

Data structures are methods of organizing and storing data to enable efficient access and modification. They are fundamental to computer science and software engineering, influencing algorithm design and system performance.

Linear data structures include arrays, linked lists, stacks, and queues. Arrays store elements in contiguous memory locations, enabling fast access by index. Linked lists consist of nodes connected by pointers, allowing dynamic memory allocation.

Non-linear data structures include trees and graphs. Trees represent hierarchical relationships and are widely used in databases and file systems. Graphs model complex networks such as social connections and communication systems.

Choosing the appropriate data structure depends on the problem requirements. Factors such as memory usage, access time, and update efficiency must be considered. Mastery of data structures enables developers to write efficient and scalable programs.