CS2134 HOMEWORK 6
Fall 2016
Due 5:00 p.m. Wed Oct 26, 2016

Be sure to include your name at the beginning of the file! Assignment 6 includes only a typed portion which should consist of a single file (hw06written) in a .pdf format. Be sure to include your name at the beginning of each file! You must hand in the file via NYU Classes.

Written Part:

1. Draw the conceptual representation for our implementation of a link list (include the header) containing a single item `A`.

2. For each of the following, determine if the code compiles.

```
vector<int> A = {1,2,3,4,5};
vector<int>::iterator vItr1;
vector<int>::iterator vItr2;
list<int> C = {1, 2,3,4,5};
list<int>::iterator lItr1;
list<int>::iterator lItr2;
```

(a)
```
vItr1 = A.begin( );
vItr2 = A.end( );
cout << vItr1 + (vItr1 + vItr2)/2;
```

(b)
```
lItr1 = C.begin( );
lItr2 = find(C.begin(), C.end(), 3);
if ( lItr1 < lItr2 )
   cout << " 2 is not the first item ";
```

3. For each of the following, determine if the iterator is valid.

```
vector<int> A = {1,2,3,4,5};
vector<int> B;
vector<int>::iterator vItr;
list<int> C = {1, 2,3,4,5};
list<int> D;
list<int>::iterator lItr;
```

(a)
```
B = A;
vItr = B.begin();
B.erase(B.begin()+1);
```

(b)
```
B = A;
vItr = B.begin()+2;
B.erase(B.begin()+1);
```

(c)
```
D = C;
lItr = C.begin();
C.erase(++C.begin());
```

(d)
```
 D = C;
lItr = ++D.begin();
++lItr
D.erase(++D.begin());
```

4. Which of the following code snippets are valid? If the code snippet is invalid, state why.

(a)
```
list<int> l;
list<int>::iterator lIter;
l.push_back(200);
lIter = l.begin();
for (int i = 1; i < 100; ++i)
    l.push_front(i);
for (int i = 1; i < 100; ++i)
    l.push_back(-i);
cout << *lIter << endl;
```

(b)
```
list<int> l;
list<int>::iterator lIter1;
list<int>::iterator lIter2;
list<int>::iterator mid;
for (int i = 0; i < 100; ++i)
    l.push_back(i);
lIter1 = l.begin();
lIter2 = l.end();
mid = lIter1 + (lIter2 - lIter1)/2;
cout << *mid << endl;
```

(c)
```
vector<int> v;
vector<int>::iterator vIter1;
vector<int>::iterator vIter2;
vector<int>::iterator mid;
for (int i = 0; i < 100; ++i)
   v.push_back(i);
vIter1 = v.begin();
vIter2 = v.end();
mid = vIter1 + (vIter2 - vIter1)/2;
cout << *mid << endl;
```

5. For the List class, what if the following code for the method remove was used. Would it work correctly? Explain.

```
void remove( const Object & x )
{
    Node * prev = header->next;
    while ( prev != nullptr )
    {
        if ( prev->next->data == x )
            erase_after( iterator(prev) );
        else
            prev = prev->next;
    }
}
```