Assignment 3 – Singly Linked List (2 weeks)

Problem 1. Write a program to manage singly linked lists of integers p, p1 and p2 containing the following functionalities:

a) Add a node at the beginning of p.

b) Add a node at the end of p.

c) Delete the first node from p.

d) Delete the last node from p.

e) Print out p.

f) Count the number of nodes of p.

g) Search for a given value.

h) Search for a given position.

i) Delete a node from p at position n.

j) Insert into p a node at position n.

l) Append p2 to the end of p1.

k) Merge two sorted singly linked lists p1 and p2 into a sorted list.

Problem 2. A set is a list of elements, in which the order of elements is not important. We want to define a data structure for a set of integers and operations on it. Suppose that each set element appears exactly once. Write a program to to define set of integers using singly linked list. The program consists of the following functions:

a) isset(s): checks if s is a set or not.

b) subset(s1, s2): checks if set s1 is a subset of set s2.

c) union(s1, s2): returns the union of two sets s1 and s2.

d) intersection(s1, s2): returns the intersection of two sets s1 and s2.