

CSCI204/MCS9204/CSCI804

Object and Generic Programming in C++

Laboratory Exercise 8 (Week 9)

Task: generic linked list (1.0)

Define a template class **Node** in a namespace **MyProject** in a file **MyList.h** that consist of 2 data members: A template data object and a pointer *next* of the template Node type. Defined and implement necessary member functions for the class Node in the file **MyList.h** to access the private data members.

Define the template class **MyList** in the namespace **MyProject** in the file **MyList.h**. The class consist of two data members: a template Node pointer *head* points to the head of a linked list, a template Node pointer *tail* points to the back (tail) of a linked list. Define the following member functions for the template class MyList:

- Default constructor.
- Destructor.
- Insert function that takes a template data and insert it into the linked list in the ascending order.
- A print function print out all data stored in the linked list.

Define a class **Stock** in a file **stock.h**. The class consist of three data members: A tag of a stock (which is a char array that can store 4 characters), cost of the stock and volume of the stock. Define necessary member functions, such as default constructor, set functions to set data members' values, , get functions to return the data members' values, and overloading insertion operator to print out a stock's information. Implement the member functions in a file **stock.cpp**.

Write a driver program (include main) in a file **lab8Main.cpp** to test the template classes defined above. The driver program will insert integers in a linked list and print out all the integers. The program will insert some doubles into a linked list and print out all the doubles. The program then get a text file name from the command line arguments, read stock records and insert records into a linked list, then print out all the stock records. You can use random number generator to generate some integers (and) doubles (use random numbers times a double value to make doubles). See the testing for more details.

You can download the stock file **stockdata.txt** from the web site.

Testing

Compile the program by
`g++ lab8Main.cpp stock.cpp`

Run the program like (no extra input needed).

`./a.out stockdata.txt`

`list_i= 5 6 18 20 35 54 76 85 88 98`

`list_d= 3.66667 4 8.71429 12.4 13.125 15.1111 15.519.3333 20.8 32`

`list_s= AAPL 155 747733
ADBE 192 109273
ADSK 100 100342
AKAM 89 347474`

ALTR	87	633346
AMAT	4	646462
BEAS	67	868694
BRCM	89	477442
CDNS	32	244234
CDWC	45	323213
CHKP	98	434242
CSCO	25	232323
CTSH	32	685684
CTXS	89	234234
DELL	16	434322
ERIC	110	928238
GOOG	390	333435
INFY	167	899921
INTC	45	119292
INTU	34	233242
JNPR	13	223234
KLAC	27	222111
LLTC	67	101010
LOGI	130	163633
LRCX	89	119111
MCHP	98	122212
MRVL	32	263632
MSFT	76	232323
MXIM	6	100000
NTAP	34	242341
NVDA	23	654743
ORCL	56	893487
QCOM	21	213457
RIMM	92	442212
SNDK	87	427647
SUNW	67	373272
SYMC	12	235300
TLAB	9	424244
VRSN	12	311233
XLNX	50	323232
YHOO	58	221233

Submission:

You should submit all the files to the server by 11:59 PM on Friday, 25 September 2015 via command:

```
submit -u your-user-name -c CSCI204 -a L8 MyList.h stock.h stock.cpp lab8Main.cpp
```

and input your password.

Make sure that you use the correct file names. The UNIX system is case sensitive. You must submit all files in one *submit* command line.

After submit your assignment successfully, please check your email of confirmation. You should keep this email for the reference.

You would receive ZERO of the marks if your program codes could not be compiled correctly.

Later submission will not be accepted. Submission via e-mail is NOT acceptable.

End of Specification