**CS301 GDB Fall 2021**

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**GDB Scenario:**

A hospital that is technologically well equipped and everything is being managed well in a smooth way. The massive routine administrational activities, routine patient admissions and investigations are carried out on a frequent basis. Mainly this hospital treats psychologically ill and paralysed patients. Always there remains a very high ratio of these patients for their follow-up visits as compared to new admissions. Due to heavy and large-scale provision of services, there remains a problem to manage the patient’s appointment for revisit whose treatment duration is long. Because of this high threshold of revisits/follow-up patients, the system needs to be optimized to perform efficiently. For this purpose, they need a system upgrade which could make a fast search of the recent patients for giving them the follow-up/revisit time. The system must have smooth performance, efficient memory usage and manipulations (insertion, deletion, search) of data.

**GDB Question:**

From doubly linked list and singly linked list data structures which data structure(s) you will choose for the upgradation of the system? Select data structure(s) and support your answer to justify it.

You need to only discuss which data structure(s) is/are suitable. Code is not required.

**Answer:**

The most suitable data structure for the upgradation of the system is **doubly link list** data structure. As described in GDB Scenario, due to heavy and large-scale provision of services, there remains a problem to manage the patient’s appointment for revisit whose treatment duration is long. The only solution for this scenario is to optimized system to perform efficiently.

**Doubly Link List DS:**

*“Doubly-link list uses two pointers(patients) in the node. One to point to next or new patients(node) and the other one is to point to the previously admitted patients(node)”.*

*There are three parts of doubly link list data structure:*

1st part is for previously admitted patients(node).

2nd or center part is element or node.

3rd part is newly admitted patients(node).

**Advantages of Doubly Link List:**

* By using doubly link list, the follow-up routine of the psychologically ill and paralyzed patients revisit can be managed and optimized effectively and easily.
* By using doubly link list, the searching process is fast to search the new admitted patients as well as recent patients for giving them the follow-up/revisit time.
* By using doubly link list, the system will have smooth performance, efficient memory usage and manipulations in insertion, deletion and searching of data.