# 词典

## 散列：循对象访问

11-A1

We are shaped by our thoughts; we become what we think.

- Buddha

Man's thought is shaped by his tongue.

- Anonymous

于是在熟人中，我们话也少了，我们“眉目传情”，我们“指石相证”，我们抛开了比较间接的象征原料，而求更直接的会意了。

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# 联合数组：更直接、更有效的访问

❖ 数组？再常见不过，比如：

```
fib[0] = 0
fib[1] = 1
fib[2] = 1
fib[3] = 2
fib[4] = 3
fib[5] = 5
fib[6] = 8
...
```

❖ Associative Array

——与此前的数组有何区别？

❖ 根据数据元素的取值，直接访问！

```
style["关羽"] = "云长"
style["张飞"] = "翼德"
style["赵云"] = "子龙"
style["马超"] = "孟起"
```

下标不再是**整数**，甚至没有大小**次序**

——更为直观、便捷

❖ 支持的语言：

Snobol4、MUMPS、SETL、Rexx、AWK、

Java、Python、Perl、Ruby、PHP、

...

## 词条 ~ 映射/词典

❖ entry = (key, value)

❖ Map/Dictionary：词条的集合

- 关键码禁止/允许雷同

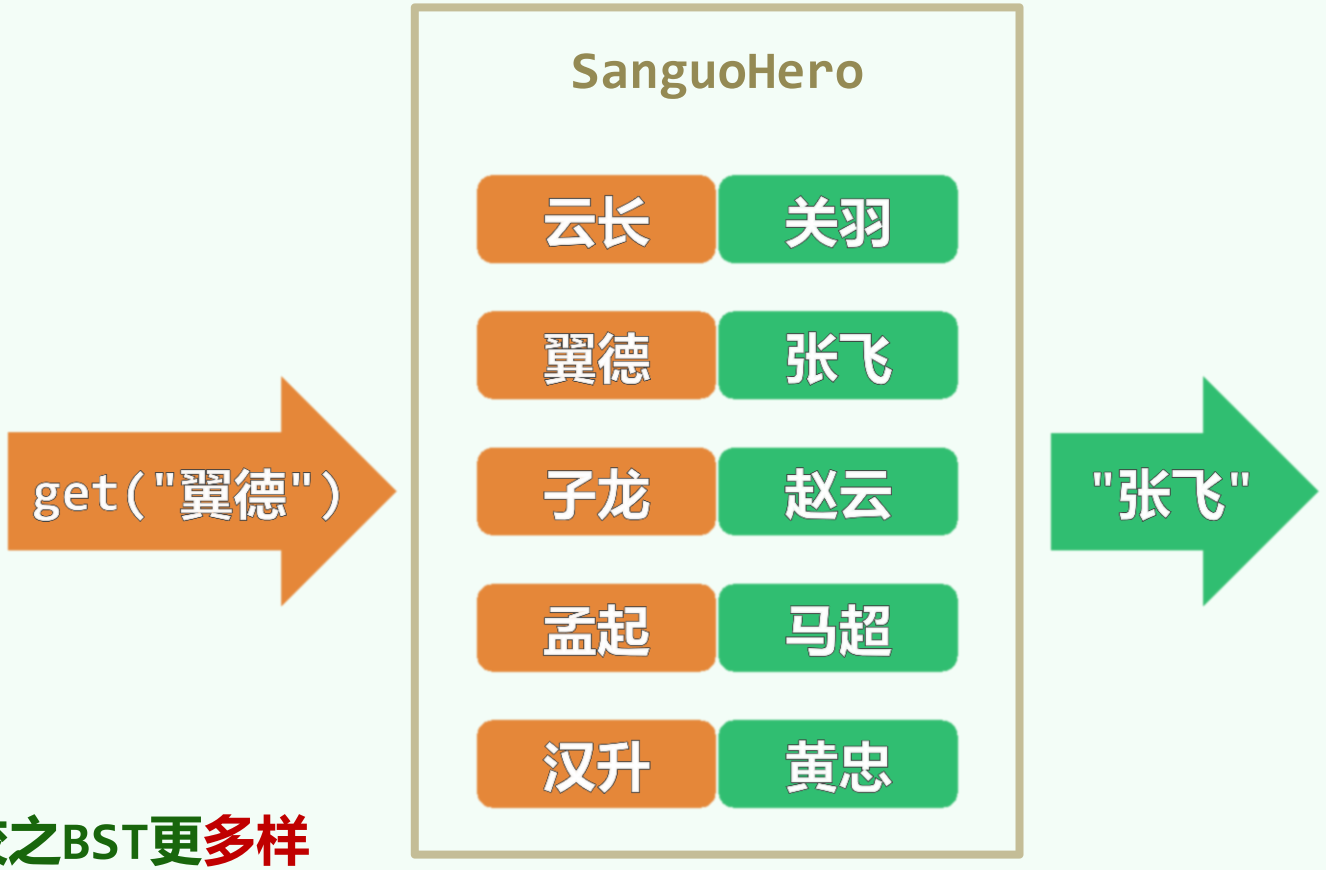
- get(key)

  put(key, value)

  remove(key)

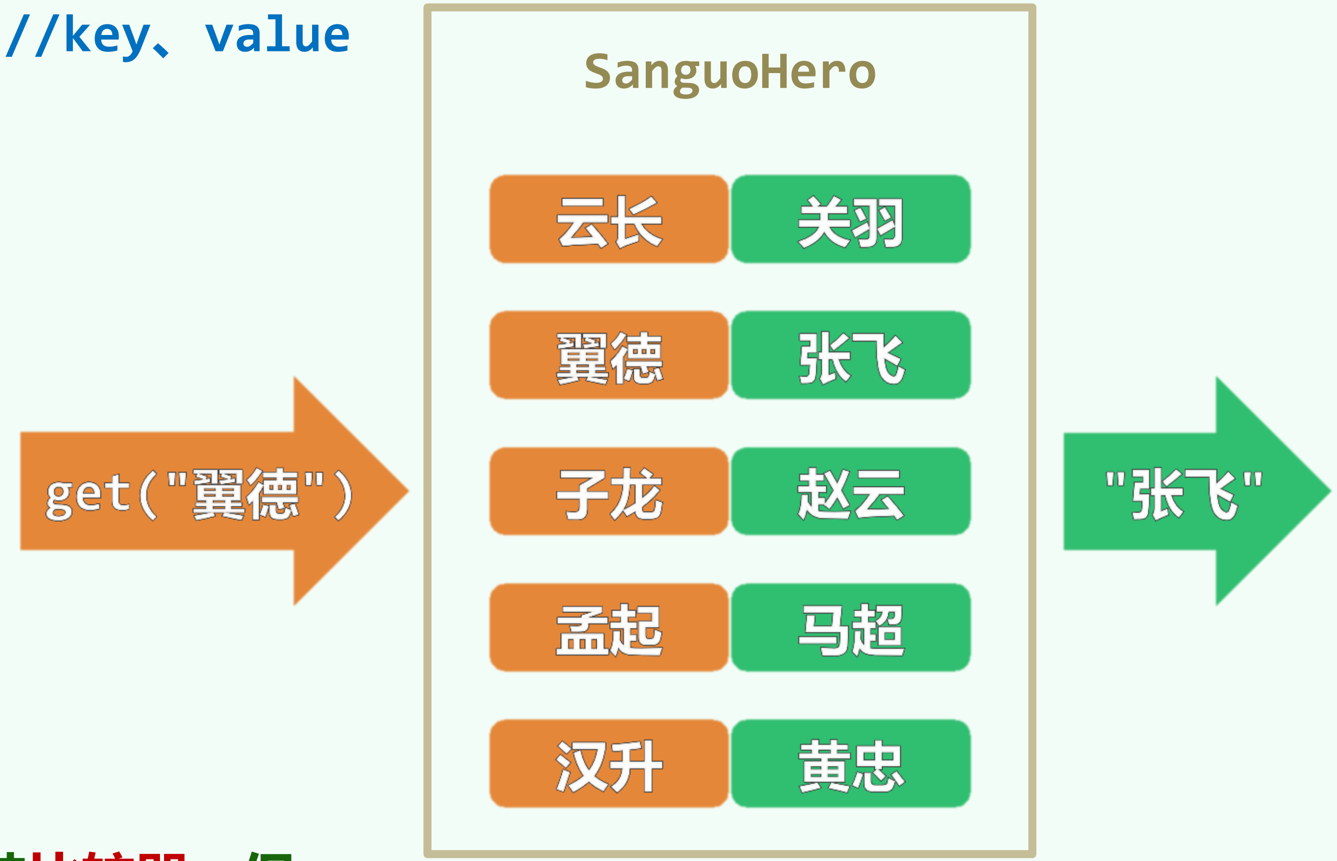
❖ 关键码之间未必可以比较大小，元素类型较之BST更多样

查找对象不限于最大/最小词条，功能较之PQ更通用强大



## Dictionary

```
❖ template <typename K, typename V> //key、value
  struct Dictionary {
     virtual int size() = 0;
     virtual bool put( K, V ) = 0;
     virtual V* get( K ) = 0;
     virtual bool remove( K ) = 0;
  };
```



❖ 尽管诸如Java::TreeMap等实现仍要求支持**比较器**，但实际上词典中的词条，只需支持**比对判等**操作，而不必支持**大小比较**

## Java: HashMap + Hashtable

```
import java.util.*;

public class Hash {

   public static void main(String[] args) {

      HashMap HM = new HashMap(); //Map

         HM.put("东岳", "泰山"); HM.put("西岳", "华山"); HM.put("南岳", "衡山");

         HM.put("北岳", "恒山"); HM.put("中岳", "嵩山"); System.out.println(HM);

      Hashtable HT = new Hashtable(); //Dictionary

         HT.put("东岳", "泰山"); HT.put("西岳", "华山"); HT.put("南岳", "衡山");

         HT.put("北岳", "恒山"); HT.put("中岳", "嵩山"); System.out.println(HT);

   }

}
```

# Perl: %Hash Type

❖由字符串（string）标识的一组无序标量（scalar） //亦即MAP

```
❖my %hero = ("云长"=>"关羽", "翼德"=>"张飞", "子龙"=>"赵云", "孟起"=>"马超");
  foreach $style (keys %hero) # Hash类型的变量由%引导
    { print "$style => $hero{$style}\n"; }
❖$hero{"汉升"} = "黄忠";
  foreach $style (keys %hero)
    { print "$style => $hero{$style}\n"; }
  foreach $style (reverse sort keys %hero)
    { print "$style => $hero{$style}\n"; }
```

## Python: Dictionary Class

```
❖ beauty = dict # Python dictionary (hashtable)
    ( { "沉鱼":"西施", "落雁":"昭君", "闭月":"貂蝉", "羞花":"玉环" } )
  print beauty

❖ beauty["红颜"] = "圆圆"
  print beauty

❖for alias, name in beauty.items():
    print alias, ":", name

❖for alias, name in sorted(beauty.items()):
    print alias, ":", name

❖for alias in sorted(beauty.keys(), reverse = True):
    print alias, ":", beauty[alias]
```

## Ruby: Hash Table

```
scarborough = { # declare and initialize a hash table
   "P"=>"parsley", "S"=>"sage", "R"=>"rosemary", "T"=>"thyme"
}
puts scarborough # output the hash table
for k in scarborough.keys # output hash table items
   puts k + "=>" + scarborough[k] # 1-by-1
end
for k in scarborough.keys.sort # output hash table items
   puts k + "=>" + scarborough[k] # 1-by-1 in order
end
```