

## 1 Status

I completed 100% of the lab implementing the Map class without any issues

## 2. Time Complexity

	Time complexity	Storage complexity
<code>Map()</code>	$O(1)$	$O(1)$
iterator <code>find(const key &amp; k)</code>	$O(\log N)$	$O(1)$
<code>value &amp; operator[] (const key &amp; k)</code>	$O(\log N)$	$O(1)$
<code>void erase(const key &amp; k)</code>	$O(\log N)$	$O(1)$

## 3. Source Code

### Map.h

```
#ifndef MAP_H
#define MAP_H
// Map.h

#include "../lab8/Set.h"
#include "Pair.h"

using namespace std;

template < class key, class value >
class Map : public Set < Pair < key, value > >
{
public:
    typedef Set < Pair < key, value > > parent;
    typedef Set_iterator < Pair < key, value > > iterator;

    Map(): parent() {}

    iterator find(const key & k){return parent:: find(Pair<key,value>(k,value()));}
```

```

        value & operator[](const key & k){iterator it = parent::
insert(Pair<key,value>(k,value()));
                                return (*it).second;}

        void erase(const key & k) {parent:: erase(Pair<key,value>(k,value()));}
    };

    // your code goes here

#endif

```

## Pair.h

```

#ifndef PAIR_H
#define PAIR_H

// Pair.h

using namespace std;

template < class T1, class T2 >
class Pair
{
public:
    Pair(): first(), second() {}
    Pair(const T1 & first, const T2 & second): first(first), second(second) { }

    bool operator==(const Pair & rhs) const { return first == rhs.first; }
    bool operator<=(const Pair & rhs) const { return first <= rhs.first; }
    bool operator<(const Pair & rhs) const { return first < rhs.first; }
    bool operator>(const Pair & rhs) const { return first > rhs.first; }

    T1 first;
    T2 second;
};

#endif

```

#### 4. Sample Run

##### Test\_map.cpp

```
Script started on Wed 16 Mar 2016 07:26:38 PM PDT
]0;hau@hau-Lenovo-Y50-70: ~/Desktop/CSE 330/lab10hau@hau-Lenovo-Y50-70:~/Desktop/CSE
330/lab10$ ./a.out
abby -100
billy 6
katie -2
bobby -4
binky 100
charles 0
Success!
]0;hau@hau-Lenovo-Y50-70: ~/Desktop/CSE 330/lab10hau@hau-Lenovo-Y50-70:~/Desktop/CSE
330/lab10$ exit

Script done on Wed 16 Mar 2016 07:26:43 PM PDT
```

##### Test.cpp

```
Script started on Wed 16 Mar 2016 07:30:53 PM PDT
]0;hau@hau-Lenovo-Y50-70: ~/Desktop/CSE 330/lab10hau@hau-Lenovo-Y50-70:~/Desktop/CSE
330/lab10$ g++ T[Ktest.cpp
]0;hau@hau-Lenovo-Y50-70: ~/Desktop/CSE 330/lab10hau@hau-Lenovo-Y50-70:~/Desktop/CSE
330/lab10$ ./a.out
5 7 3
]0;hau@hau-Lenovo-Y50-70: ~/Desktop/CSE 330/lab10hau@hau-Lenovo-Y50-70:~/Desktop/CSE
330/lab10$ exit

Script done on Wed 16 Mar 2016 07:31:04 PM PDT
```