Lab 12 Study Questions

1. What is the purpose of a template?

2. Write the code for a templated function called “Swap” that will swap any two items of the same type.

3. What C++ operator does the Swap you created in the previous step rely upon?

4. In Lab 11 we switched the class LNode form Lab 10 into a struct. Why were we able to remove the keyword “public:” from the struct?

5. In the untemplated version of the LNode default constructor we included the line “data = 0;”. Why did we remove that line from the templated version of the constructor?

6. In Lab 11 we added an iterator to our linked list class. What is the purpose of an iterator?

7. The only variable in the iterator is “LNode * current;”. What is stored in this variable?

8. What is the purpose of the function “begin” added to the linked list class? Why does this function return an iterator? What is stored in the iterator returned by this function? Why?

9. What is the purpose of the function “begin” added to the linked list class? What is stored in the iterator returned by this function? Why?

10. How does the iterator returned by “begin” differ from the iterator returned by “rbegin”? Why?

11. How does the iterator returned by “end” differ from the iterator returned by “rend”? Why? What does the ‘r’ stand for?

12. What is the difference between the ++ and the – iterator operators?

13. There are two versions of the increment (++) operator and of the decrement (--) operator. Why? How do they differ from each other?

14. What is the output of the following segment of C++ code? (V is an integer variable.)

```cpp
V = 5;
cout << V << "; ";
cout << ++V << "; ";
cout << V++ << "; ";
cout << V << endl;
```
15. What is the output of the following segment of C++ code? (V is an integer variable.)

```cpp
V = 5;
cout << V << "; ";
cout << --V << "; ";
cout << V-- << "; ";
cout << V << endl;
```

16. What is the output of the following segment of C++ code? (V is an integer variable.)

```cpp
V = 5;
cout << V << "; " << ++V << "; " << V++ << "; " << V << endl;
V = 5;
cout << V << "; " << --V << "; " << V-- << "; " << V << endl;
```

17. Explain the different outputs produced by the 3 previous questions.

18. The post increment (++) operator creates a copy of this iterator and returns the copy. Why?

```cpp
template <class LT>
typename LList2<LT>::Iterator
LList2<LT>::Iterator::operator ++ (int)
{
    Iterator temp = *this;
    current = current->next;
    return temp;
}
```

19. The following C++ code segment will produce an error. Why? (L1 is a linked list containing 5 integer values.)

```cpp
itr = L1.begin();
cout << *--itr << endl;
```

20. The following C++ code segment will produce an error. Why? (L1 is a linked list containing 5 integer values.)

```cpp
itr = L1.end();
cout << *--itr << endl;
```

21. What is the purpose of a dereferencing (*) operator? Why does the operator return an LT type?