| **Data Structure Workouts** |
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| 1. Learn what is Data Structure & Algorithms. 2. Learn the basics of Memory Allocation and Memory leak. 3. Learn the concept of Complexity Analysis.   NB: The complexity of common operations of all data structures should be covered.   1. Learn about Asymptotic analysis (Big-O notation). 2. Learn the concepts of Array. Complete at least three sample workouts & do at least 3 problems from any competitive coding websites (Hacker Rank, Code Chef, Leet code, Algo Expert, etc.) 3. Learn the concepts of the Linked list. Complete at least three sample workouts    1. Construction of Singly linked list & Doubly linked list.    2. Convert array to a linked list    3. Add a node at the end & beginning    4. Delete node with the value specified    5. Insert a node after & before a node with x data    6. Print all elements by order & reverse by order    7. Write a program to remove duplicates in a sorted singly linked list 4. Learn the concepts of String. Complete at least three sample workouts.   Eg: Write a function to replace each alphabet in the given string with another alphabet occurring at the n-th position from each of them.   1. Learn about Linear Search & Binary Search. Complete at least 3 sample workouts in each of them 2. Learn the concepts of Recursion. Complete at least 3 sample workouts. 3. Learn about the applications of all structures you covered this week |
| *Learning about data structure and algorithms is my first task this week. I start with basics of data structure from the brototype tutorial and GeeksForGeeks. These both tutorials have helped me a lot to understand the concepts of data structure and algorithm. This is my first time watching this type of hard topic. First time I watched a tutorial video I couldn't understand the concepts of data structure. And this time I have doubts to clear and there are some concepts I still didn’t understand. So the Data structure is difficult for me.* |
| *Learning about the concepts of memory allocation and memory leak is my second task in this Data Structure first week. This topic is really interesting. I refer to some docs and videos. There are two types of memory allocation in programming, runtime and compile time. There are no videos found related that garbage collectors can't find every memory leak and developers should take extra care when programming and avoid this situation where there is a memory leak.* |
| *After completing the memory allocation topic I just started the concept of complexity analysis is one of the tasks in data structure. This type of concept is very good for over-programming skill improvement. Whenever we start a career in the IT field, the first time wwe understand the concepts of programming we start to write a program with a lot of loops and variables. We don't use the short codes for reducing time complexity and space complexity. We are starting to write a program. We must create an algorithm and reduce the worst case. Worst case reduce to baste cas that is useful for you and our program much better fast and escape from bugs.* |
| *After completing complexity of programing I study about the big O notation that helps me to calculate the complexity of programs. Using these terms to understand my program time and space complexity . This task is really good for my programming skills. Now this big o notation is what an efficient programing user wants. So after learning about big o notation as a programmer we always need to make programs with the lowest complexity.* |
| *When I started using leetcode to improve my programming knowledge. This site is comfortable for me. This site has a lot of code questions. And it's made some new ideas and different types of coding metherd learned from leetcode.When I start using leetcode i also think about the complexity of my problems. Also I think this practice will help me in the process of building my programming skill and career. This task really helps and improves my confidence during writing a program.*  [*Array*](https://drive.google.com/drive/folders/1FIaIb-XJbQEW_POrDl1PPNw7IQe0OD-x?usp=share_link) |
| *This is a challenging task I did in the data structure first week. This week I spent most of my time doing this task. Now I realise that linked lists are a really interesting topic in data structure. When I start to understand the concepts of linking the nodes in data structure. Then after I work out some problems the Singly Linked list is to understand the concepts. The data structure topic is a large topic hard to study. Linked list is a complicated topic for a newbie in the IT field. I would like to do more problems with the linked list. That was really good for me.*  [*https://drive.google.com/drive/folders/15tJeEK2b-o6hDLmM3CRO1Ziz2FDWEC0k?usp=share\_link*](https://drive.google.com/drive/folders/15tJeEK2b-o6hDLmM3CRO1Ziz2FDWEC0k?usp=share_link) |
| *This is really hard to study in the data structure week. This task is giving more errors during programming. Most of the time I failed to do conversion. I Don't understand , so I am still trying to do some extra work on this topic. I know hard work is the best part for improving this concept so i will try my level best. The reason for understanding it is that we have only a short time period for studying. This is the biggest problem and we are starting a new week. We don't know which tutorial to follow to learn.*  [*https://drive.google.com/drive/folders/1oOM3s90GjE5nAMyxHpCn36LB2ihO8ilu?usp=share\_link*](https://drive.google.com/drive/folders/1oOM3s90GjE5nAMyxHpCn36LB2ihO8ilu?usp=share_link) |
| *This task is so impressive and good. The main reason for the linear search problem is that I remember my fumigation period. Through studying about searching I managed to study about the different ways to search an element in a sorted and an unsorted array. This actually takes only less time to study compared to the list and linked list problems. Day by day I'm feeling more interested about the data structure. I hope I complete the week in a better way.*  [*https://drive.google.com/drive/folders/1FIaIb-XJbQEW\_POrDl1PPNw7IQe0OD-x?usp=share\_link*](https://drive.google.com/drive/folders/1FIaIb-XJbQEW_POrDl1PPNw7IQe0OD-x?usp=share_link) |
| *Recursion is actually a tricky feature I think. I feel really interested when I start to study the recursion concept. Once you get the concept you can play with the recursion. It really helps to decrease the number of lines of our code. And it can be more efficient than the method of looping. Recursion has some disadvantages to solve some problems. Like its use of huge memory that is the one problem. And recursion using reduce the line of codes. When I start to use recursion, it's a bit tricky and I manage to study the concept by spending some time on it. Now I’m ok with the concept of recursion.*  [*https://drive.google.com/drive/folders/1KMWJJ0uw0ljovc5gXfzKW4pyzkzQLIkE?usp=share\_link*](https://drive.google.com/drive/folders/1KMWJJ0uw0ljovc5gXfzKW4pyzkzQLIkE?usp=share_link) |
| *Learning about the real life example is the last task in the data structure first week. First the application of arrays is mainly to store the contacts in mobile like the places where data are stored in order, also used to arrange the point table in sports like that. Next we have a linked list mostly doubly linked list. Singly linked lists are least used by the programmers. One of the examples is used to store web page urls when we go forward and we can easily use the arrow button and come back to the old pages. The other one is String, it is mostly used in search engines and also used for spell checking.* |