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I.1 Assignment

(1) Write a brief note on DSA along with its importance.

DSA or Data Structures and Algorithams, forms the fundamental building blocks of computer science and play a critical role in the development of efficient & scalable software solutions.

→ Data structures refers to the organization and storage of data in a computer's memory, while algorithams are step by step procedure or formulas for solving problems and performing.

→ Together they enable programmers to design and implement efficient solutions to complex computational problems.

Importance:

1. Optimized performance:
   Efficient algorithams are crucial for optimizing the performance of software. DSA enables the selection of appropriate data structure and algorithm to achive optimal time & space complexity

2. Problem solving

DSA provides a systematic approach to problem solving. It helps programmers understand the nature of problems & design efficient solutions.

3. Algorithmic Thinking

DSA enhances algorithmic thinking, enabling programmers to device logical and effective solutions. It encourages the development of a structured thought process when tackling computational problems.

4. Code Reusability

Proficiency in DSA facilitates the creation of modular and reusable code. Well-designed data structure and algorithms can be applied to different problems with minimal modification.

5. Interviews & Competition

It's a crucial aspect of technical interviews for software engineering positions. Many tech companies asses conditions based on their ability to solve algorithmic and data structure related programs.

6. Scalability

DSA plays a pivotal role in designing scalable systems, systems that are expected to handle large amount of data or requests next well-designed (optimized) algorithams and data structures to maintain performance.

2. What is Data staues? Explain with its types.

A data structure is a way of organizing & storing data in a computer so that it can be used efficiently.

→ It defines a set of operations that can be performed on the data, as well as the relationships between the data elements.

→ The choice of a particular data structure depends on the type of problem being solved and the operations that needs to be performed on the data.

Types:

- → Arrays
- → Linked Lists
- → Stacks
- → Ques
- → Trees
- → Graph
- → Hash Tables
- → Heaps