You may be asked to demonstrate/explain your work to the tutor, if you are absent/unavailable or fail to demonstrate properly, zero marks will be awarded.

Text book: Deitel, H M & Deitel, P J 2013, C: How to program, 7th edn, Pearson Prentice-Hall, Upper Saddle River, New Jersey.

Lab 3

1. Write a complete C program that inserts 10 random integers between 0 and 50 **in order** in a linked list. Create a separate function to calculate the floating-point average of the elements. You must use a self-referential structure to create the linked list for this program.

2. Write a statement or set of statements to accomplish each of the following. Use functions wherever necessary.

Use the following structure definition to answer questions 2.a.b.c.d and e

```
struct personal{
      char studentName[20];
      int studentId;
};

struct course{
      char courseName[20];
      int courseId;
};

struct student{
      struct personal studentInfo;
      struct course courseInfo;
      struct student *nextPtr;
};

typedef struct student Student;
typedef Student *StudentPtr;
```

a. Write C codes to create LinkedList that contains one student node. The program should read the values for the *studentName*, *courseName*, *studentId* and *courseId* from a text file.The next pointer to be assigned NULL as the value.

b. Write C codes to create and print a Linked List of 10 students (details read from a text file). Student nodes in the Linked List to be sorted based on the *studentId*.

c. Write C code to write the student list on to a text file.

d. Write C code to read a student name. Search for the student name in the list and if found, delete the node from the list.

e. Write C code to read a student name. Search for the student name in the list and if found, allow the user to edit the *studentId*. (Ensure the new ID is between 1 – 100). Reposition the student node based on the new *studentId*.