TUTORIAL 4

1. Mark the following statements as true or false.

a. In a linked list, the order of the elements is determined by the order in which the nodes were created to store the elements.

b. In a linked list, memory allocated for the nodes is sequential.

c. A single linked list can be traversed in either direction.

d. In a linked list, nodes are always inserted either at the beginning or the end because a linked link is not a random-access data structure.

2. Describe the two typical components of a single linked list node.

3. What is stored in the link field of the last node of a nonempty single linked list?

4. Suppose that first is a pointer to a linked list. What is stored in first?

5. Suppose that the fourth node of a linked list is to be deleted, and p points to the fourth node? Why do you need a pointer to the third node of the linked list?

Consider the linked list shown in Figure 1. Assume that the nodes are in the usual info-link form. Use this list to answer Exercises 6 through 10. If necessary, declare additional variables. (Assume that list, p, s, A, and B are pointers of type nodeType.)

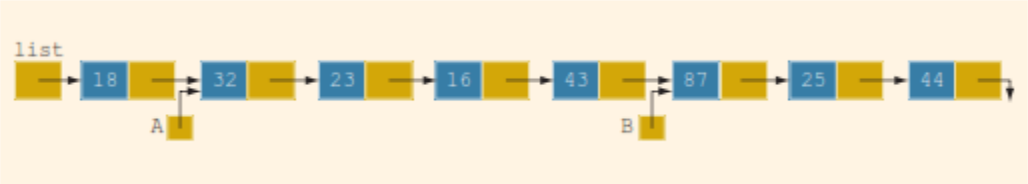

Figure 1

6. What is the output of each of the following C++ statements?
a. cout << list->info;
b. cout << A->info;
c. cout << B->link->info;
d. cout << list->link->link->info;

7. What is the value of each of the following relational expressions?
a. list->info >= 18
b. list->link == A
c. A->link->info == 16
d. B->link == NULL
e. list->info == 18

8. Mark each of the following statements as valid or invalid. If a statement is invalid, explain why.

a. A = B;
b. list->link = A->link;
c. list->link->info = 45;
d. *list = B;
e. *A = *B;
f. B = A->link->info;
g. A->info = B->info;
h. list = B->link->link;
i. B = B->link->link->link;

9. Write C++ statements to do the following.

a. Make A point to the node containing info 23.
b. Make list point to the node containing 16.
c. Make B point to the last node in the list.
d. Make list point to an empty list.
e. Set the value of the node containing 25 to 35.
f. Create and insert the node with info 10 after the node pointed to by A.
g. Delete the node with info 23. Also, deallocate the memory occupied by this node.

10. What is the output of the following C++ code?

```
p = list;
while (p != NULL)
cout << p->info << " ";
p = p->link;
cout << endl
```