

Final Project Demo

11级 ACM

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Work

- * Finish the given task
- * A few more details

More work

* 小细节的完善

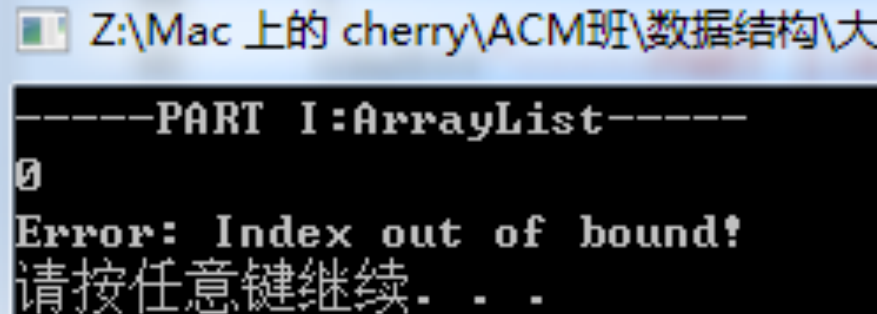
```
class IndexOutOfBounds {  
public:  
    IndexOutOfBounds(std::string msg="Error: Index out of bound!") : msg(msg) {}  
    std::string getMessage() const { return msg; }  
private:  
    std::string msg;  
};
```

```
class ElementNotExist {  
public:  
    ElementNotExist(std::string msg="Error: Element not exist!") : msg(msg) {}  
    std::string getMessage() const { return msg; }  
private:  
    std::string msg;  
};
```

More details

```
try
{
    cout<<"-----PART I:ArrayList-----"<<endl;
    ArrayList<int> a;
    cout<<a.size()<<endl;
    for (int i=1; i<=4; ++i) a.add(i*100);
    for (int i=6; i<=10; ++i) a.add(i*100);
    a.removeIndex(100);

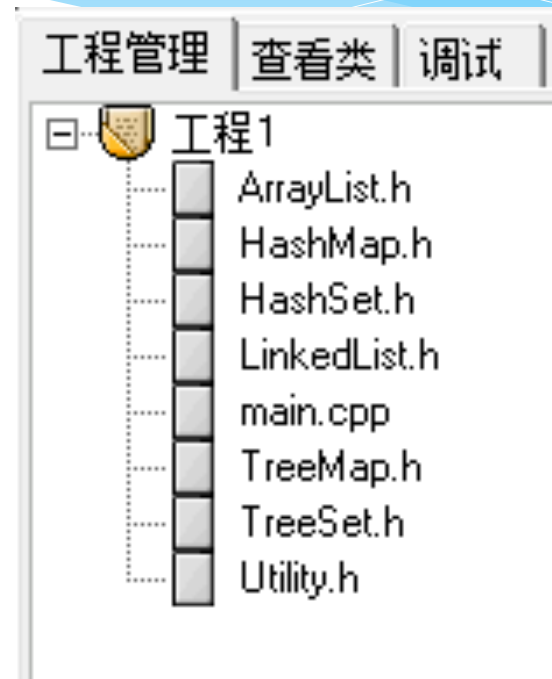
    catch (IndexOutOfBounds ex)
    {
        cout<<ex.getMessage()<<endl;
    }
    catch (ElementNotExist ex2)
    {
        cout<<ex2.getMessage()<<endl;
    }
}
```



```
Z:\Mac 上的 cherry\ACM班\数据结构\大
-----PART I:ArrayList-----
0
Error: Index out of bound!
请按任意键继续. . .
```

Compiling Process

- * Create a project
- * Dev-Cpp



Test

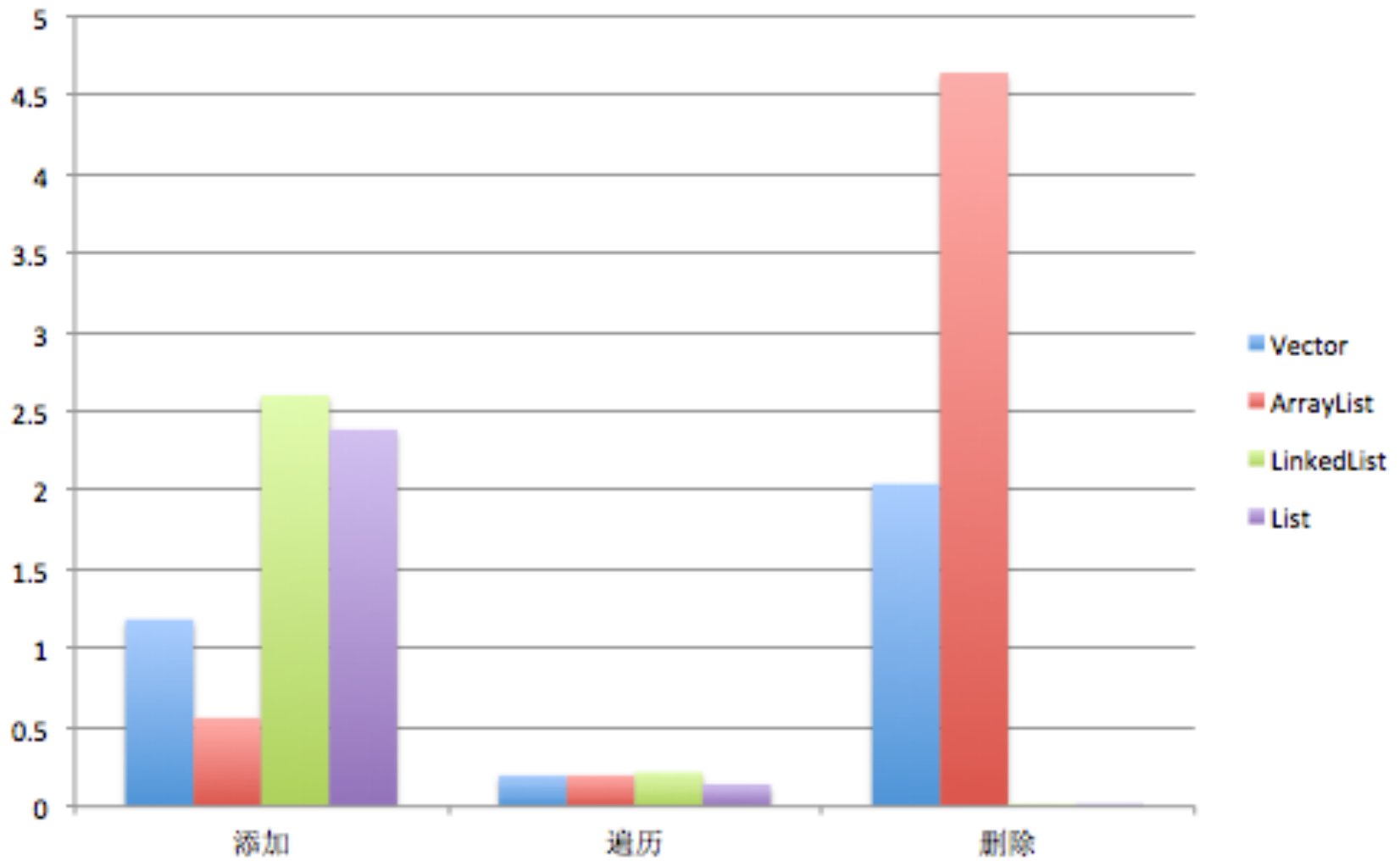
- * Main.cpp by yxc
- * Main2.cpp by cs
- * Random data

```
srand(time(0));  
for (int i=0; i<MaxN; ++i) num[i]=(rand()*1000)+rand();  
multiset<int> tmp;  
tmp.clear();  
for (int i=0; i<MaxN; ++i) tmp.insert(num[i]);  
n=0;  
for (int i=0; i<MaxN; ++i) if (tmp.count(num[i])==1) unum[n++]=num[i];  
  
cout<<clock()/((double)CLOCKS_PER_SEC)<<endl;
```

Test

Operation	Vector	ArrayList	LinkedList	List
添加	1.184	0.561	2.602	2.385
遍历	0.197	0.197	0.218	0.141
查找	—	0.021	0.016	—
删除	2.041	4.643	0.001	0.015

添加操作为加入 9,000,000 个随机元素; 查找为随机查找 100 个元素; 删除为删除 100 次队首元素.

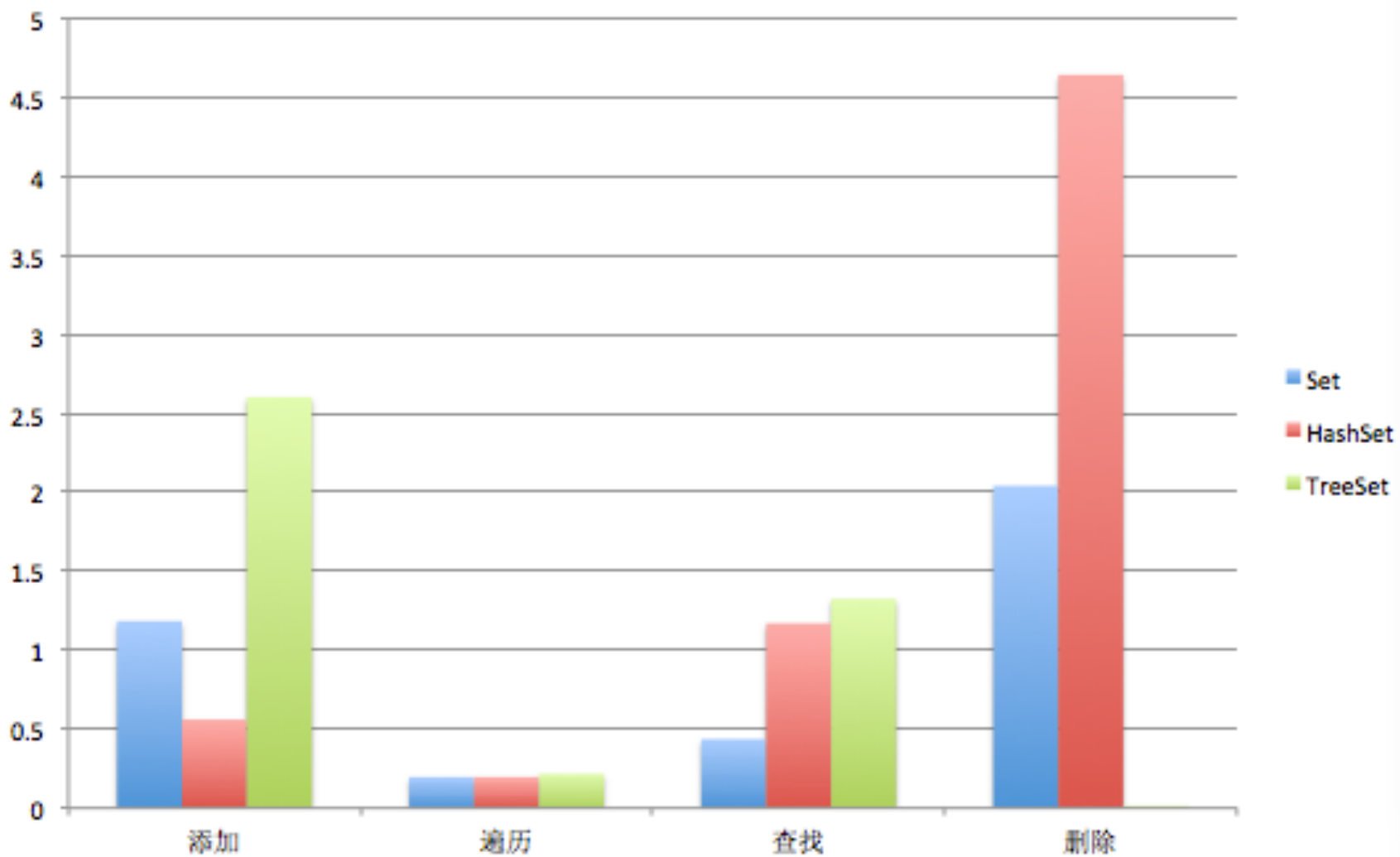


Test

ii. HashSet.h&TreeSet.h

Operation	Set	HashSet	TreeSet
添加	1.482	1.045	2.434
遍历	0.141	0.141	0.452
查找	0.437	1.170	0.250
删除	0.624	1.326	0.140

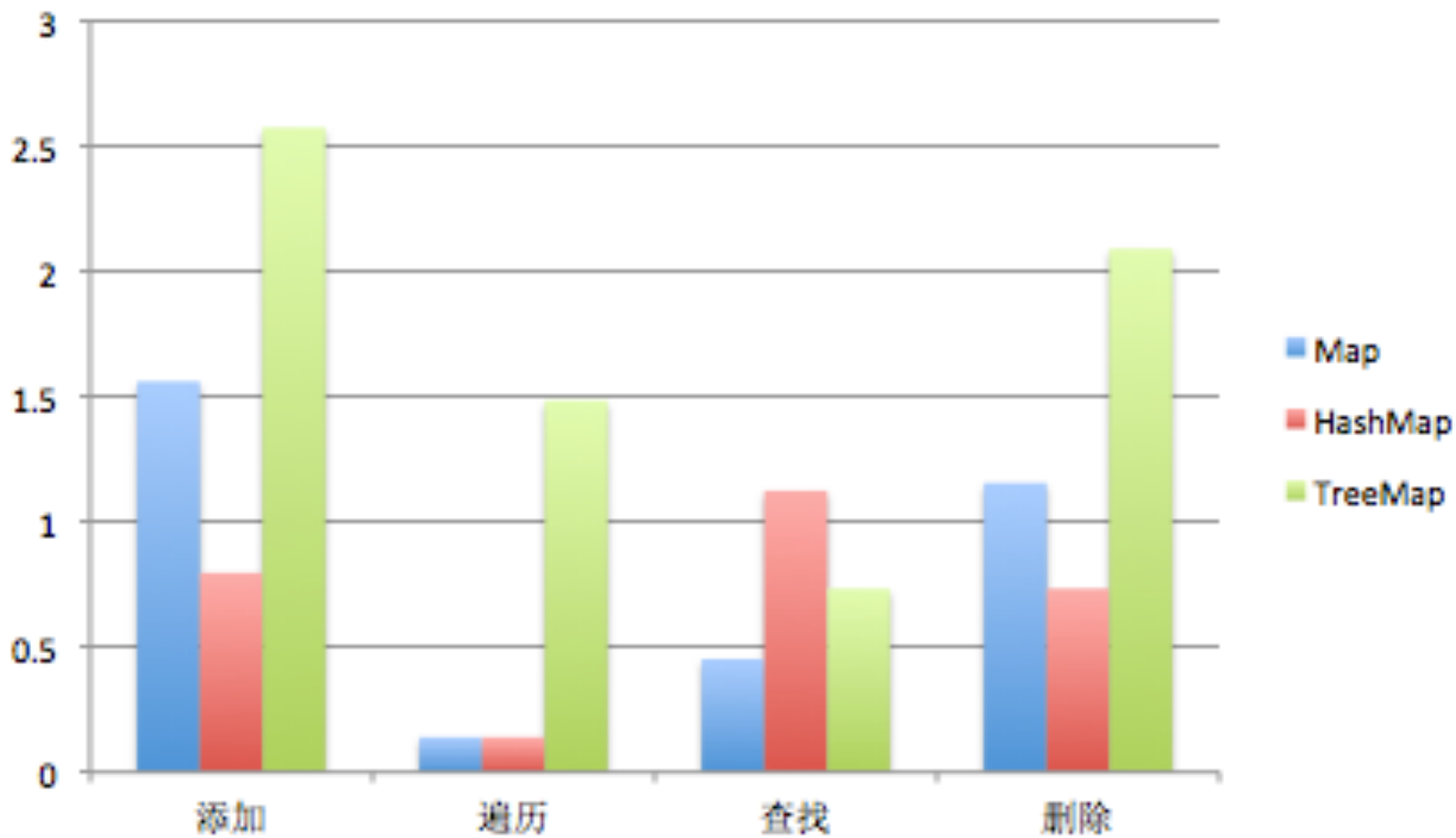
添加, 查找, 删除均为随机操作 1,000,000 次.



Test

Operation	Map	HashMap	TreeMap
添加	1.560	0.796	2.574
遍历	0.140	0.140	0.484
查找	0.452	1.124	0.265
删除	1.155	0.733	2.090

添加，查找均为随机操作 1,000,000 次，删除即将所有元素按插入的顺序依次删除。



Feelings&advice



Thank you 😊

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