

When a user uses the alt+tab key combination to browse through the opened application to select a desired application

Doubly linked list is used in the implementation of forward and backward buttons in a browser to move backwards and forward in the opened pages of a website.

Polynomial implementation for mathematical operations

Circular linked list is used to implement OS or application functions that require round robin execution of tasks.

Implement dynamic memory management functions of operating system.

Circular linked list is used in a slide show where a user wants to go back to the first slide after last slide is displayed.

Circular queue is used to maintain the playing sequence of multiple players in a game.

Operating System functions

UNDO and REDO functions in an editor.

Used in depth first search in graph and tree traversal.

Queues

It is used in breadth search operation in graphs.

Here is a brief .discussion of different applications of data structures