

Department of Computer Engineering

University of Peradeniya

Lab 09

Programming Methodology

April 19, 2017

1 Introduction

Linked structures are extremely useful in computer programs because of their advantages over arrays in specific applications. While the access time of arrays are smaller compared to linked list, the update and delete time of linked lists are typically better than arrays. Since linked lists are allocating memory dynamically, the programmer does not need to estimate the final size of linked list like arrays. Linked structures are efficient in storing dynamic content in memory.

2 During the lab

During the lab you should implement a linked list that would store words from a text file. The program should read the file word by word and then store the words along with word length. Finally the output of the program should be the list of words sorted by the word length in descending order. If two words contains same number of characters, first appeared word in the text file should be printed.

2.1 Instructions

- Decide the fields of the structure you are going to use in the lab and declare one using *struct* and *typedef*
- Read the file word by word.
- Implement the insert functionality to the linked list. Make sure you copy the word into the corresponding node of the linked list.
- Implement linked list traversal. Print each word again and make sure you can store all the words inside the linked list.
- Improve the linked list such that it can store the word length along with the word within the node.
- Implement an algorithm to either sort the linked list OR to print the longest word in the list (then omit the node next time by deleting the node completely or updating the word length).
- Make sure your program works according to the given criteria.

3 Submission

Submit a single .c file. Rename it as **14xxxlab09.c** where xxx is your registration number.

4 Important

Make sure that you understand linked list implementation 100% during the lab. This lab is really important to successfully finish your project 2. If you do not understand any concepts, make sure you get help from your partner or instructors.

5 Deadline

The deadline for the submission is Saturday (22) 18:00h.