**ATILIM UNIVERSITY**

**DEPARTMENT OF COMPUTER ENGINEERING**

**COMPE 226 – DATA STRUCTURES**

**HOMEWORK I**

**Instructors:** Çiğdem Turhan – Zuhal Kurt

**Due Date:** March 16, 2022 **(by midnight)**

Write a C++ program to create a question bank for a data structures course that includes the following:

* A linked list structure which stores a True-False question and its answer as well as the question number in each node.

no:2

question: “…”

answer:’..’

no:1

question: “Head points to the first node.”

answer:’T’

* A 5-element array which stores the questions of 5 different topics of data structures. Each element of the array holds the name of the topic and the linked list containing the questions & answers of that topic.

|  |  |
| --- | --- |
| 0 | Topic=”LinkedList”  questions |
| 1 |  |
| … |  |
|  |  |
| 4 |  |

* Read the topic names and the question & answers related to that topic from a text file (“Hw1TextFile.txt” is given on Moodle). There are 5 topics, and an unknown number of question & answers ending with # for each topic, as shown below:

|  |
| --- |
| Linked List  Head points to the first node.  T  A node of a linked list includes two pointers as members.  F  The link of a node with no successor is set to NULL.  T  A linked list is a static data structure.  F  A doubly linked list can be traversed in a single direction.  T  #  Stack  Stack is a FIFO structure.  F  Stacks can be implemented with linked lists.  T  … |

* After the array has been inputted, do the following:
  + Randomly (using random number generation), select 2 questions from each topic and prepare a quiz. Make sure that you do not ask the same question twice.
  + After the user answers the quiz, display his/her score and the questions he/she got wrong (you can use another linked list for this purpose) as shown in the sample run below.

***Sample Run:***

Data Structures Quiz

Answer the following:

Linked List questions

1. The link of a node with no successor is set to NULL. (T/F): **T**
2. A linked list is a static data structure. (T/F): **F**

Stack Questions

1. Stack is a FIFO structure. (T/F): **T**

…

Your score: 7/20

Incorrectly answered questions:

A linked list is a static data structure. Correct answer: False

Stack is a FIFO structure. Correct answer: False

…

**Notes:**

1. Do not forget to upload your homework on Moodle.
2. Use the Linked list header file and Hw1TextFile.txt provided on Moodle.