Green University of Bangladesh

Department of Computer Science and Engineering (CSE)

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Course Code: CSE 106 Section: DF

Lab Project Name: "ALL IN ONE DATA STRUCTURES"

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[For Teachers use only: Don't Write Anything inside this box]

Lab Project Status

Marks: …… **Signature: .....**

Comments: ..... **Date: .....**

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Chapter 1
Introduction

1.1 Introduction

C is a procedural programming language. It was initially developed by Dennis Ritchie in the year 1972. It was mainly developed as a system programming language to write an operating system. The main features of the C language include low-level memory access, a simple set of keywords, and a clean style, these features make C language suitable for system programming's like an operating system or compiler development.
Many later languages have borrowed syntax/features directly or indirectly from the C language. Like syntax of Java, PHP, JavaScript, and many other languages are mainly based on the C language.

'C' is a powerful programming language which is strongly associated with the UNIX operating system. Even most of the UNIX operating system is coded in 'C'. Initially 'C' programming was limited to the UNIX operating system, but as it started spreading around the world, it became commercial, and many compilers were released for cross-platform systems. Today 'C' runs under a variety of operating systems and hardware platforms. As it started evolving many different versions of the language were released. At times it became difficult for the developers to keep up with the latest version as the systems were running under the older versions. To assure that 'C' language will remain standard, American National Standards Institute (ANSI) defined a commercial standard for 'C' language in 1989. Later, it was approved by the International Standards Organization (ISO) in 1990. 'C' programming language is also called as 'ANSI C'.

Why learn C Language?

As we studied earlier, 'C' is a base language for many programming languages. So, learning 'C' as the main language will play an important role while studying other programming languages. 'C' is a structured programming language in which program is divided into various modules. Each module can be written separately and together it forms a single 'C' program.

- It shares the same concepts such as data types, operators, control statements and many more.
- 'C' can be used widely in various applications. It is a simple language and provides faster execution.
- This structure makes it easy for testing, maintaining and debugging processes.
- 'C' contains 32 keywords, various data types and a set of powerful built-in functions that make programming very efficient.

1.2 Design Goals/Objective

The goal of the project is to build a Learning Program.

Here we will build a program for learning data structures and its things. It will not be a regular program where all kind of data structural problem are used and just solve the specific problem but it will be a learning program where the program itself will try to teach the user how the program actually works.

The main object for this project is to help different students and also different kind of people who wants to learn data structure in an easy way. This Program will help the user to understand the basic formula/theory of data structures and will learn how these data structures actually works. It's hard for us to find a tutor for a separate topic. So, my project program has come to solve the issue. It will simply show the steps that every data structures do for using their solutions.

Chapter 2

Screenshots

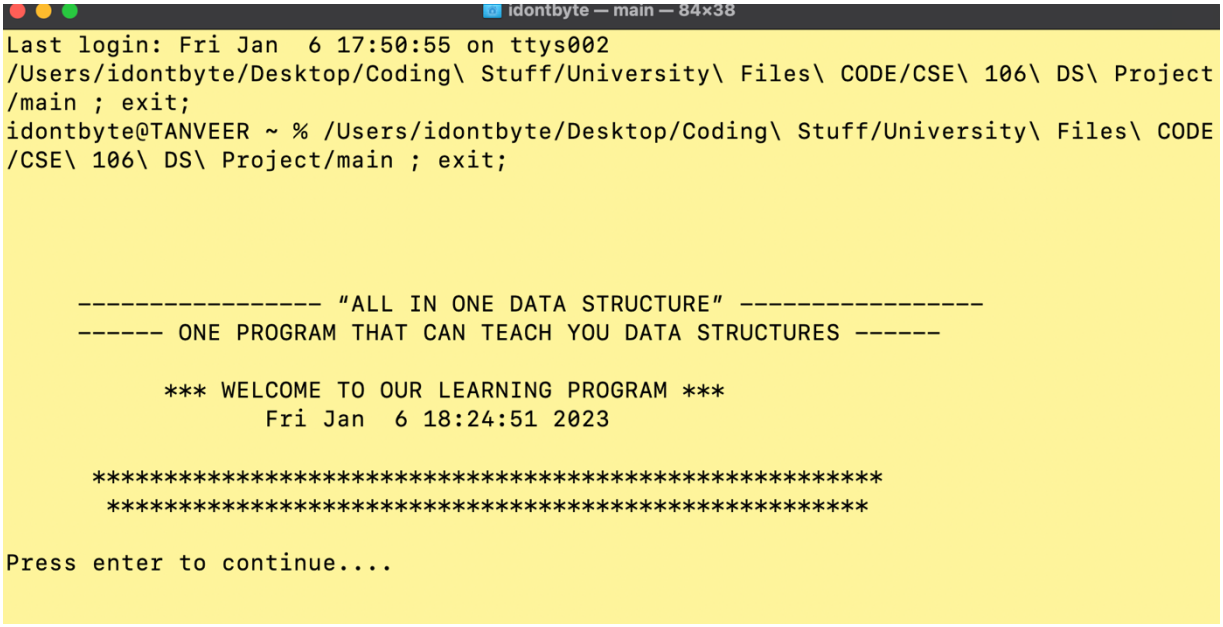

Figure 1: Intro of the Program

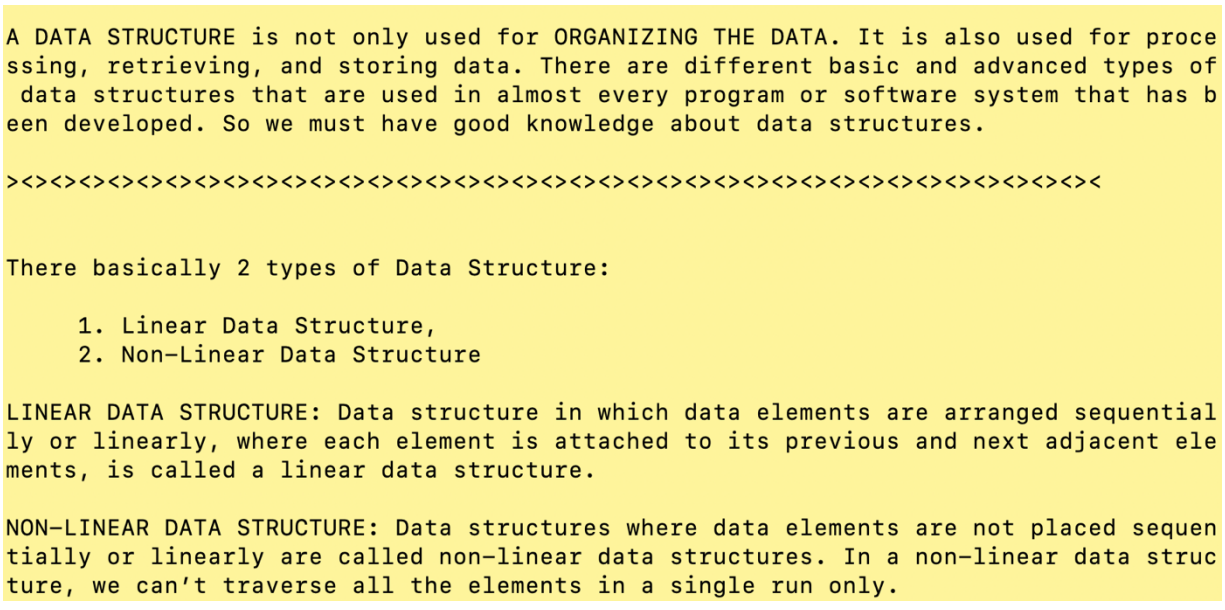

Figure 2: Theory of Data Structures

```
Choose any from the options below:

    1. Linear Data Structure
        << Searching, Sorting, Linked List, Stack, Queue >>
    2. Non-Linear Data Structure
        << Tree, Graph >>

Choice: 1

    Choose any from the options below:

        1. Searching (Linear/Binary)
        2. Sorting(Bubble/Insertion/Selection/Marge/Quick)
        3. Linked List (Singly/Doubly/Circular)
        4. Stack
        5. Queue

Choice: 1
```

Figure 3: First Chosen Options

```
There are basically two(2) types of searching method in Data Structure.

     These 2 types are:
        1. Linear Search,
        2. Binary Search

Choose any of them to see it's working formula: 2
Enter the amount of element: 4

Enter the element one by one: 1 2 3 4

For use the binary search, the given data base should be sorted first,,, So for th
is our given data base will be sorted via a easy sorting algorithm which is bubble
 sort (User can use any kind of algorithm here)

Enter the value to search through Binary Search: 3


 Now as per the algorithm we will set a value for 'Lower Bound' and 'Upper Bound'
to Zero(0)
 Now initialize a integer data as mid which will be taken as the middle element of
 the given database
 And if the middle value of the data base is equal to the searching value, then th
e program will let us know the position for the searching value.
Available at Location : 3
Saving session...
...copying shared history...
...saving history...truncating history files...
```

Figure 4: Executing of Binary Search Algorithm with its steps

Chapter 3

Conclusion

In this project we are going to use Data Structure Logical formula for building the whole project. We will use as much as many logical formulas that have been used for learning data structure.

Chapter 4

References

[1] Author Initial. Author Surname, Title. City: Publisher, Year Published, p. Pages Used.

[2] A. Rezi and M. Allam, “Techniques in array processing by means of transformations”, in Control and Dynamic Systems, Vol. 69, Multidemsional Systems, C. T. Leondes, Ed. San Diego: Academic Press, 1995, pp. 133-180.

[3] O. B. R. Strimpel, “Computer graphics”, in McGraw-Hill Encyclopedia of Science and Technology, 8th ed., Vol. 4. New York: McGraw-Hill, 1997, pp. 279-283.

[4] K. Schwalbe, Information Technology Project Management, 3rd ed. Boston: Course Technology, 2004