

Design Problem I

Course Code – CSE255 (Data Structures & Algorithms)

Section A1805

Problem Statement

The Real life applications are highly complex. But more complex than these applications are the technologies that support them. Technologies like latest application server frontend(s) and backend software and hardware platform(s). You may need to know all the technology at this point, but you still have to bear the struggle of at least understanding the philosophy behind it.

Data is omnipresent and is an integral part of any application. Data is stored in highly effective and organized structures which makes it possible for you to open your email account in a matter of few seconds. You need to understand the root foundations of designing any such data-structure and hence this project has its scope. For the purpose of this design problem, you are required to **make a List data structure**, which follows the properties of a **Linked-List** (i.e. it is *not* continuously stored in memory for efficient operations and memory management) but behaves like an array. The functionality of your Data-Structure should be defined by you depending on your skill set and experience in programming. You are free to choose any programming platform, however designing should be the main aspect of your problem solving. To exemplify, Imagine, you defining a class, which allows a user to store any element (i.e. any type of homogenous elements) and still allows a user to access an element through [] operator. Hence, allowing a user to use the functionality he is already familiar with while dealing with normal Arrays. Try and make the Data-Structure as robust and as flexible as possible. You are encouraged to define your own custom operators to increase the level of functionality offered by your Data-Structure.

Expectations

1. The students will research to understand basics of Data Structure.
2. The student should be able to design the basic operations and overload basic operators.
3. The student should introduce some amount of novelty and originality by introducing some advance level of functionality.
4. The data-structure designed will be at-least as efficient as those already defined on platforms like, Java Arraylist or C++ List.