NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

SC1007 Data Structures and Algorithms **2021/22 Semester 2**

Tutorial 1: Linked Lists

School of Computer Science and Engineering *Nanyang Technological University*

Q1 You are given the following structure definitions and variable declarations,

```
struct person{
  char firstName[15];
  char lastName[15];
  struct{
     int age;
     float height;
     float weight;
     char firstName[15];
     }Info,*InfoPtr;
  struct person personP;
  }student1;
typedef struct person person_t;
person_t* studentPtr = &student1;
person_t** studentPtrPtr = &studentPtr;
```

a Is there any syntax error?

b Write an expression that can be used to access *age* from *studentPtr*.

c Write an expression that can be used to access *age* from *studentPtrPtr*.

Q2 Rewrite insertNode(ListNode **ptrHead, int i, int item) given in the lecture by using a recursive approach.

Q3 We assign the link of the last node to the first node instead of assigning it to a null value. This turns the linked list into a circular linked list. Let *Aptr* and *Bptr* point to any two nodes in the linked list. What is the outcome of the following functions?

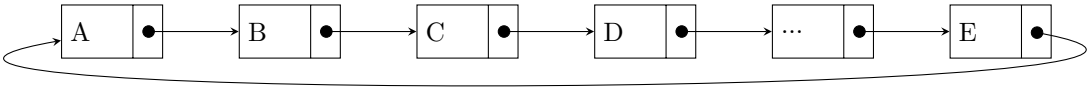

Figure 1.1: A Circular Linked List

```
typedef struct node{
     int item;
     struct node next;
     }ListNode;

void Q3F1(ListNode *Aptr, ListNode *Bptr)
{
  Q3F2(Aptr, Bptr);
  Q3F2(Bptr, Aptr);
}
void Q3F2(ListNode *s, ListNode *q)
{
    ListNode *temp = s;

    while(temp->next != q) temp = temp->next;
    temp->next = s;
}
```