

Applications of Data structures in Real Life

For Interviews



Application of Arrays

“**Array** is a data structure where values or items are placed in a linear order”

- **Sudoku or Chess Board are 2Darrays.**
- **In an online exam question paper numbering.**
- **Storing Book titles in a Library Management System.**
- **Online restaurant menu.**
- **Contacts in a cell phone.**
- **Your viewing screen is also a multidimensional array of pixels.**

Application of Linked Lists

“A **linked list** is a sequence data structure which connects its nodes through links”

- Web pages can be accessed using the previous and the next URL links
- Social media content “feeds”.
- To keep the track of turns in a multi-player game, a circular linked list is used.
- Images are linked with each other. So, an image viewer software uses a linked list to view the previous and the next images.

Application of Stack

“A **stack** is a data structure that uses Last Input-First Output order”

- **Undo/Redo button/operation** in word processors.
- **Forward-backward surfing** in the browser.
- **History of** visited websites.
- **Message logs and all messages you get are arranged in a stack.**
- **Loading bullets into the magazine of a gun. The last one to go in is fired first. Bam!**

Application of Queue

“A **queue** is a data structure that uses First Input-First Output order”

- **Sending an e-mail, it will be queued.**
- **Server while responding to request**
- **Printer spooler.**
- **Operating System uses queues for job scheduling.**
- **Handling website traffic.**
- **Data packets in communication are arranged in queue format.**

Application of Graphs

“**Graph** is a data structure where data is stored in connected nodes with edges”

- All social media networking sites where every user is a Node.
- Graphs can be used to model transportation systems to find the shortest route between locations.
- Recommendation Engines where graphs represent and analyze social networks, such as the connections between individuals and groups.
- Google map to find nearest location.
Facebook to suggest mutual friends

Application of Trees

“Trees are hierarchical structures with parent and child nodes”

- File explorer/my computer of mobile/any computer
- Domain Name Server(DNS) uses tree structures.
- To store the genealogy information of biological species.
- XML Parser uses tree algorithms.
- Posting questions on websites like Quora, the comments are like child of questions.

Application of Strings

“A **string** is a data structure that represents a sequence of characters”

- To store textual information like names, addresses, and messages.
- Searching and manipulating data in search engines, text editors.
- Formatting, displaying information in user interfaces, web pages.
- Cryptography and hashing such as encrypting and decrypting data
- Error handling, logging to provide descriptive error messages.

Application of Hash Tables

“Hash Tables store data in key-value pairs”

- Hash tables can be used to identify duplicate records in large datasets.
- Databases uses hash table to store the index of column for efficient lookup and retrieval of records.
- Compilers uses symbol tables to keep track of variables, functions, and other program entities.
- Spell checker, language processing tools often uses hash tables to store and search for dictionary words.

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